1991 INVESTIGATIONS AT FORT GIBRALTAR I:

THE FORKS PUBLIC ARCHAEOLOGY PROJECT

by

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ABSTRACT

During the summer of 1991, funding from Canadian Parks Service, The Forks Renewal Corporation and Historic Resources Branch of Manitoba Culture, Heritage and Citizenship enabled the implementation of a 12-week Public Archaeology Program. The program provided a hands-on archaeological experience for more than 645 individuals, through general public participation and school program components. The cumulative number of visitors to the project over the three years of operation has reached 100,000.

The 1991 project was again conducted by a staff of professional archaeologists, assisted by a participant coordinator and two tour guides. A ratio of two participants for each professional was maintained, both in the excavation component and the laboratory component. This ratio resulted in close supervision and the maintenance of professional standards. The enthusiasm and intense concentration displayed by the participants resulted in work of very high quality.

The excavation was a continuation of the 1989 and 1990 projects conducted at The Forks National Historic Site. The 1991 project continued to uncover further evidence of the major events that occurred in this area. The major natural event, the flood of 1826, was identified in the soil stratigraphy. Four cultural events, documented by stratigraphy and recovered artifacts, were the Railway Period (1888–1988), the construction of the B&B Building (1888–1889), the Hudson's Bay Company Experimental Farm (1836–1848) and the Fort Gibraltar I Period (1810–1816). Structural remains of buildings of the fur trade post were recorded. Evidence was recovered which suggests that the location was occupied prior to the construction of Fort Gibraltar I.

More than 25,000 artifacts were recovered, catalogued and analyzed. The artifacts consist of material from recent railroad operations to trade items and faunal remains from the first North West Company fur trade post at The Forks.

The continuing enthusiasm of the public, both as participants and as observers, makes it imperative that this project be continued under the leadership of The Forks Public Archaeology Association.

GOALS AND OBJECTIVES

The 1991 Public Archaeology Project had two distinct foci, each with its own specific goals and objectives. The primary focus was the continuation of archaeological research in order to obtain additional data regarding Fort Gibraltar I (1810–1816)—the structures and the people who lived in them. In addition, the project was envisioned as an interpretation vehicle, wherein members of the public and the school system could participate in the *hows* and the *whys* of archaeology. The secondary focus, that of public education, was carried out in conjunction with the archaeological research program and in such a manner that the scientific integrity of the research was not affected.

The goals of the research component of the project were:

1. to obtain artifactual and stratigraphic evidence that would provide detailed evidence concerning the buildings and/or palisades of Fort Gibraltar I, in order to accurately determine the location of the fort and its internal design;
2. to obtain data that would help clarify the complex soil stratigraphy at the site and correlate the soil levels and riverine deposition sequences observed in 1984, 1989, and 1990;
3. to correlate artifact recoveries with those from 1984, 1989, and 1990 in order to develop a more complete picture of the activities which occurred at Fort Gibraltar I;
4. to further investigate features which had been recorded during the 1989 and 1990 projects;
5. to obtain further data concerning the events that had occurred in the area, before, and after the establishment of Fort Gibraltar I (A.D. 1810);
6. to facilitate interdisciplinary investigations into the natural history of The Forks.

The goals of the public component of the program were:

1. to fulfill the public mandate of historic interpretation at The Forks for the community and visitors;
2. to demonstrate the role of archaeological fieldwork in the recovery and interpretation of heritage resources at The Forks;
3. to provide hands-on experience for interested members of the public who wished to participate in archaeological studies under the supervision of professional researchers;
4. to obtain tangible historical evidence that The Forks was used as a meeting place and to provide a link between the past, present and future;
5. to make the public aware of the significance of The Forks and its *in situ* archaeological resources;
6. to provide an opportunity for school groups to use the archaeology project as part of their social science curriculum;
7. to determine the appropriate mechanisms for future public archaeological programming at the site;
8. to involve the community-at-large in heritage programming at the site;
9. to help make downtown Winnipeg a focus of attention for residents and visitors.

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Last, but definitely not least, the staff of the 1991 Forks Public Archaeology Project wish to thank the enthusiastic participants and the interested members of the public who made this a most rewarding archaeological experience.

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1.0 INTRODUCTION

The implementation of a large-scale participatory public archaeology program at The Forks in 1989 was a unique project for Manitoba. Various types of public archaeology programs occur throughout the world. Most are predominately observatory, wherein members of the public are encouraged to watch professional archaeologists at work, while others are participatory. Many of the participatory projects have qualification requirements. In addition to charging a considerable fee, they often require a minimum commitment of one week. These projects are located in the United States, England, and Israel as well as other countries.

The Public Archaeology Project, conducted in 1989, 1990, and 1991 at The Forks National Historic Site in Winnipeg, has maintained a seven-day cycle. Each of the two components, participatory and observatory, was operated on an independent, over-lapping schedule. The participatory program operated five days per week (Thursday through Monday). This format was chosen to (1) increase accessibility of the program for those individuals who work the standard week, and (2) provide a view of "archaeology-in-action" for the increased number of weekend visitors.

The observatory program was maintained on a seven-day schedule by staggering the Site Interpreters' work week. One of the interpreters was present at the site during the two mid-week days when the participatory program was not occurring. In addition, their work day continued into the early evening to accommodate visitors who attended the site after the excavations had ceased for the day.

During the three seasons of operation, nearly 100,000 people have visited the project as observers. These visitors have included Canadians from every province and territory, Americans from more than 45 different states and international tourists from at least 60 countries. The hands-on programs have given members of the public and school students the opportunity to participate in the recovery of their history. Special lecture tours have been provided for students and other groups.

The influence of The Forks Public Archaeology Project is obvious. Three public-oriented archaeological projects were undertaken in Manitoba during 1990: the continuation of the Public Program at The Forks, focusing on further recoveries from Fort Gibraltar I (Kroker *et al.* 1991); a project at the Manitoba Glass Works near Beausejour (Spice 1991); and preliminary investigations for a public program focusing on Fur Trade and early Historic sites near Souris (Nieuwhof 1990). The Manitoba Glass Works program was continued in 1991 (D. McLeod 1991:pers. comm.). The demonstrated success of The Forks Public Archaeology program has resulted in a decision by Canadian Parks Service to develop similar public-accessible archaeology projects at Battleford, Saskatchewan and Fort Walsh, Alberta (M. Fay 1991:pers. comm.).

1.1 Planning for the 1991 Project

This year (1991) was the first year that the Public Archaeology Project was under the management of the Board of Directors of The Forks Public Archaeology Association. Under the aegis of the Operations Committee, which met with the 1990 Project Director (Sid Kroker) and representatives of the funding agencies, a workplan and budget for the 1991 project were developed. The details of the planning are discussed more fully in Section 9.

The Operations Committee recommended that the 1991 project be continued at the same location as the 1989 and 1990 projects (Figure 1). This decision was based upon availability of facilities as well as the need to complete excavations begun the previous year.

The 1991 project was funded by three agencies: Canadian Parks Service (CPS), The Forks Renewal Corporation (FRC), and Historic Resources Branch of Manitoba Culture, Heritage and Citizenship (HRB). Details of funding, project organization and project staffing are discussed in Section 9.

1.2 Scope of the 1991 Public Archaeology Program

The first day of public participation was July 11, 1991 and the school program ended on September 27, 1991. Forty days were allocated for general public participation, with an additional thirteen days for school programming. During the program, some adjustments were made, resulting in 36 general public days and two days each for Mini-University and the Young Archaeologists Club (Section 9). A total of 219 individuals and 426 students participated in the hands-on component. An additional 856 students received in-depth lecture programs (Appendix C). Throughout the project, 15,351 people visited the site to observe the operations, to listen to the tour guides, to pick up brochures detailing the project (available in Cree, Saulteaux, French and English) and to talk with professional archaeologists. Although this number is considerably less than the 40,000+ per year who had visited the project during 1989 and 1990, it must be noted that this number is still greater than the optimistic forecast made in 1989 (Kroker, Goundry *et al.* 1990:21). At that time, based on records from other archaeological public projects (e.g., Strathcona Science Centre, Edmonton), 10,000 to 12,000 visitors were expected.

The use pattern of the area has altered due to recent developments at The Forks—continuation of the Riverwalk and completion of the Assiniboine Riverfront Quay. The attraction of these facilities, immediately adjacent to the two rivers, has drawn visitors to the river edge rather than the inland portion of the site. In addition, the lessened number of people per day is consistent with a trend of lessened public visitation noted by other heritage-based organizations—perhaps, in part, due to the current state of the economy.

The 1991 Forks Public Archaeology Project excavations have provided additional data about events that have occurred at this location. Artifacts and contextual data concerning the Railway Period, the construction of the B&B Building, the Immigration Period, the Hudson's Bay Company Experimental Farm and Fort Gibraltar I were obtained. These data have been analyzed in conjunction with the evidence relating to natural events such as the 1826 Flood, and with information retrieved during the 1984 CPS investigations (Priess *et al.* 1986), the 1989 Pilot Public Archaeology Project (Kroker, Greco *et al.* 1990) and the 1990 Public Archaeology Project (Kroker *et al.* 1991).

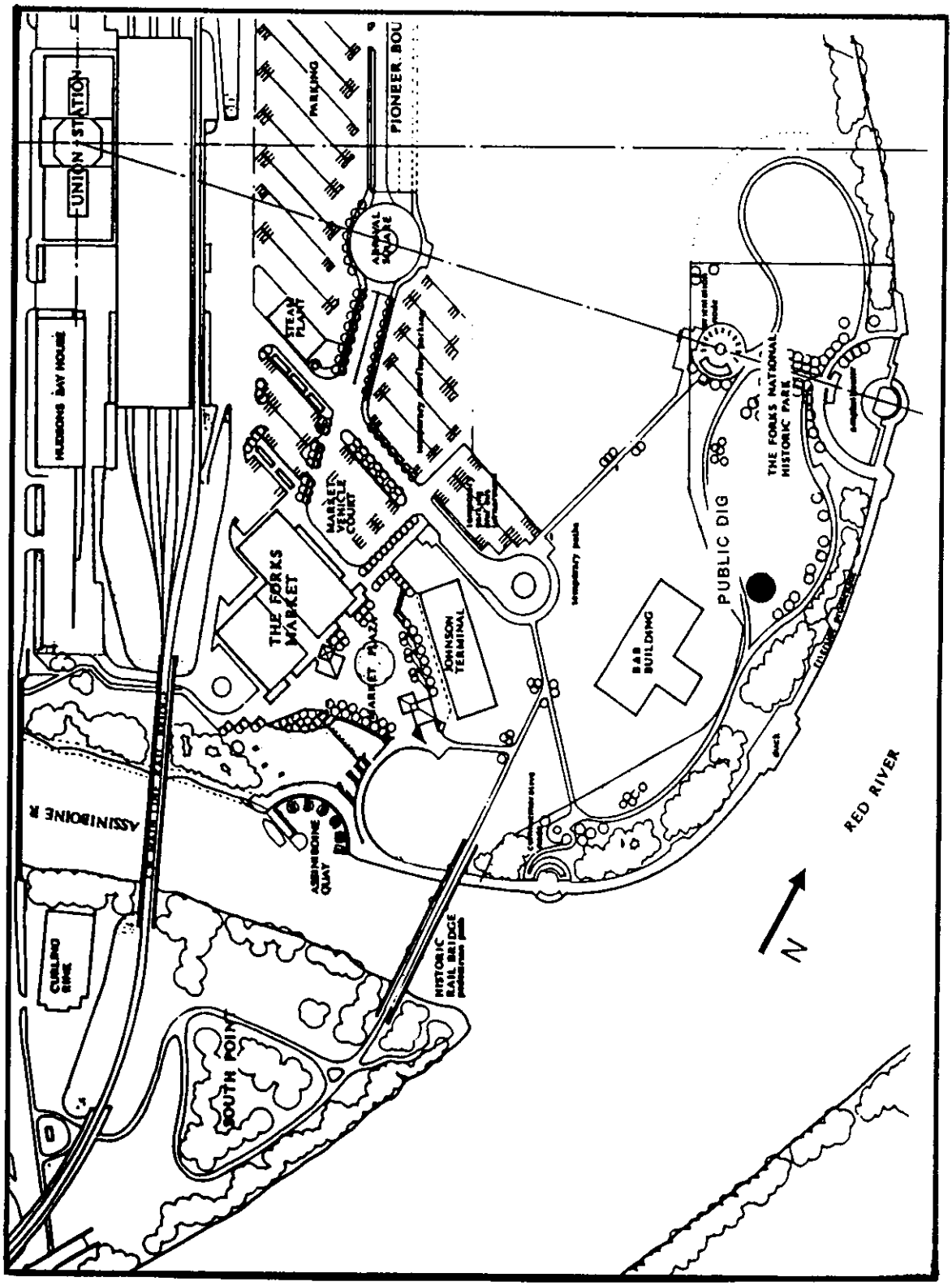


Figure 1: Map of The Forks (Courtesy of The Forks Renewal Corporation)

2.0 HISTORICAL BACKGROUND

The Forks became accessible for archaeological investigation in 1984 (Priess *et al.* 1986) during the planning phases for the creation of The Forks National Historic Site. Numerous archaeological projects have taken place at this site since 1988. Many of these projects resulted from development plans occasioned by the transfer of the East Yard from Canadian National Railway to The Forks Renewal Corporation and Canadian Parks Service. These projects have included impact assessments, mitigative operations, and research-oriented projects as well as the Public Archaeology Program.

This brief overview is presented to enable the reader to place the 1991 discoveries in a chronological framework. For those who are interested in additional reading, the references cited in this section provide a starting point. An extensive list of references can be found in *The Forks Archaeological Impact Assessment and Development Plan* (FRC 1988:Appendix C).

2.1 The First Inhabitants (8000 B.C.–A.D. 1737)

Archaeological investigations at The Forks have yielded information on the earliest period of Manitoba history. Recent work has shown that human occupation of the site area dates as far back as 6000 years ago (Kroker and Goundry 1990). While the quantity of data is still not large, it correlates with and confirms information derived from other parts of the province.

Approximately 9000–10,000 years ago, Glacial Lake Agassiz drained from the Winnipeg area (Fenton *et al.* 1983; Last and Teller 1983; Teller and Thorleifson 1983). The region would have been colonized by both plants and animals and, subsequently, by people utilizing the new food sources. The first occupation of The Forks likely occurred shortly after the lake waters drained into Hudson Bay. The people were bison hunters, who followed the herds into this area from the south and the west (Pettipas and Buchner 1983:444).

The recession of the glacial waters was followed by a long-term warming trend known as the *Altithermal* (or *Hypsithermal*). The Altithermal has been variously dated: 7000–2500 B.C. with the maximum temperatures occurring at 3500 B.C. (Last and Teller 1983); 4000–1000 B.C. with a maximum at about 2000 B.C. (Ritchie 1983:167); and 6000–2000 B.C. with the warmest period about 5200 B.C. (Ashworth and Cvancara 1983; Webb *et al.* 1983:162). The variations in time periods are the result of research in different areas; not all locations experienced the same climatic shifts at the same time.

The Altithermal was characterized by drought conditions, which likely caused the bison herds to abandon the central prairies. With a change in the availability of bison, human populations would have had to rely on a more varied diet of small game, fish and plants. Habitation sites would have been close to permanent sources of water. During construction activities at The Forks, the remnants of two campfires were discovered on the north bank of the Assiniboine River. These campfires, containing charred fish bone, are estimated to be 6000 years old (4000 B.C.) (Kroker and Goundry 1990:162).

By 3000 B.C., groups of people who originally lived to the southeast of Manitoba began to move into The Forks region. This period, from 3000 B.C. to about A.D. 1, is known as the *Archaic* Period. Several groups of people who followed this way of life were visitors to The Forks. A major campsite of this period was discovered in 1988 (Kroker 1989). Other

occupations of the same time period were located in 1989 and 1990 (Kroker and Goundry 1990, n.d.). Further work will be needed to detail the extent of these cultural deposits at The Forks.

Post-A.D. 1, an important technological innovation was introduced into southern Manitoba from the east. A forest-adapted culture in southeastern Manitoba began making ceramic containers, primarily using the coil technique. These containers, distinguished by various decorative markings, have been archaeologically designated as *Laurel* (Manitoba Culture, Heritage and Recreation 1989). Evidence of peoples of this culture has been found throughout the southern Boreal Forest and from the Red River to the Manitoba/Ontario border. In some areas, the Laurel culture lasted until A.D. 1000.

In southern Manitoba, a new pottery manufacturing technique with a different decorative style serves to denote the *Blackduck* culture. Sherds from vessels of this style are the earliest to be recovered at The Forks (Priess *et al.* 1986; Quaternary 1988, 1989, 1990; Kroker 1989; Kroker and Goundry 1990; Adams *et al.* 1990). Several radiocarbon dates have been obtained from charcoal and animal bone associated with these ceramics. These dates, published in the above reports, range from A.D. 510 to A.D. 1450. Current evidence indicates that the Blackduck and subsequent ceramic traditions (Lenius and Olinyk 1990) continued until the advent of the Fur Trade.

Another ceramic tradition, the *Selkirk* tradition, developed in northern Manitoba around A.D. 1000 and expanded southward (McLeod 1987:48). Although the peoples of the Selkirk culture would have used The Forks, they lived primarily to the north and to the east of this area. Several sites in the Red River area have yielded Selkirk ceramics (FRC 1988:39).

Unfortunately, no firm information is available to link groups of the late Pre-Contact period with those groups who were in the area when the first recorded Europeans arrived in 1737. During the period immediately preceding the Fur Trade era, Cree, Ojibwa/Saulteaux, and Assiniboine groups regarded the area of The Forks as their territory.

2.2 Contact Period (1737–1821)

The Forks area was used during the 18th and early 19th centuries by several Native groups, by parties of explorers, by two major fur trading companies, and by independent traders. The visitations were usually temporary; few long-term occupations have been recorded and few descriptive records exist of these occupations.

La Verendrye, invited to The Forks by the Assiniboine nation, was the first known European to visit the area. During his first visit in 1737, two villages of Assiniboine occupied The Forks; in 1738 ten cabins of Cree were present. Fort Rouge was established in 1738 by M. de Louviere, a compatriot of La Verendrye (Guinn 1980a:33). The fort was abandoned by 1749. Disagreement exists as to whether this structure was located on the north bank or the south bank of the Assiniboine River (Coutts 1988:36).

Archival records indicate that the French explorer, Jacques de Saint Pierre, had a winter camp at The Forks in 1752–1753, perhaps at the ruins of Fort Rouge (Coutts 1988:38). Independent Montreal-based traders Bruce and Boyer established a winter camp (1781–1782) in the area. In 1793, McKay reported a camp of Nor'Westers present. Alexander Henry, a partner in the North West Company, reported members of that company made regular use of The Forks area from 1800 to 1808.

By the turn of the 19th century, despite fear of attacks by the Sioux, several Metis families had settled at The Forks. They worked as commercial buffalo hunters for the North West Company (Guinn 1980a:24; Coutts 1988:8).

2.2.1 Fort Gibraltar I (1810–1816)

Due to the fact that The Forks was becoming an important transfer point for the North West Company after 1800, the company appears to have had a semi-permanent presence at the junction of the Red and Assiniboine rivers. The cargos of trade goods from Montreal were broken into smaller shipments for transport to the inland posts, while the bales of fur, obtained by the wintering partners, were combined for shipment to the east.

Alexander Henry visited the location on numerous occasions and Louis Dorion over-wintered during 1803–1804 (Coutts 1988:76–77). During the summer of 1810, John Willis, a *bourgeois* with the North West Company began building Fort Gibraltar at The Forks as a central post to handle the transfer of goods and furs. In addition, Fort Gibraltar become the focal point of the pemmican industry, with supplies being brought here, stockpiled and then transported to the smaller posts.

The post, constructed with the assistance of craftsmen from the local Metis community, was finished by the following winter. One of the workers, Jean Baptiste Roi, described the establishment.

> *It was a wooden picketing, made of oak trees split in two, which formed its enclose. Within the said enclosure were built the house of the partner, 2 houses for the men, a store, two hangards or stores, a blacksmith's shop and a stable; there was also an ice-house with a watch-house (guerite) over it; these houses were good log houses, large and inhabited. In the house of the partner were his clerks and interpreters, and in the other house his engage (servants) to the number of eight or ten men; each of the houses could have contained twenty men* (Coutts 1988:79–80).

Another workman, Jean Baptiste Mennie, also provided a description of the fort:

> *We were employed a whole year building. In the winter there were twenty men there who were all employed. The fort was built by one Mr. Willis, who died there and was succeeded by Mr. Duncan Cameron. There were in the fort one house, sixty-four feet long, one of thirty, a kitchen of fifteen feet, another house twenty-eight feet, a store twenty-two feet and other buildings* (Coutts 1988:80).

The first Selkirk Settlers arrived in 1812 and they became caught up in the conflict between the North West Company and the Hudson's Bay Company. The settlers and the HBC employees constructed Fort Douglas (also called the Colony Fort) in 1814. In 1815, the Nor'Westers, after most of the Selkirk Settlers had left for eastern Canada or York Factory, destroyed the largely abandoned HBC establishment. The York Factory contingent of the Selkirk Settlers returned and rebuilt Fort Douglas during the winter of 1815–16. In the spring of 1816, Colin Robertson, Robert Semple and a group of HBC men and settlers, seized Fort Gibraltar. Robertson noted that the fort

> *. . . is certainly in an excellent state of defence; it has two good bastions at the two angles of the Square and the Square is formed with Oak Palisades, eighteen feet in height and these are proof against Musketry. This is not only a strong place but very comfortable lodgings, such as I have not been accustomed to for some time past* (Coutts 1988:81).

In June, "the greater part of the NWCo. House and buildings and stockades were pulled down and conveyed to Fort Douglas" (Guinn 1980a:52). Those parts of Fort Gibraltar that could not be used were burned, so as not to provide resources for the Nor'Westers. After the battle of Seven Oaks, the settlers and the HBC traders were forced to leave the colony and the NWC took possession of Fort Douglas. In January of 1817, the Des Meurons regiment, recruited by Lord Selkirk, captured Fort Douglas and the colonists returned. The conflict resulted in action by the Canadian administration and William Coltman was appointed to investigate. His report called for the restitution of all property and, consequently, the North West Company began the construction of the second Fort Gibraltar at The Forks (Guinn 1980a:54). With the amalgamation of the two companies in 1821, the era of fur trade competition came to an end.

2.3 The Transition Period (1821–1870)

The post-amalgamation period saw further developments to The Forks area. After its take-over by the Hudson's Bay Company, Fort Gibraltar II was renamed Fort Garry. Fort Garry declined in importance when Lower Fort Garry was built in 1832. However, the location of Lower Fort Garry, 30 km down the Red River, was not optimum. In 1835, work began on its replacement, Upper Fort Garry, a limestone-walled structure located to the west of the present FRC property (Loewen and Monks 1986: 23–26). Buildings at the first Fort Garry had suffered serious damage in the major flood of 1826. After further damage during the flood of 1852, the structures were abandoned (Guinn 1980a:87).

During this period, several attempts were made to establish an agricultural base at The Forks site. As early as 1808, Metis had established small farms along the banks of the rivers (Coutts 1988:78-79). In 1836, the Hudson's Bay Company commissioned Captain George Cary to establish an experimental farm for the rearing of "sheep and Black Cattle and for the growth of Flax and Hemp" (Guinn 1980a:68). The area under consideration was the "low ground on each side of the New Establishment at the Forks" (Guinn 1980a:68). The location has been described in an undated document in the Hudson's Bay Company Archives. The area extended

> *. . . from the north bank of the Assiniboine River immediately below George Thane's [lot], North 3° East, one hundred and fifty chains [3017 m], or thereby and then 65° East . . . . to the Red River, from there round the shores of the Red and Assiniboine Rivers to the place of beginning (save and except the ground occupied by or required for Upper Fort Garry. . .)* (Guinn 1980a:178).

Barns and stables were constructed north of the river junction (Warkentin and Ruggles 1970:192–193). By 1838, only 20 acres were cultivated and by 1841 the farm was abandoned. Governor George Simpson reported that

> *The experimental Farm, which has not been productive of the benefits that were expected when it was established although attended with considerable outlay has been abandoned. Mr. Cary and the servants have been permitted to retire* (Guinn 1980a:69).

In 1848, a group of British Army veterans, the Chelsea Pensioners, were granted land adjacent to The Forks area (Coutts 1988:129). From 1858 to 1860, British Army regulars were stationed at Upper Fort Garry. During their stay, both groups may have used the now-abandoned gardens and fields of the Experimental Farm to grow crops for their own consumption.

A number of events occurred in the latter part of this period that would have major ramifications for the future of The Forks. In particular, the disappearance of the bison totally disrupted the lifeways of the Natives and Metis. This eventually led to political action by the Metis and the Confederation of Manitoba within Canada in 1870.

2.4 Industrialization and Immigration Period (1870–1888)

A major increase in immigration to western Canada occurred between 1870 and 1888. In 1872, two *immigration sheds* with detached cookhouses were built near the former location of Fort Gibraltar I. A *shanty town* developed on *the flats* between the west bank of the Red River and the Fort Gibraltar I area. The shanty town disappeared by 1884 and the immigration sheds by 1885 (FRC 1988:50).

Three industrial sites were constructed in The Forks area between 1870 and 1888. Two were Hudson's Bay Company developments. One of these was a warehouse complex (Steamboat Warehouse or Warehouse #4), built on the north bank of the Assiniboine River in 1872. In 1877, the structure was moved 120 feet back from the river and was demolished in 1895. The other company development was a large flour mill complex. The mill was built in 1874 and associated structures (sheds, warehouses) were added until the complex consisted of nine buildings. It was demolished in 1907 (Guinn 1980a:142–3). The Clarke and McLure Lumber Yard, located in the central portion of The Forks, operated from 1876 to 1890.

2.5 The Railway Period (1888–1988)

In 1888, a charter was granted to the Northern Pacific and Manitoba Railroad. That same year, the Hudson's Bay Company sold 20 acres of land to the railway for $10,000 (Guinn 1980a:135). The site of Fort Gibraltar I was located within these 20 acres. This property remained under railway control until the area was transferred to Canadian Parks Service and The Forks Renewal Corporation in 1988.

The Northern Pacific and Manitoba Railroad began construction of two buildings in 1889. A large repair shop and roundhouse were built north of the junction of the Red River (Guinn 1980b:4). The roundhouse was demolished in 1926 but the repair shop, known today as the B&B Building, still stands. This structure is located just to the southwest of the Fort Gibraltar I excavation areas.

For the past century, the railway has been the dominant industry at The Forks. The excavation area has been affected by this railway activity, either as an active area of railroad-related work or as a dumping ground for the by-products of railway activities (cinders, ash and refuse). The use of large quantities of coal-derived cinders as landfill has provided a thick layer (up to two meters), which has served to protect heritage resources from disruption.

3.0 FORT GIBRALTAR I OPERATIONS—1991

3.1 Introduction

Since the 1984 Parks Canada excavation (Priess *et al.* 1986) at the Fort Gibraltar I location, major changes to The Forks area have occurred. There has been considerable landscaping within The Forks National Historic Site. Fences, paths, gardens and interpretive monuments have been erected in the general area of the 1984 archaeological operations. FRC property west of the National Historic Site has remained largely unmodified with only surface clearing, service installations and sodding having occurred since 1988.

3.2 Project Location

From the late 1880s until 1988, the majority of The Forks area had been an active railway yard. Portions of the site had been used as a dumping ground. The railways first used gravel as fill to level the area and raise it above annual flood level. Later, the tonnes of ash and cinders produced by coal-fired locomotives and the steam plant were dispersed throughout the area. The depth of this overburden at the Fort Gibraltar I location was found to range between 1.25 m and 1.50 m.

The first step of the 1989 Fort Gibraltar I archaeological project was to locate the 1984 CPS excavation. The 1989 excavation area was laid out contiguous to the 1984 units (Figure 2) with some overlap occurring to allow for data integration.

At the end of the 1989 field season, the excavation units were protected with plastic and straw bales and refilled with overburden (Kroker, Greco *et al.* 1990). At the start of the 1990 project, the site was re-opened and initial excavation continued in the same units as in 1989. Additional units were also excavated from 57C to 57K and from 58B to 58G (Kroker *et al.* 1991:Figure 6). These units provided an overlap with 1984 units 21K6R and 21K6S. After five weeks of excavation in 1990 it became necessary to expand the site. Fifty-four sub-operations were laid out extending from 54L to 56L and southward nine metres (Kroker *et al.* 1991:Figure 6). This extension also allowed for the exposure of a further two metres westward. The eastern edges of four 1984 CPS units were also uncovered. The procedure for closing the excavation area in 1989 was repeated at the end of the 1990 field season.

3.3 1991 Project Set-up

3.3.1 Excavation Site Preparation

A backhoe with a flat bucket blade was used to remove the material that had been used to refill the 1990 site extension and Feature Q areas. Additional fill was removed along the eastern edge of the 1991 excavation area to allow for the placement of another line of sub-operations (Figure 3). In conjunction with the backhoe, staff removed the protective cover of straw bales and plastic (Figure 4). As in 1990, the units were well preserved by the site protection methods employed. The excavation units were prepared for the 1991 field season by clearing excess soil and straightening the walls with shovels and trowels.

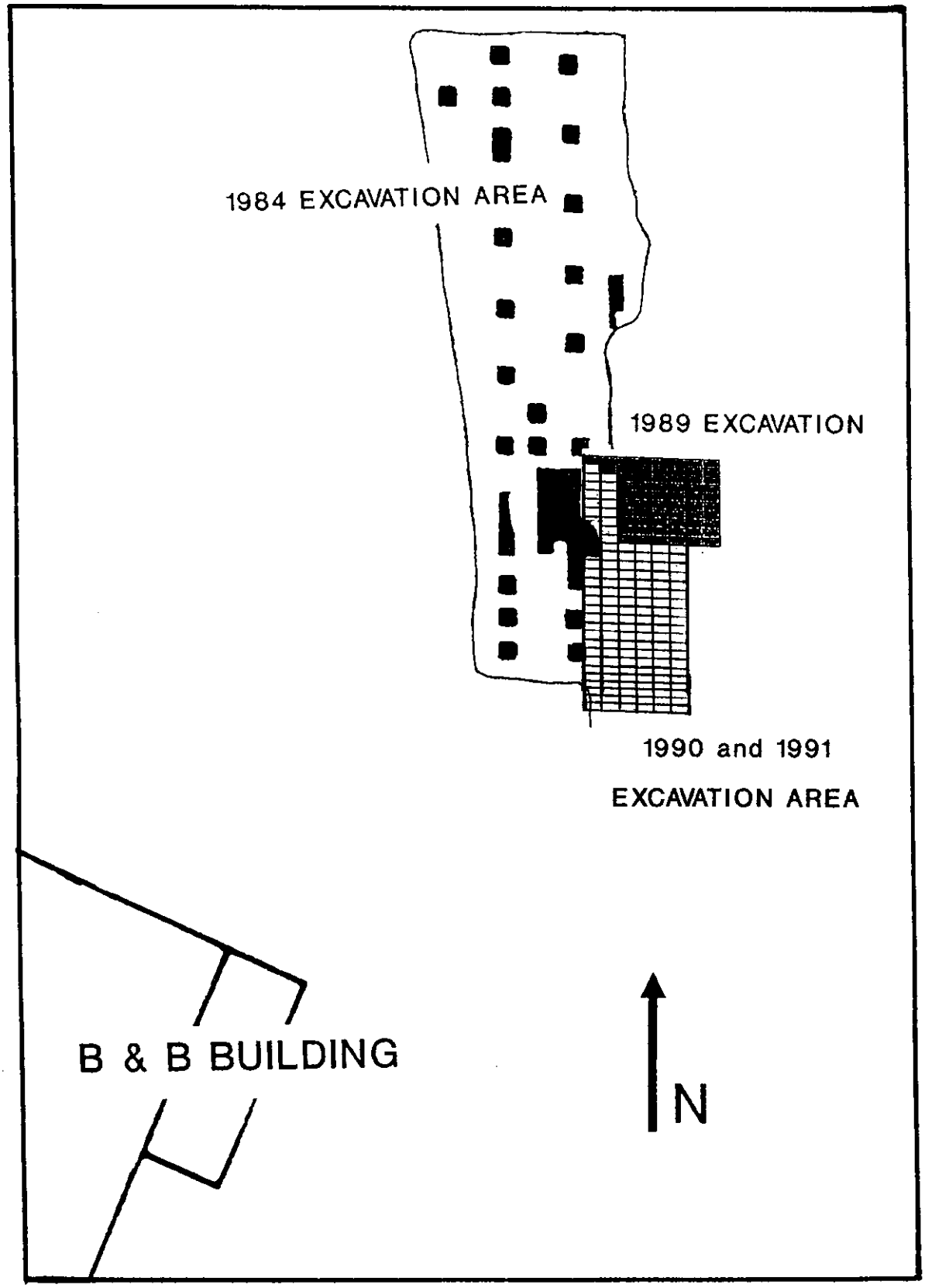


Figure 2: Map of Fort Gibraltar I Excavations

The retaining wall, constructed at the conclusion of the 1990 field season, remained intact from unit 54K to unit 56K. Once some backfill was removed, the wall collapsed where it had angled to protect Feature Q. This made it difficult to determine the exact location of the feature, resulting in the inadvertent removal of the upper soil levels in units 57M to 57Q and in the western portions of units 56N and 56P.

The shoring and re-bar, left in place at the close of the 1990 field season along the east, west and south perimeter of the site, helped to ensure that the walls did not collapse during re-excavation. The shoring had rotted and warped and most of it had to be replaced. Shoring was also placed along the north wall of the excavation. This structure prevented edge materials from falling into the excavation area, especially as the walls dried during the course of the summer. Equally important, the shoring protected individuals from the jagged edges of the cinders, wood and metal scraps protruding from the walls.

Concurrent with the sub-surface preparation of the site, the crew erected a 30 foot x 40 foot, free-standing, Fiesta tent over the excavation area (Figure 5). The tent had been purchased through a grant from the Manitoba Heritage Federation. Feature Q, located in the northwest corner of the excavation, was beyond the area covered by the tent. This area was protected by placing plastic directly on top of the feature and uncovering it when necessary.

Placing a tent over the site was considered vital for several reasons. The site was to be excavated by staff-assisted participants who had registered for short, specific periods of time. Most of the available positions had been booked very early in the project, and it would not always be possible to reallocate individuals to another time slot if weather precluded operations. Thus, participants had to take advantage of their registered times or they would lose the opportunity to participate until the following field season. Also, it was important that no working days be lost due to poor weather. Finally, with the tent covering the site, extreme weather conditions (excessive heat, rain, wind or snow) were less of a problem for all involved.

Since the tent protected the site from the elements, it was unnecessary to uncover and cover the excavation area each day. This allowed the area to be left open for viewing during off hours when no crew were available. The tent and the open excavation area allowed the site interpreters to provide information and tours to visitors who came by when archaeological staff and participants were not present. The tent was closed and secured at the end of each day.

Minor vandalism occurred when an individual(s) entered the south end of the excavation and removed a few large mammal bone fragments which had been left *in situ*. Parts of unit walls in the central portion of the site were also damaged.

The platforms and walkways, constructed in 1989 and left in place over the subsequent two winters, weathered well. The railings were removed from storage and rebolted to this base structure. The viewing platform and the wheelchair-accessible ramp were situated at the northwest corner of the site, at the edge of the main walking trail along the western boundary of the park. A walkway ran along the west side of the excavation, inside the tent. Visitors were encouraged to view the site from these vantage points. Groups that assembled at the open southern end of the tent were asked to come around to the interior walkway. This was important since the southern end of the site was the main entrance to the excavation area and participants required unobstructed access.

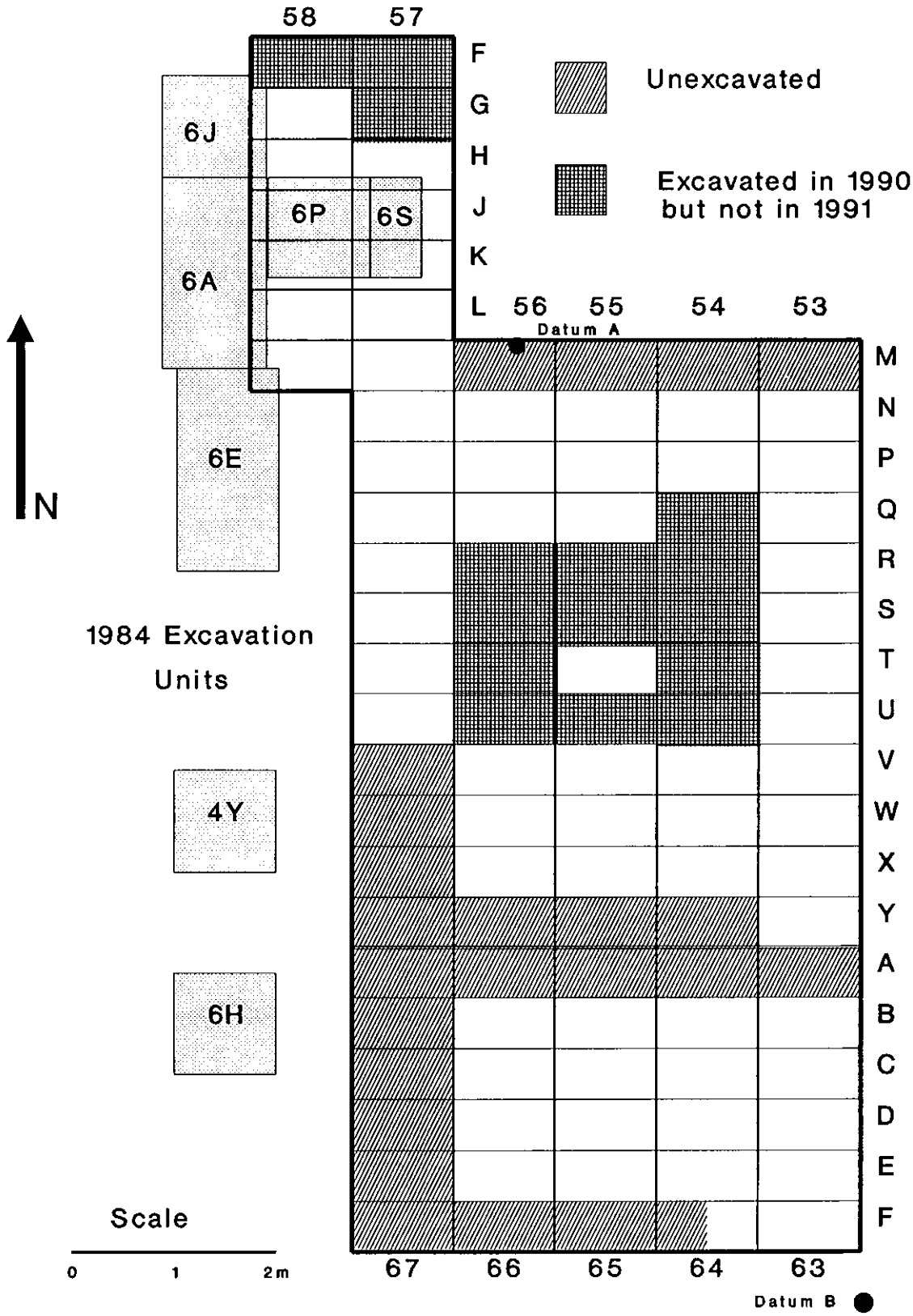


Figure 3: 1991 Excavation Floor Plan

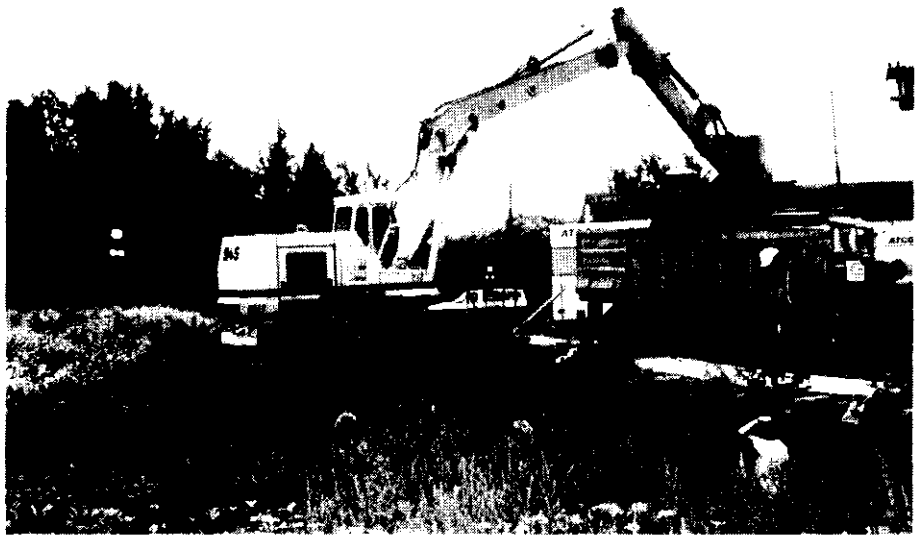


Figure 4: Re-opening the Excavation

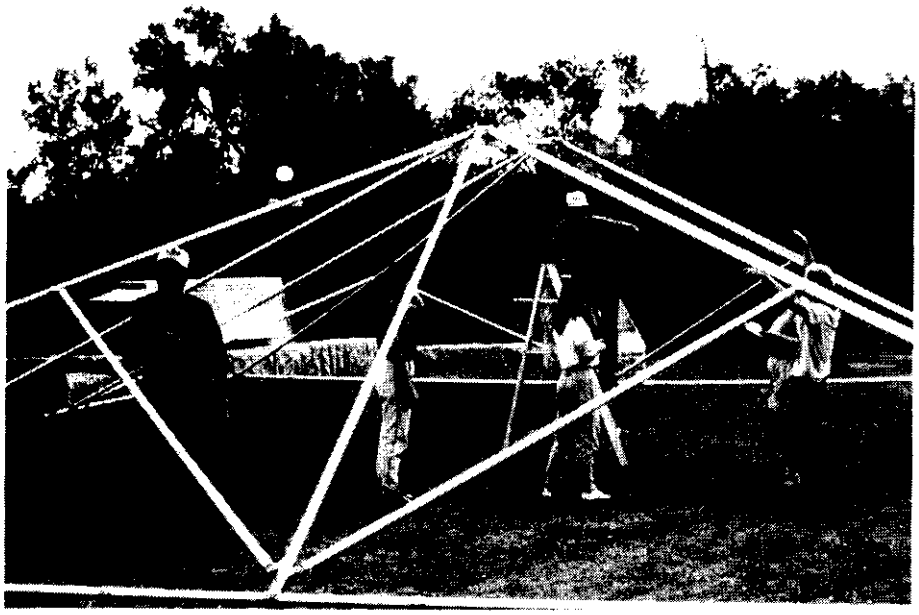


Figure 5: Crew Erecting the Tent

The platform and the interior walkway permitted 40 to 60 visitors to watch the crew at work and allowed the interpretation and excavation staff a much better venue to explain their work. Some visitors spent several hours at various stages of the excavation leaning on the railings of this walkway. Snowfencing was used to completely enclose the excavation perimeter to eliminate any potential hazard for visitors.

The water screening area was reestablished on the old road adjacent to the perimeter of the National Historic Site. Screens, placed in storage at the end of the 1990 field season, were retrieved and cleaned. Wooden pallets were placed on either side of the screens in order to provide an elevated, less muddy surface for participants to stand on while water screening (Figure 6). Water run-off channels were created to direct water away from the screening area and a constant effort was made to keep these channels open.

By using the old road as the water screening area, the wood post and chain fence along the park boundary could be used to separate the visitors from the working personnel. People generally assembled along the fence rather than crowd around the screens. The excavation crew, one of the experienced participants or one of the site interpreters would explain the process of, and reasons for, screening. Recovered artifacts were taken to the visitors rather than having the visitors come to the screens. The fence separation also prevented water from being accidentally sprayed on the visitors.

3.3.2 Laboratory and Kiosk Facilities

Three ATCO trailers were rented and placed within the chain-link fenced compound adjacent to the B&B Building (Figure 7). One 10 foot x 24 foot trailer was used as field equipment storage space as well as a lunch/coffee space for participants and staff.

A second 10 foot x 24 foot trailer was used as the site office of the Participant Coordinator. A portion of this trailer was used as the display section for the Kiosk component of the project. The materials for sale consisted of T-shirts, caps, buttons and publications provided by The Forks Public Archaeology Association and the Manitoba Archaeological Society. The operation of the Kiosk is described in Section 9.

The third trailer (10 foot x 32 foot) housed the laboratory facilities. One room of the lab trailer was used to store artifacts before processing as well as space for the drying racks. The second room consisted of working space for the participants, lab staff, and school groups. The computer was set up in this room for use by the lab staff and the Participant Coordinator. Bookshelves housed an ever-increasing number of references, available for artifact research by staff and participants. A microscope was used for artifact identification and analysis.

As part of the interpretive aspect of the project, a display of artifacts, from previous excavations at The Forks, was situated in the lab trailer. This was popular with the participants as well as with the general public. On some days, the lab was extremely busy with public visitors and considerable interaction between staff, participants, and the visitors occurred. While the field crew could rely on the Site Interpreters to explain the project and the operations, staff and participants fulfilled this role in the lab.

Figure 6: Participants at the Water Screen

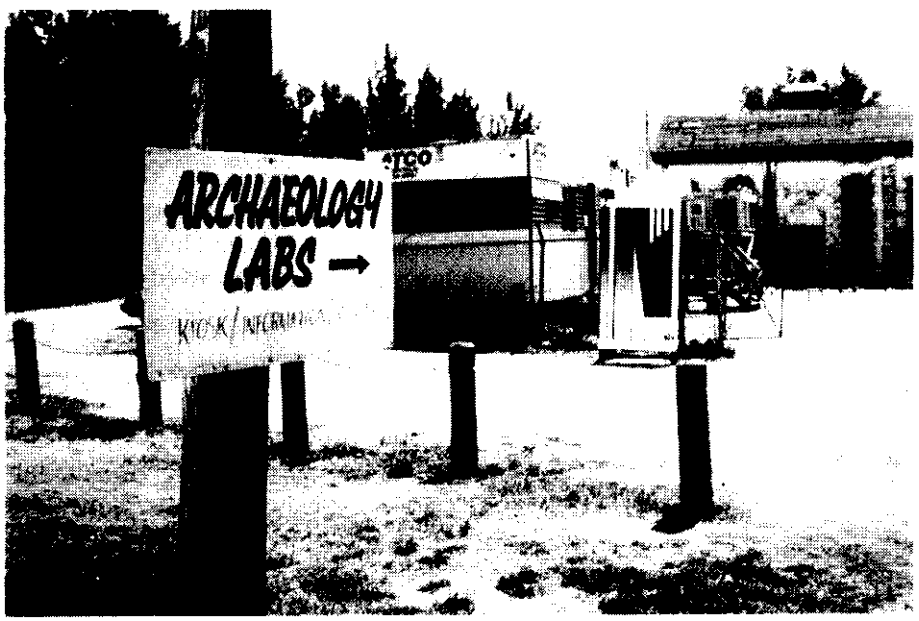


Figure 7: Project Laboratory Facilities in the Compound

3.4 Methodology and Procedures

3.4.1 Excavation Methodology

The archaeological methodology used at The Forks Public Archaeology Project in 1991 followed conventional techniques of data retrieval from a multi-strata site. The site was excavated in natural levels following procedures detailed in the *Parks Canada Archaeology Manual Volume I: Excavation Records System* (Parks Canada 1977). These excavation techniques and procedures allow for a system-wide approach to all archaeological excavations conducted on Canadian Parks Service land or on sites excavated under its direction.

Using this methodology, the excavation area is defined as an *operation*, with individual excavation *units* defined as *sub-operations* within the excavation proper. Sub-divisions of the sub-operation are identified as *lots* and are the smallest divisions within the system. Lot numbers may be assigned to soil layers, individual artifacts, clusters of artifacts, *features* or samples. Although general rules apply, the rationale for assigning a lot number can vary from excavation to excavation and from archaeologist to archaeologist, depending on the conditions at the site in question.

The 1991 excavation area was divided into four sectors. Each of the four field assistants was assigned to a sector. These sectors were: Feature R at the south end of the site, the southcentral portion, the northwest area including Feature Q, and the northeast sector. All sectors had been partially excavated in 1990 except for the southcentral portion (Figure 3).

The first two sectors were approximately 2 m north-south by 4 m east-west. The last two sectors were irregular in size and outline. The latter included the 2 m x 3 m block from 54R-U to 56R-U (excavated in 1990) as well as the previously unexcavated area north of this block, and the new units in the 53 and 57 operation lines (Figure 3).

Two site datum points were surveyed into the excavation area (Figure 3). They were established from the known elevation of a fire hydrant near the water screening area. Datum A, in unit 56M, has an elevation of 229.56 m asl (above sea level) and Datum B, at the northeast corner of unit 63H, has an elevation of 229.35 m asl. The datums were used for recording three dimensional provenience of artifacts recovered *in situ*. Vertical depth measurements were taken from the closest datum to the artifact. Horizontal measurements for the artifact were taken south and west from the northeast corner of the unit. The datums were also used to record the depths of soil layers on profile drawings.

All excavated soils were wet-screened using ordinary window screens and a pressurized hose system. This maximized the retrieval of artifacts including tiny glass trade beads and small bone fragments.

All artifacts were collected and bagged following the directives in the *Parks Canada Archaeology Manual*. These artifacts were then removed to the on-site laboratory and processed, again according to CPS inventory format. Photographs were taken using conventional archaeological procedures and recorded according to the Parks Canada system. Copies of the *Manual* should be consulted for further information regarding excavation procedures.

3.4.2 Laboratory Procedures

In 1991, as in 1990, all laboratory facilities were combined in the larger trailer. This enabled participants and lab staff to work consistently side by side, with supervisors always on hand to answer questions and demonstrate lab procedures.

The procedures for processing artifacts in 1991 remained unchanged from those of the previous two seasons. Large unit bags, each labelled with the provenience corresponding to a single excavation unit, were placed in the lab trailer. Artifacts from each lot were brought in from the excavation in labelled field bags and placed in the corresponding unit bags. Depending on the material, the artifacts were then washed or dry-brushed. Although materials like glass or glazed ceramic are generally not harmed by contact with water, rusty metal, fragile wood, faunal remains and chinking are adversely affected and were cleaned using only a dry toothbrush. To ensure that small artifacts were not lost in the cleaning process, all field bags were emptied into fine mesh sieves prior to cleaning. The cleaned artifacts were placed on styrofoam meat trays and, along with the field bags, which had the provenience and excavation date recorded on them, were then placed onto drying racks.

After the artifacts had dried, participants sorted them into classes defined by Canadian Parks Service for archaeological materials (Parks Canada 1982). These artifact classes are a combination of both material and functional types. For example, all bone and shell are contained in the class Fauna, but glass is divided into Window Glass and a second, more general class of Glass containing items from glass bottles to railway signals. All beads, regardless of material, are contained in a separate class. The CPS artifact classes used were: *Glass, Window Glass, Historic Ceramics, Smoking Pipes, Nails, Fasteners, Metal (General), Metal Containers, Arms and Ammunition, Fauna, Beads, Miscellaneous Organic, Miscellaneous Inorganic, Analytical Samples, Lithics,* and *Worked Bone.*

Artifacts of each class were then placed into plastic artifact bags. Participants recorded class, quantity, weight and provenience information on a card and placed the card into this artifact bag. This initial stage of analysis is called primary sorting.

Primary sorting was followed by secondary sorting. At this stage, artifacts received a more detailed examination, necessitating closer supervision by laboratory staff. Artifacts that had previously been lumped together under a single class during primary sorting were separated, examined individually and numerically coded in preparation for data entry. Lab staff helped participants identify artifacts and assign codes that best described the artifacts. For participants who wished to try their hand at detailed artifact identification, a wide range of reference manuals and a microscope were available (Figure 8).

Broken artifacts were reconstructed whenever possible. This usually applied to glass, ceramic sherds, and faunal remains. White glue was used to fit the sherds together; the mended piece was then placed into a tray filled with sand to stabilize it until the glue dried.

All participant work was checked by lab staff prior to computer data entry, the final stage of on-site artifact analysis. Data entry was performed by lab staff. This provided a final checkpoint to identify and correct any errors that may have been made. At this time, a sequential inventory number was assigned to each artifact, prefixed by both the artifact provenience and the CPS site designation. For example, artifact number 7759, a metal trigger guard, received the descriptor 21K66B12. This tells us that the artifact was recovered from lot 12, in unit 66B, on site 21K (The Forks).

Figure 8: Working in the Laboratory

As in 1989 and 1990, the data management system utilized was the Canadian Parks Service computer program DOSSIER, developed for use on archaeological sites. The program uses numbered codes that correspond to artifact attributes for each artifact class. Data was entered using a PC AT with a 40 megabyte hard drive and 2 megabytes of conventional RAM. Inventory number, provenience, and general artifact information were recorded on 3" x 5" inch fanfold cards generated via the ANALYSIS cardmaking program on a 9 pin dot matrix printer. These cards were then placed into the plastic artifact bag. All artifacts were stored in closed 28 cm x 15 cm cardboard boxes for further analysis after the end of the field season.

3.5 Site Orientation of Participants

The Forks Public Archaeology Project is a continual learning experience for the professional archaeologists as well as for the public. In 1991, as in the previous years, the challenge was twofold: to conduct an excavation that would maintain professional standards and to provide participants with a training session in archaeological theory and procedure that was both educational and enjoyable.

Five of the professional staff who had been employed during the 1990 project returned for the 1991 field season. Three of these individuals have been with the project since it began in 1989. These returnees provided continuity to the project and were able to help the new personnel become acquainted with daily operations.

Many of the participants had worked at the site in both 1989 and 1990. Others had little experience in archaeology and it was necessary to familiarize these new participants not only with site specifics but with all other aspects of archaeological work. A short lecture session provided the basics of archaeological theory and procedure and was augmented with on-the-job instruction. A number of returning individuals worked with the new participants, sharing their experiences with them. The archaeologists worked with two (occasionally three) participants, creating a close relationship between archaeologist and participant. All the participants were apt students and demonstrated intense concentration while excavating (Figure 9).

Figure 9: Field Assistants and Participants Excavating

The program followed the same format each day. Participants worked from 9 a.m. to 4 p.m., with coffee breaks and a lunch break. They were met on-site by the Participant Coordinator, who gave them name tags, explained the daily schedule of activities and escorted them to the trailer compound. They were shown where to store personal belongings and offered a cup of coffee prior to the orientation session. The Project Director began the orientation session with a welcome to the site, explaining the purpose and importance of archaeology as well as the goals of the project. Following this, the staff archaeologists, on a rotating basis, explained how to use the various tools in the excavation and the laboratory. They presented a brief history of The Forks and a general history of Manitoba during the Fur Trade Period. Participants were encouraged to ask questions. All participants were then taken to the excavation area, where they were shown how to move about in the pits without disturbing

surfaces, walls of the units, or dividing markers. Stratigraphy and current features were described to the participants along with some of the more recently recovered artifacts. Those scheduled to work in the laboratory returned there and received more specific instructions on cleaning and processing artifacts. All participants paid close attention to the rules of the site and were very careful when in the excavation area.

The keys to the teaching program were (a) taking the time to explain why a procedure was necessary and (b) explaining in detail why the procedure had to be done in a certain manner. Every participant was shown which tools to use in various situations and why certain actions were applicable in some cases and not in others. The participants were also shown how to record the information they recovered. Using prepared summary forms, they noted details about the artifacts they had recovered and the soil layers they had encountered. Staff members were always present to provide assistance.

Although many participants' time at The Forks may be the only archaeological experience they will ever have, alumni will be welcome returnees to future excavations. One of the program's primary goals is to give the participants a positive, fulfilling experience and to further develop their interests in heritage and archaeological concerns.

3.6 Visitor Services

In 1991, as in the previous two seasons, two Site Interpreters were hired to explain the excavation and the processes being undertaken. At times, especially on weekends, hundreds of visitors attended the site and talked with the staff, picked up brochures, and toured the lab and kiosk trailers (Figure 10). As with the participants, most visitors expressed a genuine interest in viewing and asking questions about the work being done. All staff readily provided assistance, giving short lectures, and answering questions on an impromptu basis, in the middle of other activities. Many visitors returned to the site throughout the field season to see what new features and artifacts had been recovered. A visitors' guest book was available for comments.

3.7 Site Closure

Anticipating a future return to this area, the proven site protection methods (used at the conclusion of the 1989 and 1990 projects) were repeated. The shoring and re-bar were removed from the east and west walls and most of the Feature Q area. A blue plastic tarp was placed in the excavated units of Feature R. Straw bales were then placed tightly together on top of the tarp. Five millimetre plastic sheeting was spread over the entire site and held in place with rocks.

The original fill, which had been stockpiled beside the B&B Building, was dumped into the entire site. A front-end loader was used to spread the fill over the excavation hole and level it to original ground surface. These procedures should ensure reliable protection of the site and again allow for safe, expedient fill removal when the site is re-opened.

At the close of the field season, the tent was dismantled and, along with the field equipment, was stored at Quaternary Consultants Ltd. The stairs leading to the excavation area were removed and returned to Canadian Parks Service. The Forks Renewal Corporation granted permission for the use of the B&B Building and the Steam Plant as temporary storage areas. The walkway and ramp railings were unbolted and, along with the screens and wooden

Figure 10: Interpreters Explaining Site to Visitors

pallets, stored in the B&B Building. The ramp and walkways were left in place in preparation for future projects. Some furniture and the plywood shoring were stored in the Steam Plant.

The rented trailers were emptied and cleaned. Equipment and retail products were returned to their sources. The computer, artifacts and laboratory supplies were transported to the Archaeology Lab at the Manitoba Museum of Man and Nature, where analysis of the 1991 recovered artifacts was completed.

4.0 STRATIGRAPHY

The stratigraphic layers throughout the site have been grouped into five basic, distinct time periods represented by six events. These events are:

a) the Railway Period (1888–1988);
b) the construction of the B&B Building (1888–1889);
c) the Pre-Railway/Post-Hudson's Bay Company (HBC) Experimental Farm Period (1848–1888);
d) the HBC Experimental Farm Period (1836–1848);
e) the 1826 Flood;
f) the Fur Trade Period including Fort Gibraltar I (1810–1816).

Numbers were assigned to the stratigraphic layers as a means of standardizing descriptions and establishing a chronological sequence to help describe both the natural and the cultural events. In contrast, letters were assigned to the features to distinguish them from soil layers. Feature descriptions are provided in Section 5.

No new stratigraphic layers were identified during the 1991 field season. Many of these layers occur in association with features and are described in detail in Section 5. There are a total of 38 layers which are described in detail in Figure 11.

The area of The Forks has been affected by numerous floods over the past millennia. Every stratigraphic profile does not have evidence of each and every flood event. The 1984 excavation found evidence of other floods that occurred in 1852, 1861, and 1882. During The Forks Public Archaeology Project excavations (1989–1991), evidence of the 1826 flood was recorded, as well as soil layers that would have been deposited by some of these floods and/or high water marks which do not qualify as floods.

The flood soils are defined as a Cumilic Regosol horizon. The soils are

> *. . .a comparatively unaffected recently deposited river alluvium, granular and friable, varying from loam to silty clay in texture, neutral to mildly alkaline in reaction, dark layers of buried organic residues deposited on former surfaces* (Manitoba Agriculture n.d.:31).

The organic matter usually decreases irregularly with depth. Regosolic soils are generally weakly developed, lack genetic horizons, and consist of primarily pure quartz sand. These characteristics are due to a number of factors, including general climatic conditions and the instability of the material, which is recently deposited alluvium.

4.1 Railway Period

In 1989, the uppermost part of the railway fill was removed to a depth of 1.25 m by a skilled backhoe operator, in preparation for laying out the grid. The remainder of the fill was removed by shovel and trowel and designated as 21K50A99. During the 1990 and 1991 field seasons, the railway fill was again removed by a backhoe. In most of the units, the B&B Building construction sand level was exposed below this fill. The small amount of remaining fill consists of two main stratigraphic layers.

Layer 1: Uncompacted fill of grey, black, and red cinders and gravel covering the entire site.

Layer 2: Orange to black leaching from the cinders. The staining appears along the eastern edge of the excavation, particularly in the northeast corner, where it extends down to the 1826 Flood sands in unit 21K53N.

4.2 B&B Construction

Soil deposits associated with the construction of the B&B Building were observed in the western half of the excavation in 1990 (Kroker *et al.* 1991).These strata were present in all new units started this season, excluding 54N and 64F, and those in the 53 and 63 operation grid lines. The layers are thickest (up to 14 cm) in units 54V-X to 56V-X and become thinner in units 57R-U, averaging approximately 2.5 cm.

Soil layers 3, 4, 5, 6, and 7 consist of construction sand and clay. They were clearly visible in the south-central portion of the excavation area.

Layer 3: Coarse-grained construction sand below the railway fill.

Layer 4: Construction sand with patches and pockets of clay mixed with charcoal, giving a mottled appearance.

Layer 5: Mottled mixture of brown, buff, tan, grey and black sands that vary in texture. Known colloquially as *Australian Camouflage* due to the resemblance to military uniforms.

Layer 6: Coarse sand containing a large number of small pebbles.

Layer 7: Also *Australian Camouflage*, but with a clayey texture.

4.3 Pre-Railway/Post-Experimental Farm Period

The levels of deposition of the Pre-Railway/Post-Experimental Farm Period occur immediately below the railway fill and/or the B&B Building construction levels. They are consistent throughout the excavation area. Two different soil layers were identified in most of the units.

Layer 8: Mottled, silty clay (dark brown to tan). This layer is consistent throughout the excavation area and includes charcoal staining, charcoal flecks, chips of wood and pockets of ash and sand. Because of the high clay content, the stratum turns extremely hard when dry. It varies in thickness from minimal to 14 cm, averaging 4 cm to 5 cm.

Layer 9: Tan to buff silty clay with some swirl patterning.

In some units, the mottled clay of Layer 8 appears as a greasy black level with extensive staining. In addition, larger pieces of wood, some charred, were excavated from this stratum. Layer 8 grades into the lighter, silty clay of Layer 9, and in 1991 the layers become mixed in the southern half of the excavation. Layer 9 eventually disappears in the southern end of the excavation where Feature R is located. This layer contains few artifacts and may have been formed by fluvial action.

Railway Period	1	Railway fill including cinders and gravel. This is the top stratigraphic layer throughout the site. It underlies landscape material (i.e., sod)
	2	Orange-dark brown stain (leaching from cinders) consists of fine particles of cinder and coal dust. Stain extends into upper surface of underlying stratum
B&B Building	3	Construction sand, tan to buff (coarse grain)
	4	Construction sand with some inclusions of Australian Camouflage sand
	5	Australian Camouflage sand; mottled mixture of sand of different colours and textures in patches of brown, yellow, and buff
	6	Buff coloured coarse sand, with small pebbles
	7	Australian Camouflage clay; mottled appearance with patches of brown, yellow, and buff. Clayey in texture
Pre-Railway/ Post-1826 Flood	8	Mottled clay; dark brown to tan
	9	Tan-buff clay, swirly patterned
	10	Brown coloured clay with organic stains, correlated with the HBC Experimental Farm (1836–1848)
1826 Flood	11	1826 flood sands, yellowish in colour
	12	Flood sands with embedded lenses of tan clay
	13	Buff coloured sandy clay

Figure 11: Description of Soil Layers

Fur Trade

14	Fur Trade Clay—mottled dark brown, silty clay. Deposited between 1817 and 1825
15	Buff coloured silty sand
16	Buff coloured silty clay
17	Silty clay with brown organic stains
18	Grey-brown clay with clusters of beads and shot
19	Clusters of chinking, charcoal, and wood
20	Clusters of red chinking
21	Organic brown lens
22	Light grey ash pockets
23	Grey-brown clay
24	Brownish-grey clay
25	Pockets of charcoal, bone, and shell
26	Organic lens with black charcoal
27	Light brown clay with sand patches
28	Greasy, dark grey clay with cracks resulting from either freezing or drought
29	Brown clay with silt inclusions
30	Greyish-brown silty clay, swirly patterned
31	Greasy, dark grey-green clay
32	Mottled grey silty clay
33	Grey clay
34	Grey-green silty clay
35	Orange chinking
36	Carbon stained flooring
37	Wood/timbers
38	Chinking, charcoal, and ash

4.4 Hudson's Bay Company Experimental Farm

Evidence of the HBC Experimental Farm is contained within a single layer.

Layer 10: Reddish-brown organic, mottled, silty clay. A quantity of manure, associated with the Experimental Farm, was found within this layer in 1990 and 1991.

In 1991, Layer 10 was found throughout the excavation, especially in the west-central portion, where it was up to 6 cm thick along the west wall of units 56V-X. A considerable amount of wood, some soft and decayed, was found in units 57R-U. Scattered amounts were present in unit 55N, unit 55P, and along the north wall of unit 56Q. The significance of this wood will be discussed in Section 5.1.

4.5 1826 Flood

Deposition of thick layers of sand requires the presence of large-scale, rapidly-moving flood waters that are suddenly slowed. A major flood, known to immediately pre-date the Experimental Farm, occurred in 1826 depositing three layers.

Layer 11: Yellowish flood sands. The stratigraphic position of this layer, below the plow zone of the Experimental Farm and above the Fur Trade strata, confirms the designation of this sand level as representative of the 1826 Flood. This stratum provides an excellent control for the separation of the stratigraphic deposits at the site. The thickness of this layer ranges from minimal to 30 cm. It is thickest in the western units, tapering to only a few grains in the eastern units.

Layers 12 and 13: The fine lenses of sands and silts have a swirled pattern, and in most of the units include discontinuous tan clay or buff-coloured sandy clay lenses, 1 cm to 2 cm thick, as well as charred and calcined bone, charcoal specks and shell. Patches of brown organic material and decayed wood were also recovered. These lenses of artifacts are the result of secondary deposition and could have been washed in or smeared during the flood.

4.6 Fur Trade Period

Soil layers 14–38 pre-date the 1826 Flood. During the 1991 project, excavation continued in Fur Trade levels in Features Q and R. Many new units were started in 1991 and most were not completed to the base of the Fur Trade Period or to below Fort Gibraltar I levels. Few artifacts were recovered from pre-Fort Gibraltar I levels. Soil layers related to features produced most of the Fur Trade artifacts. Below the features, sterile silty clays were encountered.

Layers 14 to 38: The predominate soil (Layer 14), a mottled, dark brown, silty clay with organic stains and patches of olive grey to tan silt, contains articles of wood and bone fragments. There are several charcoal (Layer 26) and brown organic lenses (Layer 21) at various depths, as well as pockets of sand with ash (Layer 22), clusters of chinking (Layers 20 and 35) and charred wood (Layers 19 and 37).

Immediately below the sand deposits of the 1826 Flood, many impressions and ruts were observed in the Layer 14 silty clay. These were present throughout the excavation outside of Feature R. Further examination revealed the impressions to be animal hoofprints while

the ruts may have been formed by the wheels of a cart or buggy. At least one human print may also be present. This phenomenon is described in Section 5.2.1.

Many Fur Trade artifacts were recovered from the upper levels of this period or deeper features (Q and R). The frequency gradually decreased until a sterile soil layer was encountered. This sterile stratum contains silty clay (Layer 16) with some charcoal deposits and could be related to another flood episode. Below this sterile layer was a brown organic clay containing ash, charcoal and wood associated with Fort Gibraltar I. Many artifacts, such as beads and shot, were recovered from this level. Further excavation in Features Q and R revealed a predominately sterile mottled grey silty clay (Layer 32) or a greasy grey-green clay (Layer 31). These are pre-Fort Gibraltar I strata and contain few artifacts.

5.0 FEATURES

Seven features are discussed in this section. Five features occur in fur trade levels, while the other two are in later horizons. Features Q and R, relating to Fort Gibraltar I, were initially investigated during the 1990 field season. In 1991, the excavation of Feature Q was completed; Feature R was not. An ash deposit, considered as part of Feature R in 1990, has been found to be extensive and was treated as a separate feature in 1991. The other four features were encountered during the 1991 field season.

5.1 Pre-Railway/Post-Experimental Farm Period

Feature T: Post Hole

A post hole, approximately 30 cm square, was found in the eastern portion of unit 21K57S (Figure 12). It started within the tan silty clay of Layer 9 and the vertical sides extended ca 30 cm in depth, ending 3 cm into Layer 14 (Fur Trade Period). A few wood fragments and faunal remains were recovered. This post hole (Figure 13) is similar in size and extends through the same soil layers as the Feature C and Feature S post holes excavated during the 1990 field season (Kroker *et al.* 1991:41–42). Feature T is approximately 1 m northwest of Feature S (Figure 12).

Feature U: Post Hole

Another post hole was located in the southeast corner of 21K56N (Figure 12). It also began in Layer 9 and continued 35 cm in depth, through the Layer 14 Fur Trade clay, into the chinking and charcoal layer of Fort Gibraltar I. Unlike the other post holes from this time period, it is not square, measuring 30 cm north-south and 45 cm east-west. The eastern portion flares out in the upper 10 cm, while the western half has straight sides. This out-flaring is perhaps the result of the post having rotted and fallen over. Alternatively, it may have been pushed or kicked over. The post hole contained charcoal, decayed wood, chinking, faunal remains and glass fragments. A few square nails were recovered in the upper part, while five glass trade beads, a scalloped lantern glass fragment and a piece of red glass came from near its base. The feature is approximately 2 m northeast of Feature T and 5 m equi-distant between Features C and S (Figure 12). These post holes are aligned within 1 m north-south and could relate to a structure or a fence.

A scattering of wood fragments, possibly associated with these post holes, dates to the Experimental Farm Period (Layer 10). Much of this wood is soft and decayed. It predominates in units 57R-U and 56P, with lesser amounts in units 56N, 55N, 55P, and 55Q. In unit 57U there appears to be more than one wood layer. Some bark fragments were also recovered from this unit. The wood comprises most of the 3–4 cm depth of Layer 10 in the western units (57S, 57T, and 57U). The wood could be debris left from the manufacture of the posts or the structure represented by Features C, S, T, and U. It may also be part of a wood pile.

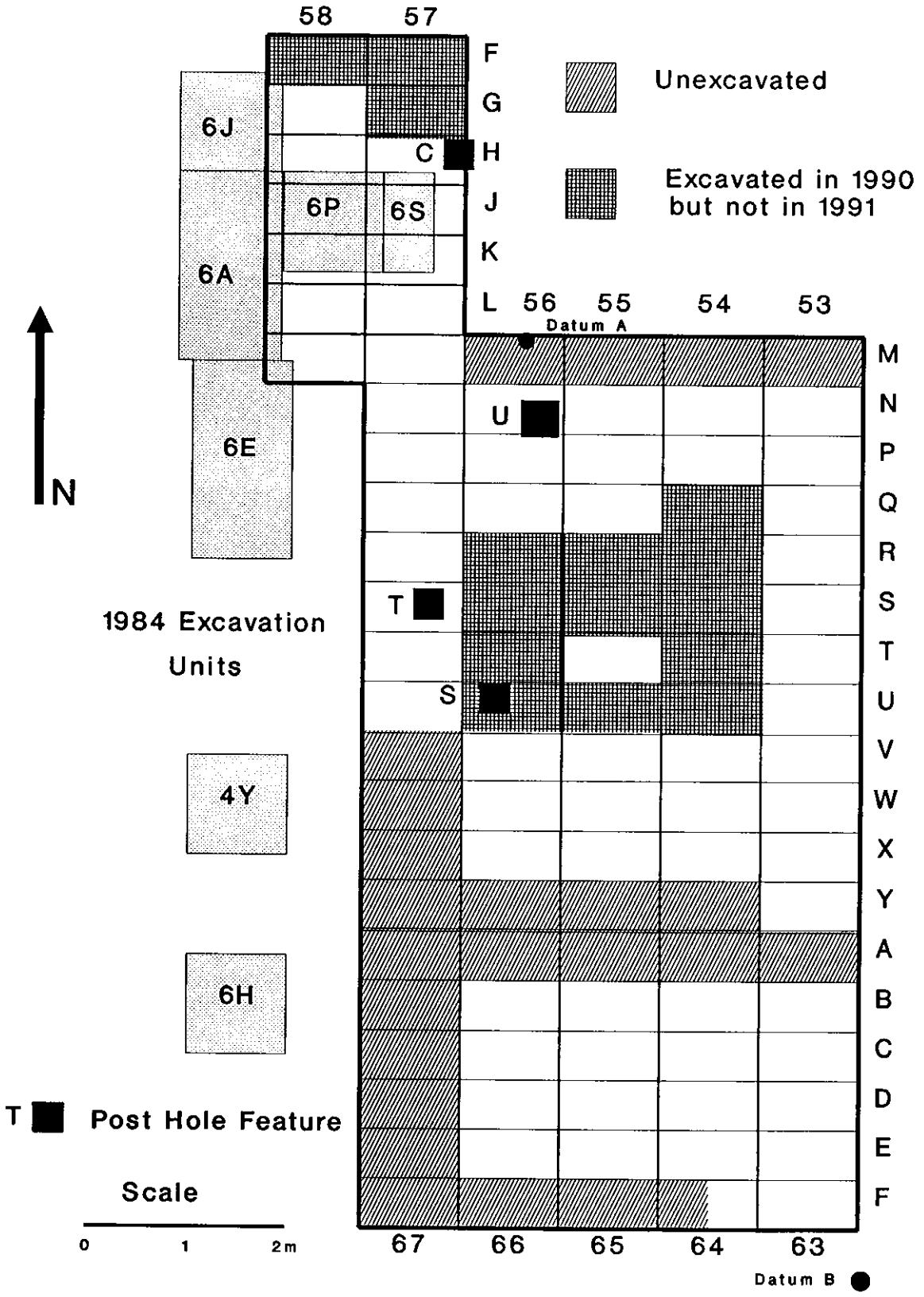


Figure 12: Post Hole Features

Figure 13: Post Hole

5.2 Fur Trade Period

5.2.1 Post-Fort Gibraltar I Period (1816–1826)

Feature V: Hoofprints and Wheel Ruts

Immediately below the 1826 flood sands, a number of prints and impressions were revealed in the Layer 14 Fur Trade clay. The prints, 3–4 cm deep, were generally oriented in a north-south direction, paralleling linear ruts, which in turn parallel the Red River. This feature covered an area approximately 5 m x 5 m, from units 53N-W west to 57Q-U, including 54N-P, 54V-X, 55T-W, and 56N-X (Figure 14). Analysis during the field season identified many of the prints as tracks of large, cloven-hoofed animals (cattle, oxen), while others could have been produced by horses. One impression resembled a human footprint. The ruts looked similar to cart or buggy tracks.

In order to preserve the clearer tracks for further analysis, 20 representative samples were cast using Plaster of Paris. Two slab casts were also made, covering all of unit 54X and the southern 20 cm of unit 54V. Detailed drawings were made and photographs taken. Prints in the 53 operation line were predominately floodworn and smeared, and most were superimposed on each other. This made it difficult to distinguish individual tracks. Subsequently, only three tracks were cast in this area. The best preserved tracks were found in the 56 and 57 operation lines and 14 of the 20 casts were made here.

Post-field season research has confirmed that the majority of the prints were likely produced by domestic cattle. These prints are similar in size and shape to those discussed by Murie (1954:314–315). He illustrates an adult Hereford cow track in mud, measuring 4 ¼

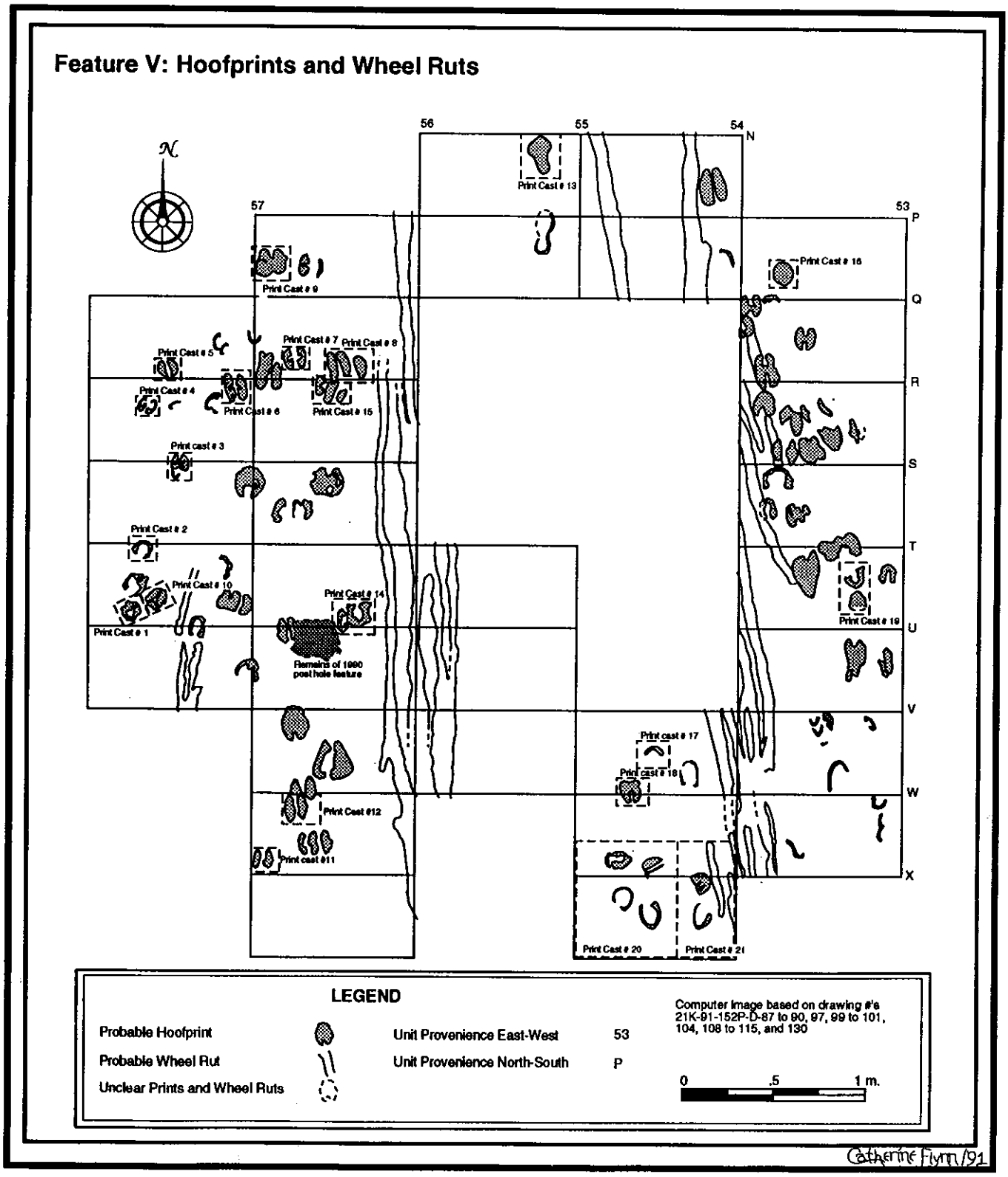


Figure 14: Hoofprints and Wheel Ruts

to 4 ¾ inches (11 to 12 cm) long and a large calf track 3 inches (7.5 cm) in length (Murie 1954:315). Bison tracks resemble those of cattle but are longer and blockier, averaging 5 inches square (13.7 cm square) (Murie 1954:309; Stackpole Books 1968:47). Young cattle tracks can be similar to those of adult elk. However, elk tracks are generally 10 cm long while those of a large calf or yearling are 7.5 cm (Murie 1954:271–273; Stackpole Books 1968:33).

The tracks resembling those of cattle ranged in length from 7 cm to 22 cm, averaging 13.5 cm. This range and average are slightly greater than those of adult Hereford cattle (Murie 1954). A possible explanation is that the tracks at the Fort Gibraltar I site were made by cattle or oxen larger than Herefords. Many prints also are indistinct and appear to have been smeared, thus enlarging their size.

Other prints resemble those of shod and unshod horses. Shod horses produce a track with the rim strongly outlined, while unshod tracks show a single round or oval hoof with a V-indent in the middle and are about 15 cm long (Murie 1954:314, 316). The latter are represented by at least three examples, in units 53P and 54X. Three or more shod tracks are possibly present in unit 57T, while two others are in units 56T and 53T.

The human print, found in unit 55N, is 23 cm long and has a maximum width of 15 cm (Figure 15). There are no deep heel impressions, indicating a shoe or boot was not worn. A moccasin-clad foot could have made the print. A portion of another similar print was found 23 cm to the south and was likely produced by the same individual.

Associated with the tracks are long, linear, parallel ruts (ca 2 cm deep) resembling wheel marks from a cart or a buggy (Figure 16). The ruts occur along the western edge of units 53Q-W, where there are two or three present. They vary in width from 4–8 cm and there is a gap of 2–22 cm between ruts. Two parallel ruts run through units 54N–P, extending north into unexcavated unit 54M and south into unit 54Q. This set of ruts ranges in width from 7–15 cm and there is an average spacing of 42 cm between ruts.

A second long set of ruts was found along the western edge of units 55T–V and the eastern edge of units 56P–X. There are three parallel ruts, two of which combine to form a single rut, 13 cm wide, in units 56R and 56T. Individual ruts are 4–7 cm wide. Portions of another rut are present in units 57T and 57U.

The ruts generally run along the prints, obliterating part of a print in unit 53S. Three prints appear to overlay part of a rut in unit 53Q. This indicates that the prints and ruts were probably formed at the same time or over a number of days when the clay was wet. Measurements of the width between parallel sets of ruts vary slightly but seem to average 177 cm (70 inches). The spacing appears to be uniform and it is currently thought that the ruts represent a buggy or a light-weight wheeled vehicle rather than the poles of a travois.

The presence of horse and domestic animals in the Red River Settlement prior to the 1826 flood has been well documented (Ross 1856; Morton 1967; Murray 1967; Kaye 1981; Coutts 1988). From 1812 to 1817, cattle were shipped in small numbers from HBC and NWC posts in Rupert's Land to the Red River (Kaye 1981:164). Some cattle, sheep, and pigs were shipped from Britain to Hudson Bay and then to the Red River from 1812 to 1820. An insufficient number of animals arrived to maintain a breeding stock. The first specific reference to domestic animals at The Forks area occurs in 1813 when Peter Fidler purchased a bull, a cow, and a yearling heifer from the NWC at Brandon House and brought them to Point Douglas (Ross 1856:73; Morton 1967:48).

Figure 15: Human Print

Figure 16: Wheel Ruts

After 1820, herds of cattle were driven from the St. Louis area to the Red River colony. Initial drives, in 1819 and 1821, failed due to the severe winters (Kaye 1981:166). The first successful drive arrived at the colony in September 1822 (Morton 1967:66; Kaye 1981:167; Coutts 1988:119). The herd numbered 170, including 96 milch cows, 1 bull, and 23 oxen sold on contract (Kaye 1981:167). The remainder were purchased by wealthy, retired HBC officers. Ross (1856:73) notes that the prices were high: "Good milch cows sold as high as 30£ sterling each; and oxen trained to work fetched 18£ a head."

Three additional cattle drives were made to the Red River colony. In 1823, 210 cattle arrived, in 1824 a small herd of 90, and the final drive in 1825 brought 165 head (Kaye 1981:167; Coutts 1988:119). By 1825, prices were considerably lower as demand decreased. Milch cows sold for 6£ each and the largest trained oxen from 14£ to 20£ a pair (Ross 1856:82). These drives produced sufficient numbers to keep up a stock and, in the 1831 Red River Settlement census, there were 1194 cattle, 801 calves and 958 oxen (Murray 1967:40).

Other domestic animals present in the Red River colony were sheep and pigs. A small number of sheep arrived with the colonists in 1812, but did not survive and, by 1817, there were none left in the colony (Morton 1967:48; Kaye 1981:169). In 1831, a few sheep were shipped from Britain. The only successful sheep drive was in 1833 when 1475 head were purchased in Kentucky. The return journey of 1500 miles (2700 km) was difficult and only 251 sheep survived (Ross 1856:148). This proved to be an adequate amount and, in the 1840 census, there were 1888 sheep in the Red River Settlement (Murray 1967:40).

Pigs initially were few in number in the Red River colony and in 1822 only 12 were present. By 1831 they numbered 362, but by 1834 over 2000 were recorded in the Red River census (Murray 1967:40).

This information shows that by 1826 there were considerable numbers of domestic cattle, but few other domesticates (sheep, pig) present in the Red River Settlement. Undoubtedly, some of these cattle would have been present at The Forks. The animal tracks and wheel ruts could indicate that, sometime between 1816 and 1826, a cart trail between Fort Gibraltar II (Fort Garry I) and the Red River Settlement was present. They could also indicate the presence of a stockyard in the vicinity. The tracks could have been sun-baked in the mud and then inundated by the 1826 flood waters.

Alternatively, the tracks and ruts were made by settlers and traders leaving the area with their cattle as the flood waters rose in May 1826. Ross (1856:103) notes that once families were safe ". . . . the first consideration was to secure the cattle, by driving them many miles off to the pine hills and rocky heights." The impressions would have been made in the soil which had thawed during daylight hours and froze overnight. The flood waters rose rapidly and when the current slowed, deposited the layers of sand over the frozen impressions. The different textures (sand over clay) ensured the preservation of the prints and ruts when the soil dried after the flood.

The discovery and recognition of these prints is unique in Canadian archaeology. An unusual sequence of events has resulted in the preservation of these impressions, thereby giving us a glimpse of a very ephemeral occurrence.

5.2.2 Fort Gibraltar I Period

Several features relating to structural components of the Fort have been located during the three seasons of excavation. The recoveries of the 1991 season (Figure 17) are a continuation of elements discovered during 1990 (Kroker *et al.* 1991).

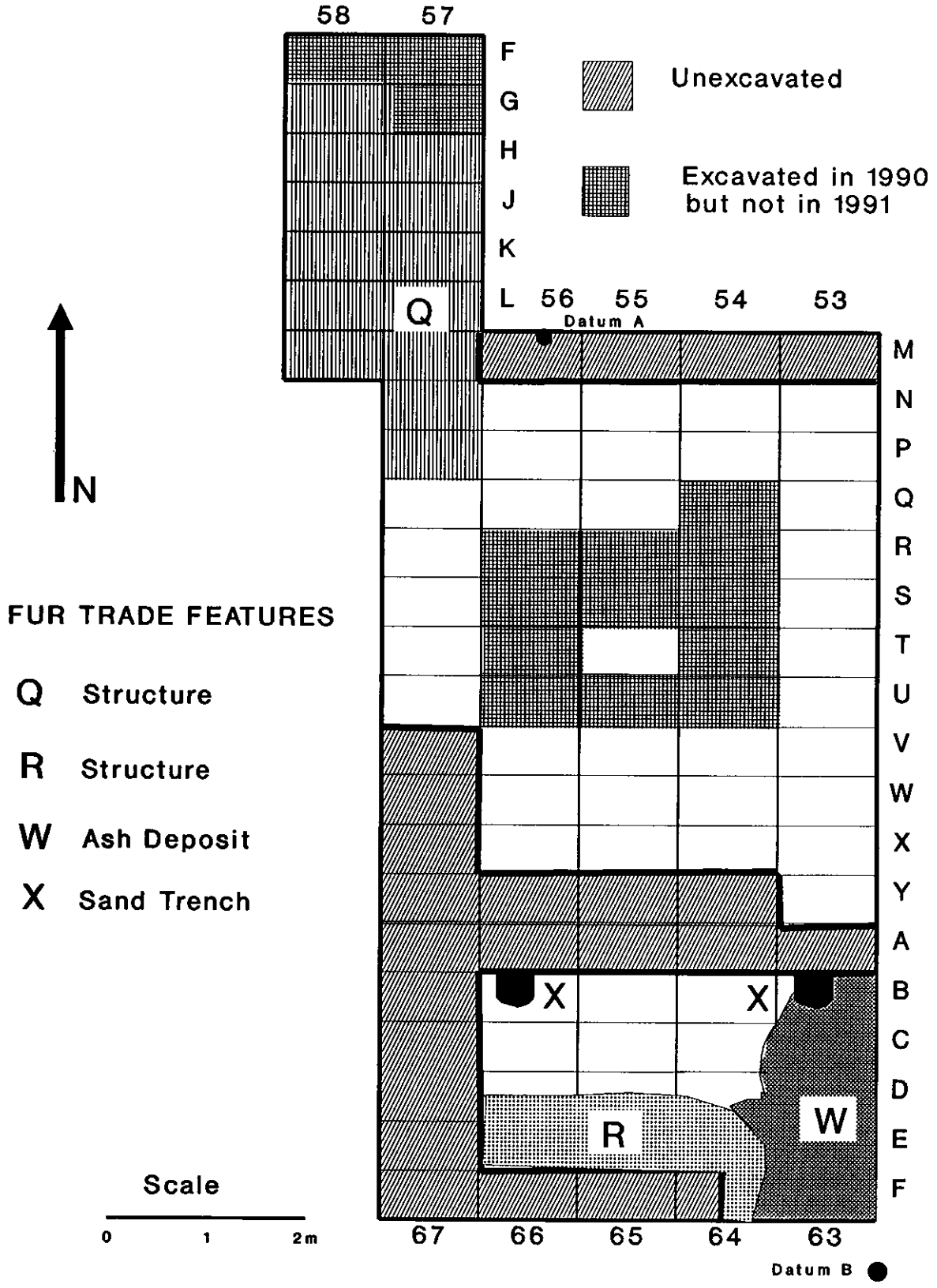


Figure 17: Location of 1991 Fur Trade Features

Feature Q: Chinking, Wood, and Carbon Stained Flooring

Excavation of Feature Q started in 1990 (Kroker *et al.* 1991:52–56) and continued in 1991. The area of Feature Q, as uncovered during the two years, encompasses units 57H–M and 58G–M (Figure 18). This area incorporates all of the 1984 CPS units, 21K6P and 21K6S, the eastern edge of units 21K6A and 21K6J, as well as the northeast corner of unit 21K6E (Figure 3). The 1984 excavation of these units ceased when a wood flooring or carbon stained flooring level was encountered (Priess *et al.* 1986). During the 1990 field season, excavation in units 57H to 57K stopped at the edges of unit 21K6S (Kroker *et al.* 1991). In 1991, this unit and 21K6P adjacent to it were fully exposed.

A linear north-south band of chinking, approximately 20 cm wide, ran through the eastern part of units 57H, 57J, and 57K. The chinking became mixed with ash and extended over the eastern half of units 57L, 57M, and 57N. A carbon-stained flooring level, first identified during the 1984 excavation in unit 21K6S (Priess *et al.* 1986:174), is present in the western part of 1991 units 57H to 57M.

Charred timbers are located beside the carbon-stained flooring, in the western 65 cm to 70 cm of units 58H to 58M. These parallel timbers, oriented north-south, probably represent flooring (Figure 19). Samples of the timbers in units 58J, 58K, and 58L were removed for species determination. They have been identified as poplar, oak, and basswood. The soil between the timbers and the carbon-stained flooring consists of an olive-tan greasy clay and a brown clayey silt, possibly representing the original ground surface on which the fort was built.

The long round pole, revealed in 1990 in units 57G to 57K (Kroker *et al.* 1991:52), was uncovered in 1991 when units 57J to 57K were reopened. A sample of this pole has been identified as poplar. Another pole, located in unit 56K in 1990, was also identified as poplar (Kroker *et al.* 1991:140). These could represent roof supports or stringers which are generally narrow lengths of wood used to reinforce or support a wall or other structures such as a chimney (Smith and Neary 1991).

The sole east-west oriented wood was a fragment 1.4 m long and 10 cm wide commencing in the northeastern corner of 57M, west of the linear chinking band, and extending through 58M. This fragment may relate to the outer south wall, which was defined on the basis of a linear concentration (20–25 cm wide) of chinking and charred wood (Priess *et al.* 1986:132). No charred flooring was found south of this hypothesized south wall.

Excavation in 1991 continued below the timbers in units 57J and 57K and from 58G to 58M. The soil is a grey-brown silty clay or a grey clay with sand. In most of the units, the recovered artifacts included trade beads, lead shot, and small bone fragments. The most productive unit was 58K which yielded 22 beads, 7 lead shot, 4 copper fragments, a square nail, and a small glazed earthenware sherd.

During 1990, an uncribbed cellar depression was excavated in units 57G, 57H and 58G. The area south of the cellar depression was examined in 1991. No additional wood was found and the depression did not extend south into unit 58H. The grey ashy clay produced a trade ring and two beads. The depression was smaller (90 x 50 x 35 cm deep) than a normal Fur Trade cellar and may represent a small, short-term storage pit.

The 1991 excavation south of Feature Q, in units 57P to 57U, revealed a thin (1–15 mm) black charcoal lens, followed by a sterile tan clay (Layer 16). Below this level was a reddish-brown organic soil containing decayed and charred wood fragments as well as a charcoal scatter. This scatter extended into units 55V, 55W, 56V, and 56W, where it became

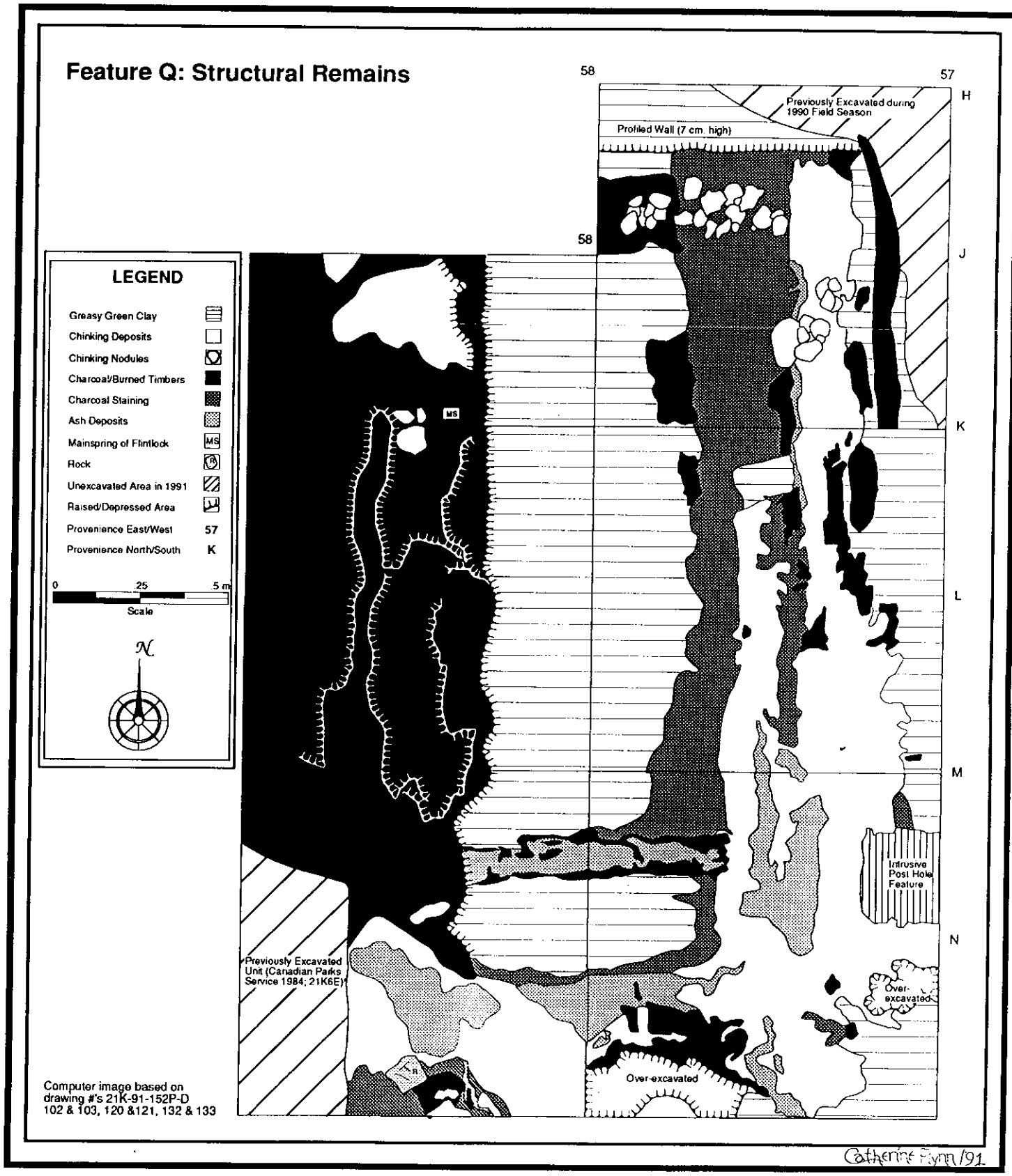


Figure 18: Feature Q

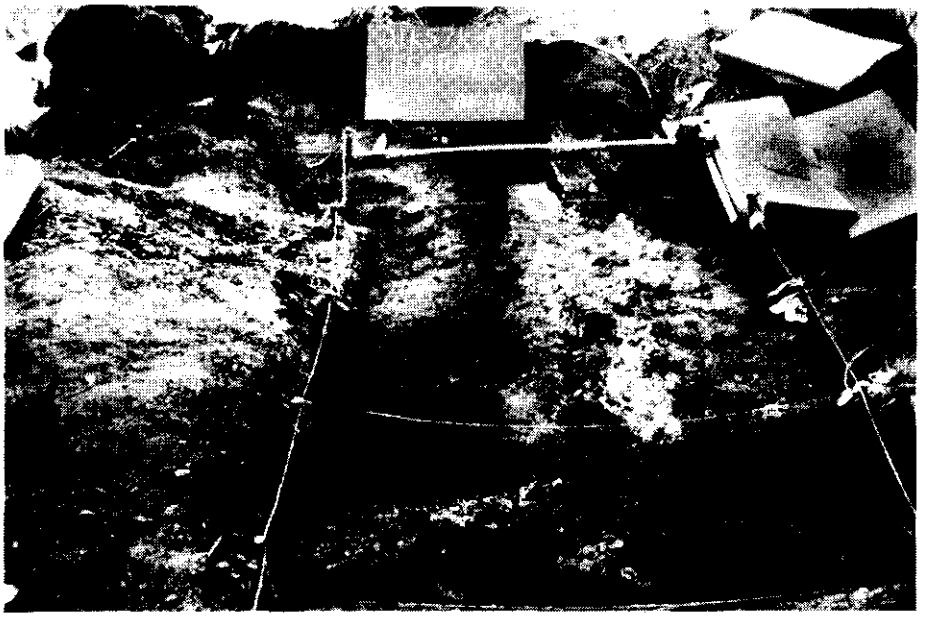


Figure 19: Feature Q

mixed with ash. This sequence of soil layers probably resulted from the collapse of the Feature Q structure, followed by fluvial action, which redistributed the burnt remains and, in the process, formed a thin charcoal lens. The organic/wood layer contained numerous artifacts including trade beads, lead shot, faunal remains, and a gunflint.

Structural evidence was also found east of Feature Q in units 54N, 54P, 55N, 55P, 55Q, and 56N (Figure 17). Ash, chinking, charcoal, and decayed wood characterize this scatter. Many beads, some lead shot, and faunal remains were recovered.

The excavation of Feature Q and linkage with the 1984 excavation provided further evidence of the structure. The south wall could be represented by the east-west wood located in the western part of unit 57M extending through unit 58M. The east wall of the structure was not found in 1991—only a scatter of charcoal and wood fragments. The wall may have been dismantled in 1816 or subjected to erosion.

Feature R: Chinking, Charcoal, and Wood

Feature R excavation continued in 1991. The ash deposit, included as part of the feature in 1990, was given a separate feature designation (W) in 1991 due to its discreteness and size.

1990 excavation of Feature R resulted in the exposure of a charcoal, charcoal staining and chinking layer. A large quantity of chinking was recovered from the southern part of the feature. Below this layer, an ash lens, 1–4 cm thick, was present in most units (Kroker *et al.* 1991:56).

In 1991, a grey silty clay layer with chinking and charcoal was revealed below the ash, in the northern half of the feature in units 64B, 64C, 65B, 65C, 66B, and 66C. In most of these units the average thickness of this layer was 2–4.5 cm. In unit 66C, however, it was 11 cm thick and slumped to the southwest corner, probably extending into the unexcavated units 66F and 67E. Below the grey silty clay, in units 64C, 65C, and 66C, a second ash lens (2 cm thick) was encountered.

Many of the Feature R artifacts were recovered from the ash lenses. These artifacts included trade beads, lead shot, and faunal remains. These types of artifacts, though fewer in number, were also found in the silty clay layers.

Large, charred timber fragments were exposed in units 64D, 65D, 65E, and 66E (Figure 20). These fragments were generally oriented east-west, and in unit 66E extended west and south into unexcavated units. The largest timber (75 cm long and 12 cm wide) runs from unit 64D to 65D (Figure 21). Samples of wood from unit 66E have been identified as poplar and elm.

Thin, vertical fragments of burnt wood, running east-west, were uncovered north of the large timbers in units 65D and 66D (Figure 22). Two individual pieces are approximately 25 cm long. North of this wood, the soil is a greasy, greenish clay, characteristic of pre-Fort Gibraltar I levels. Additional thin, vertical wood fragments were revealed in the eastern portion of units 64D and 64E. These fragments ran north-south and extended slightly into unit 64F, where they became truncated by a tree root or rodent disturbance. East of this wood is the Feature W ash deposit.

Similar vertical wood fragments (Feature M) were exposed during the 1990 excavation and were interpreted as part of the north wall of a structure (Kroker *et al.* 1991:49–50). Feature R probably represents part of another structure, with the vertical wood indicative of the north and east walls. Further excavation to the south and west is required to expose more of this structure.

Feature W: Ash Pit

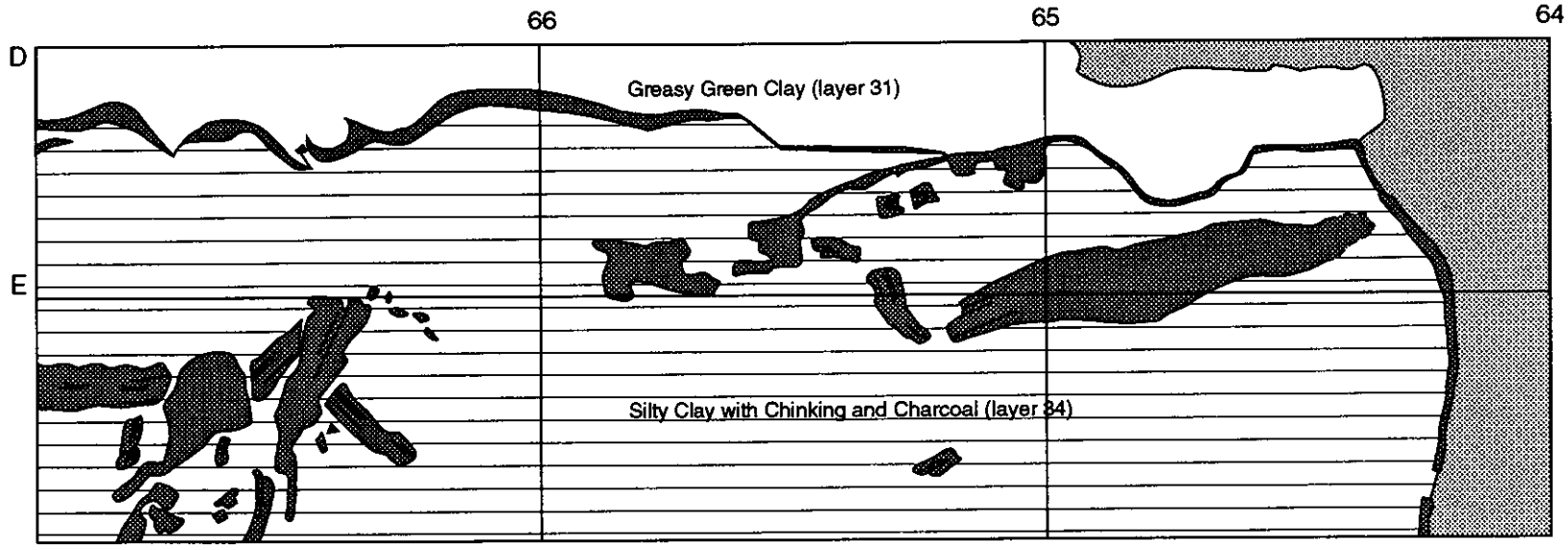
An extensive ash deposit was excavated in units 63B to 63F (Figure 17). It was encountered in 1990 in the eastern part of units 64C to 64E. It was deepest (25 cm) in the southeast corner of unit 64E (Kroker *et al.* 1991:56). Investigation in 1991 revealed that the ash filled a depression which extended from the southern half of unit 63D south, through to the end of unit 63F (Figure 23). The depression covered the eastern 40 cm of these units. The deposit was ca 60 cm thick along its eastern edge and appears to continue toward the southeast, beyond the current excavation boundary. The feature thins to the north, ranging in depth from 3-18 cm in units 63B and 63C.

A clay lens (2 cm thick) was visible below the upper 10 cm of ash. This lens could have separated two periods of ash deposition. The first amount would have filled the depression. Next, a clay cap was added to prevent the ash from spreading beyond the depression. Subsequently, 10 cm of ash was deposited over the clay.

A quantity of artifacts was recovered from Feature W including burnt and calcined bone fragments, chinking, charcoal, a gunflint, a clay button filler, fragments of a Micmac pipe bowl, and 196 glass trade beads.

In units 63B and 63C, the lower part of the feature was interrupted by extensive tree and rodent disturbance. A rodent disturbance was also present in unit 63E, near the base of the feature.

Feature R: Structural Remains



LEGEND

Silty Clay with Chinking and Charcoal		Ash Deposit	
Greasy Green Clay		Provenience East/West	63
Charcoal/Burned Timbers		Provenience North/South	D

Computer image based on drawing #'s
21K-91-140P-D-80 & 81,127

N

0 .5 1 m.

Catherine Flynn /91

Figure 20: Feature R

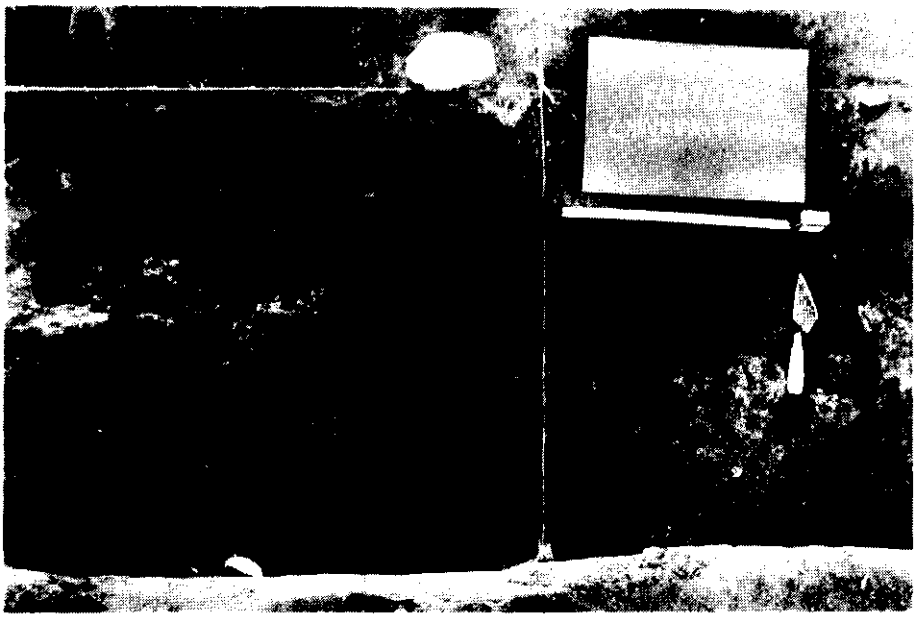


Figure 21: Feature R (plan view)

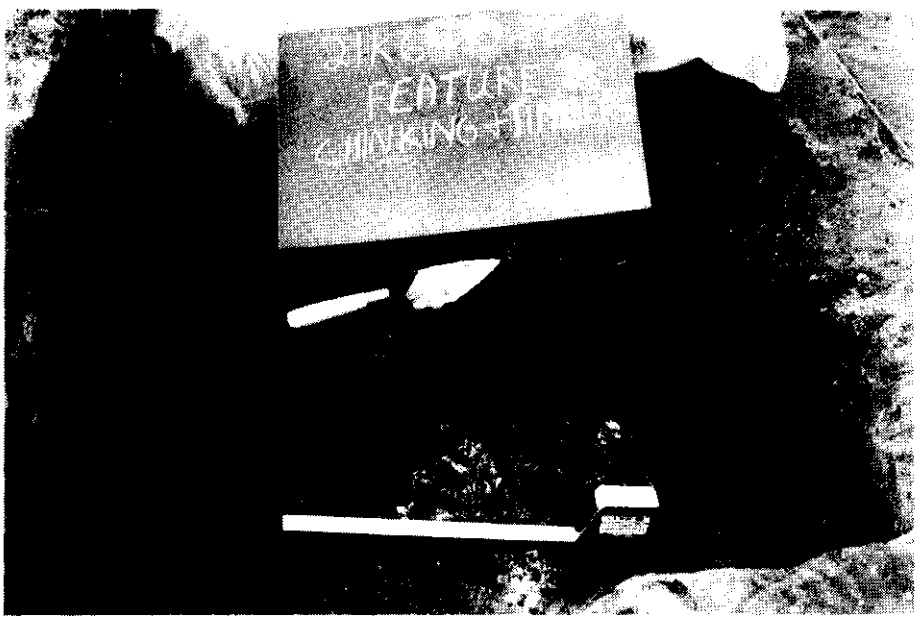


Figure 22: Feature R (vertical timbers)

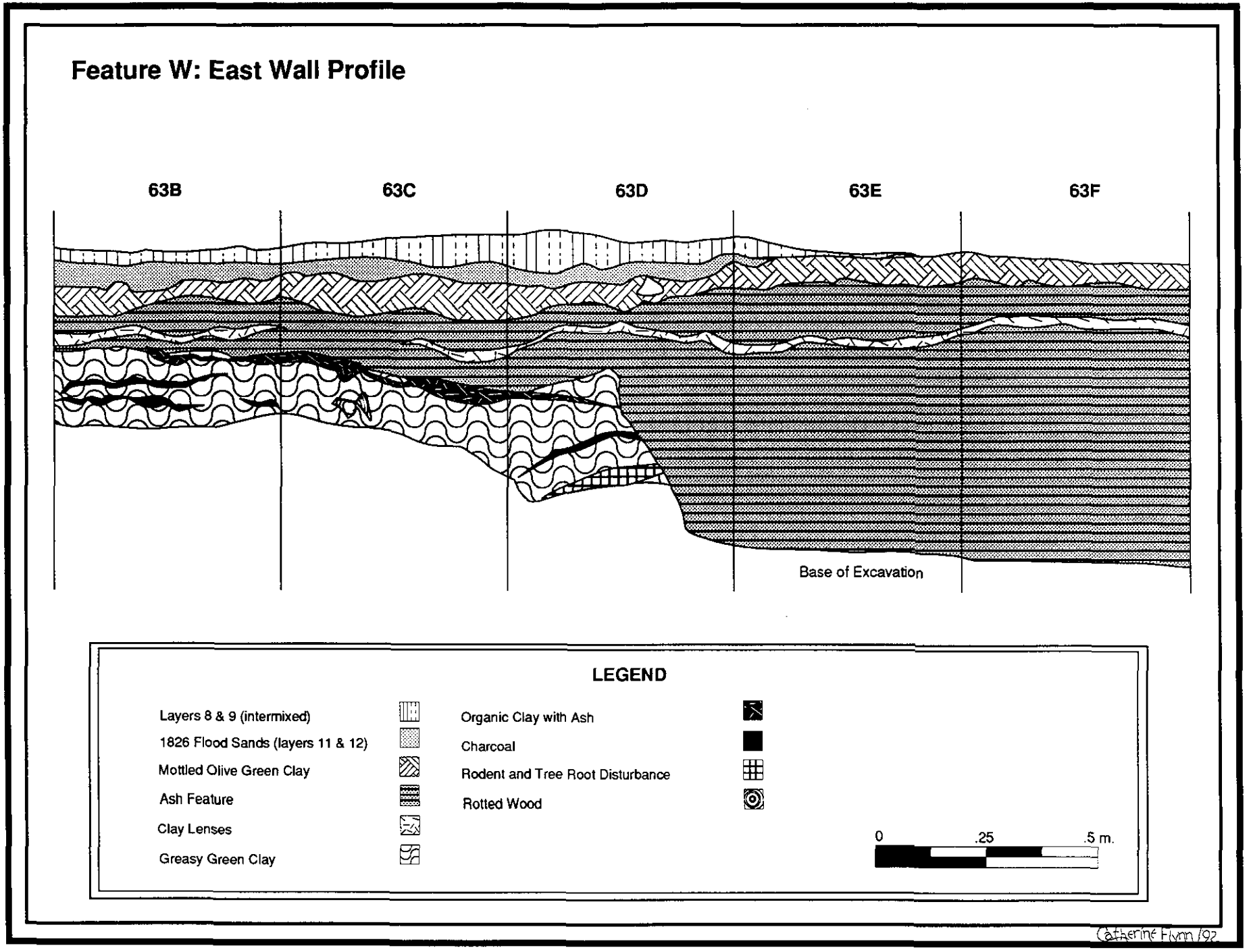


Figure 23: Profile of Ash Pit

A greasy, greenish clay with charcoal and organic lenses was below Feature W and formed the edges of the depression. Small artifacts such as trade beads and calcined bone fragments recovered from the clay probably originated within the ash. In unit 63F, numerous large, complete bison bones were found in the clay layer where it formed the upper boundary of the depression.

Feature W was probably a midden or refuse pit into which ash was dumped. The ash could have been periodically cleaned from a fireplace located in the structure represented by Feature R. The pit may have been a natural depression or dug by the Fort Gibraltar I inhabitants to obtain clay for the manufacture of chinking.

Feature X: Sand Trenches

Two sand-filled trenches were investigated during the 1991 field season. The parallel trenches, located in units 63B and 66B, were approximately 2.7 m apart (Figure 24). They averaged 32 cm long and 22–34 cm wide and extended into the north wall of the units. The unit 66B trench was 90 cm north of the Feature R thin, vertical wood fragments located in unit 66D. The other trench was 110 cm northeast of the thin, vertical wood fragments in unit 64D.

The trenches were first encountered in the 1826 flood sands and continued into the pre-Fort Gibraltar I greasy, greenish clay (Layer 31). The trench in unit 66B is 23 cm deep, while the other is 32 cm deep and has been affected by a tree root or rodent disturbance (14 cm wide) located in the centre.

Artifact recoveries from Feature X include small faunal remains as well as fragments of chinking and charcoal. The trenches may have functioned as drainage channels during the occupation of Fort Gibraltar I, keeping water away from the Feature R structure. The trenches were subsequently filled by sand from the 1826 flood.

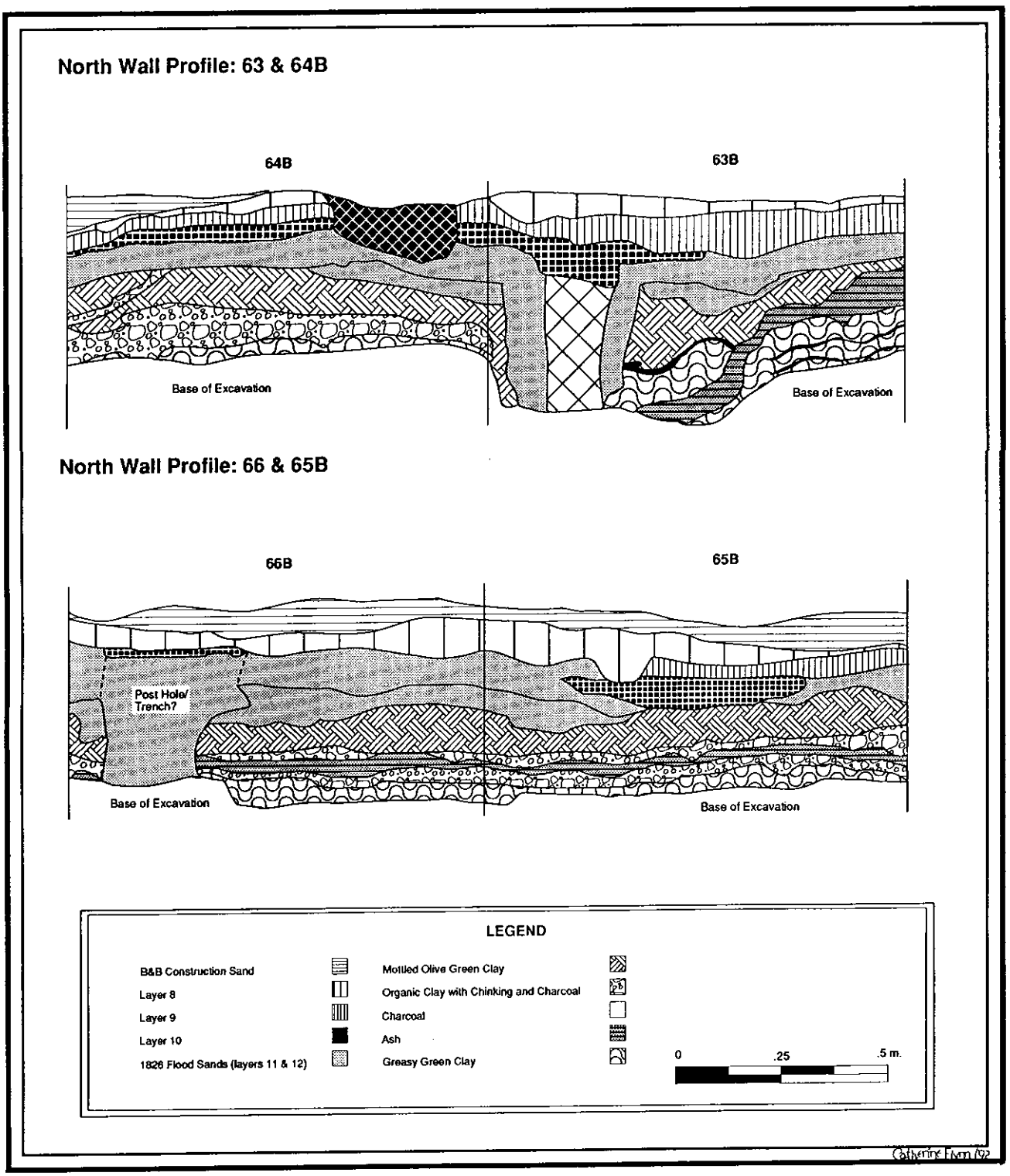


Figure 24: Profile of North Wall with Sand Trench

6.0 CULTURE MATERIAL DESCRIPTION

All artifacts recovered during the 1991 Forks Public Archaeology season are discussed in relation to six major events:

a) the Railway Period (1888–1988);
b) the construction of the B&B Building (1888–1889);
c) the Pre-Railway/Post-Hudson's Bay Company (HBC) Experimental Farm Period (1848–1888);
d) the HBC Experimental Farm Period (1836–1848);
e) the 1826 Flood;
f) the Fur Trade Period, including Fort Gibraltar I (1810–1816).

Due to the large amount of chinking encountered, not all was kept or curated. The procedure employed was: (1) all chinking was excavated and weighed, (2) a smaller representative sample was removed, and (3) the remainder was discarded. When the representative sample was given an inventory number and entered into the database, the weight of the original sample was recorded. In this way, the total weight of the chinking excavated was preserved, even though only a sample was curated.

Similarly, not all shellfish remains were collected. Most of these shells (i.e., fingernail clams and snails) accumulated by natural processes, and many occurred in association with 1826 Flood deposits. The majority were very small and were found in large quantities, making recovery extremely time-consuming. Therefore, where large numbers of the same variety of shell were encountered, only a sample was collected for curation.

All artifacts were placed into labelled field bags and transported to the laboratory compound for analysis. Participants washed, sorted and identified artifacts before assigning numeric data entry codes. Extremely fragile or perishable remains were not washed, but brushed carefully with a dry toothbrush. Very delicate artifacts were set aside for conservation treatment. All other artifacts were washed in fine mesh screens and placed on ¼" mesh drying racks.

After artifacts were dry, they were sorted into predefined CPS artifact classes. These classes were: *Arms and Ammunition, Beads, Fasteners, Glass, Window Glass, Historic Ceramics, Lithics, Metal (General), Metal Containers, Nails, Smoking Pipes, Miscellaneous Organic, Miscellaneous Inorganic, Fauna* and *Worked Bone*. A final class, *Analytical Sample*, was used to record all soil and wood samples collected. No Native ceramics were found during the 1991 Forks Public Archaeology Project (FPAP) season; all other CPS classes were represented.

After the artifacts had been sorted, they were identified using equipment and reference materials available in the laboratory. Staff were available at all times to assist in identifications, which were verified prior to data entry.

Although the above CPS classes were strictly adhered to during artifact identification and data entry, they were modified slightly for the purposes of this report. For example, buttons are coded within the CPS system according to material and can be classified as Worked Bone, Fauna, Miscellaneous Inorganic, Glass or Historic Ceramic. All buttons recovered during the 1991 excavations were examined as a single group regardless of material type (Section 6.3).

6.1 Arms and Ammunition

This section includes all arms-related artifacts recovered from the 1991 excavations. The majority of these artifacts, including gun parts, gunflints, and lead shot, were recovered from Fur Trade levels. Lesser amounts of lead shot, as well as cartridge cases, were located in more recent horizons.

6.1.1 Gun Parts

Two gun parts were recovered from Fur Trade levels. 21K58J2-10997 is the mainspring from a flintlock (Figure 25a). 21K66B11-7759 is the front finial of a flintlock triggerguard (Figure 25b).

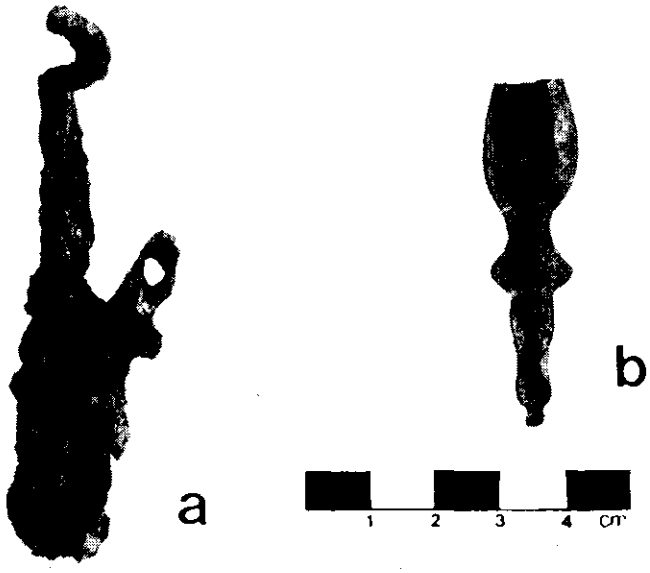


Figure 25: Gun Parts

By 1625, firearms became a significant item in the fur trade, with flintlocks available in sufficient numbers and at sufficiently low prices for their use to be practical (Hamilton 1968:1). The flintlock type of firearm

> *. . . consisted of a wrought iron barrel which was charged through the muzzle with powder and ball...and ignited by a spring-activated mechanism which struck a flint against a steel . . . . The barrel and lock, with the buttplate, triggerguard, sideplate, and other incidental furniture, was mounted on a wooden stock which normally extended the full length of the barrel* (Hamilton 1976:3).

Flintlocks remained virtually unchanged mechanically for nearly two hundred years, becoming obsolete by the middle of the nineteenth century (Wilkinson 1971:21).

The mainspring is a part of the lock mechanism that activates the cock, allowing the gun to fire. 21K58J2-10997 was found resting on the burnt timbers of Feature Q, a structural portion of Fort Gibraltar I. Fragments of burnt wood adhere to the heavily corroded spring. It measures 81.9 mm in length, with a maximum width of 19.3 mm.

Little research has been conducted on variations in lock mechanism parts. Gun type, dates, and manufacturer cannot be determined from an isolated gun part of this nature. Wade (1975:47) states that the mainspring form is generally similar on a range of different firearms. A survey of references, however, reveals that mechanism parts do vary, but how and why is not clear.

The recovery of an isolated gun part is not uncommon. Older damaged guns and locks were stripped of useable parts (Hamilton 1976:20). Mainsprings and other gun hardware were commonly shipped from Europe as parts (Gooding 1962:32–33).

21K66B11-7759, the front finial, is manufactured of cast iron. File marks are visible on the flat underside. Measuring 52.5 mm in length, its shape is the stylized torch that Hamilton (1968:13) considers characteristic of a Type D trade gun. An "R" surmounted by a crown is stamped on it.

Hamilton (1980:31) dates the Type D gun from approximately 1730 to 1765, having identified these guns from sites in Oklahoma, Texas, Illinois, Michigan, and Missouri. The Type D gun was prevalent during the French Fur Trade Period. Hamilton (1968:13) believes that, given the materials and workmanship, these guns were not cheap.

The crowned R mark has been found on French triggerguards, sideplates and buttplates, usually on Type D guns. Two versions of the mark have been identified, differentiated on the basis of the crown shape. The mark on 21K66B11-7759 is considered the rarer of the two. Hamilton listed sites—Texas, Mississippi, Michigan, Illinois, and Missouri—where the crowned R is known. Three interpretations of the mark have been suggested: (1) *acceptance marks*, (2) *arsenal marks*, and (3) *a King's mark* (Hamilton 1980:39).

The early dates of the Type D gun (1730–1765) are problematic given Fort Gibraltar's period of occupation (1810-1816). Four hypotheses can be considered.

1. Guns were frequently restocked so that Type D French furniture may be used to outfit a gun with an English lock and barrel (Hamilton 1976:2; 1980:106,110).
2. Decorative gun furniture was reused as items of personal adornment, particularly as pendants. The use of trigger-guards in such a manner has been documented (Carter 1973:192; Hamilton 1976:13; C. S. Reid 1991:pers. comm.).
3. The gun may have been in use for many years, given the difficulty and expense of obtaining a replacement.
4. The artifact was recovered from an apparently undisturbed stratum below the Fort Gibraltar I occupation and may represent an earlier Fur Trade period occupation of the site.

6.1.2 Gunflints

Two spall gunflints were recovered from the 1991 excavations. Both were found in Fur Trade levels. 21K63F3-8948 was recovered from the ash deposit, Feature W. 21K57R10-10926 was recovered from a unit adjacent to Feature Q, which also contained many small lithic flakes.

Spall gunflints have been described as "spalls struck individually from the surface of the nodule of flint. A typical spall gunflint bears a bulb of percussion on the upper conchoidal surface in the area of the heel, with the face sloping down to the edge" (Hamilton and Fry 1975:107). Spall gunflints have also been termed gunspalls, flintspalls, Dutch, wedge-shaped, or Clactonian gunflints. Both 1991 gunflints can be classed into Stone's (1974:255) Series C (Spall Gunflints), Type 1 (Wedge Shaped), Variety A (Grey to Brown).

21K63F3-8948 measures 32.6 mm from side to side and 26.8 mm from heel to edge, with a maximum thickness of 8.5 mm (Figure 26a). The material is grey-brown flint, exhibiting some banding. This gunflint represents a spall with the bulb of percussion clearly evident on the upper face. The spall has been retouched to create a blunt heel. Bifacial retouch is evident on the sides and edge. Usewear is visible on three sides, but primarily on the striking edge. The wear consists of small, stepped flake scars, appearing more battered or ground than flaked.

21K57R10-10926 measures 26.2 mm from side to side and 18.0 mm from heel to edge, with a maximum thickness of 5.7 mm (Figure 26b). The lithic material is a translucent brown chalcedony. Small white inclusions are visible. As with 21K63F3-8948, a bulb of percussion is evident on the upper surface. The thicker edge has been retouched into a blunt heel. Unifacial retouch extends down the other two sides. The striking edge is thin with some retouch. Small flakes have also been removed through use.

Both gunflints are within the size ranges documented from other sites. 21K57R10-10926 is somewhat uncharacteristic as it is a thin spall, with very little retouch other than that required to create the heel. 21K63F3-8948 is very thick. The heavy usewear on edge and sides, creating small concavities in the edge profile, suggests that this artifact may have been used as a fireflint. This may have occurred following use as a gunflint. The flint edges are extremely dull and resharpening may have been deemed too difficult to be worthwhile, resulting in the discard of this artifact.

Researchers such as Hamilton and Fry (1975), Witthoft (1966), White (1975), Kent (1983), and Blanchette (1975) have created chronologies of gunflint usage, based on the different types. According to these chronologies, spall flint use in North America is considered to be early, from 1650 to 1750 (Witthoft 1966:25; Hamilton and Fry 1975:107). The occupation of Fort Gibraltar I post-dates these time limits. However, Kent's (1983) study of American gunflints reveals a continued usage of spall gunflints into the first quarter of the 19th century. This type of gunflint has been recovered from Fort Edmonton/Fort Augustus (Alberta) dating from 1795 to 1807 (Kidd 1987:40), Rocky Mountain House (Alberta) dating from 1799 well into the 19th century (Noble 1973:119), Fort George (Alberta) dating from 1792 to 1800 (Kidd 1970:74–75), and Grant and McLeod Houses (Saskatchewan) dating from the 1790s (Klimko 1987:37, 59).

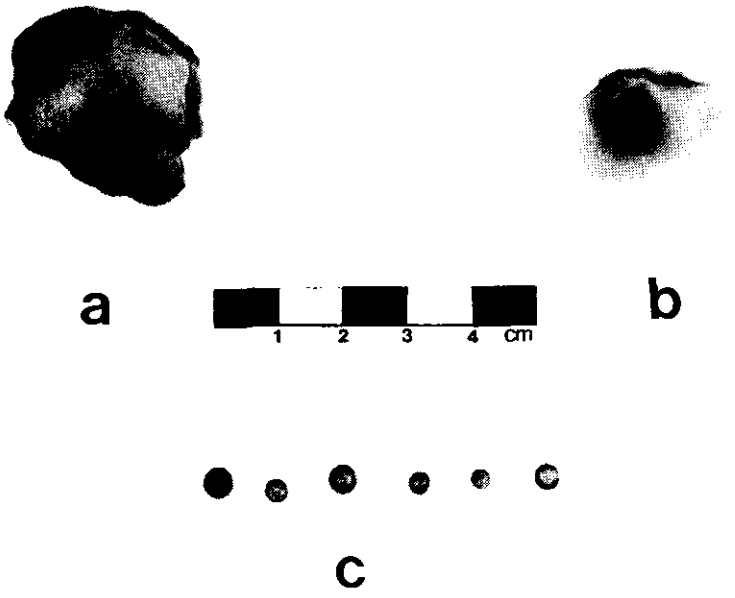


Figure 26: Gunflints and Lead Shot

The use and manufacture of spall gunflints may have extended longer in the Northwest. Chronologies are often based on data primarily from the eastern part of the continent, consequently providing an incomplete perception of variation in artifact types. The presence of spall gunflints in the Canadian sites mentioned may represent a late period of spall gunflint usage, when this type was still present but in diminished quantities. This hypothesis is questionable, however, when one considers that at some of these sites (e.g., Grant and McLeod Houses) the spall type is the only type present.

Another explanation is the local manufacture of gun and fire flints—evidence of lithic tool making has been documented at other fur trade posts in the Northwest. Through contact with Native artisans and the family networks of the Native spouses of *engagés* (company employees), many of the Euro-Canadian fur traders would have learned a basic knowledge of flintknapping techniques.

Suitable lithic materials, such as Knife River Flint, chert or chalcedony, could have been obtained locally or through trade with the Native community. The presence of numerous small flakes in Fur Trade levels (Section 6.6), indicates that lithic tool manufacture occurred at Fort Gibraltar I.

6.1.3 Ammunition

Forty-three pieces of lead shot (Figure 26c) and three incomplete cartridge cases were recovered from the 1991 excavations. The cartridge cases were recovered from the Pre-Railway/Post-Experimental Farm levels. All but two of the lead shot were recovered from Fur Trade levels. These two artifacts may have been relocated by the flood of 1826. Some of the shot is heavily oxidized, obscuring manufacturing details.

Lead shot was used in smooth-bore guns and is a common artifact class of the Fur Trade period. The diameters were measured in both metric and British units to permit comparison with material recovered from other sites. Shot diameters of the 1991 recoveries range from 2.1 mm (0.08 inches) to 5.6 mm (0.22 inches). When sorted by 0.50 mm intervals, the highest frequency occurs in the 4.50 mm–4.99 mm class. The average diameter is 4.15 mm (mode = 4.55 mm; median = 4.25 mm).

More than half (53.5%) of the lead shot exhibit a flattening on one side in conjunction with a small dimple on the more flattened side. These traits are considered characteristic of *Rupert shot*, named for Prince Rupert who publicized this manufacturing process in 1665 (Hamilton 1976:35). Rupert shot from Fort Michilimackinac, Michigan, exhibits a size range of 0.078 inches to 0.217 inches (Hamilton 1976:35), similar to the range exhibited by the Fort Gibraltar I shot.

Noble (1973:122) notes that "smaller 3 mm to 4 mm shot...are convenient sizes for shooting ducks, grouse, pheasants, pigeons. . . . [L]arger shot sizes between 4–5 mm and 6 mm . . . are effective in shooting geese, swans, cranes or small game such as rabbits and beaver." Presumably the smaller sizes (3.0 mm) present at Fort Gibraltar I could have been used on small birds or mammals (e.g. squirrels). Only one of the shot appears to have been flattened by impact.

Four pieces of lead shot display cut marks, where the *mold cast* shot was cut from the mold. Each piece shows two cut marks, meeting at the centre. A fragment of lead sprue, the excess lead left in a ball casting mold, was also recovered from Fur Trade levels. The sprue fragment (21K55Q4-11021) clearly shows where two balls have been cut from the mold—each requiring two cuts to separate the ball from the mold. Two other pieces of shot display at least partial mold seams, again indicating ball mold casting. Lead shot was likely being manufactured on site as well as being imported from the east and/or Europe.

The three incomplete centre-fire cartridge cases represent a later stage of gun technology. A firing pin, activated by the trigger, hits the primer, located in the cartridge base. The primer detonates the gunpowder, allowing the gun to eject the shot.

All three cases consist of a ferrous base with brass above. Heavy oxidation of the bases obscures details and renders measurements inexact. Firing pin marks, visible on the primers, indicate that in each case the gun had been fired.

Two of the three cartridge cases recovered during the 1991 season are very similar. 21K56V2-11752 has a rim diameter of 20.2 mm and a base diameter of 16.9 mm. 21K56V2-11748 represents brass fragments from this cartridge. 21K55X5-9375 has a rim diameter of 20.1 mm, with a base diameter of 17.1 mm. Both are rimmed cartridge case types, corresponding to a 12 gauge shotgun shells. No head stamp is visible on either case. As both cartridge cases were recovered from the same horizon (Pre-Railway/Post-Experimental Farm) in adjacent units, it is possible that these occur as the result of a single activity.

The third cartridge case, 21K54N2-9495, is represented by a heavily corroded base fragment. The heavy corrosion inhibits the determination of case type as well as precluding measurement.

6.2 Beads

Beads were a common trade item during the Fur Trade period. As most beads were manufactured of glass, they tend to preserve well, making them one of the largest artifact classes from archaeological sites dating to the Fur Trade Period. The 1991 field season is no exception, with a total of 1318 glass beads, six manufactured shell beads and one polished bone bead being recovered (Table 1).

Bead Type	B&B	Pre-Railway/ Post-Farm	Experiment Farm	1826 Flood	Fur Trade	TOTAL
GLASS DRAWN						
White	2	12		94	989	1097
Ultramarine				5	86	91
Turquoise		2	1	27	36	66
Emerald Green				2	27	29
Black		1		8	9	18
Redwood				3	5	8
Colourless					3	3
GLASS WOUND						
White					5	5
Polychrome					1	1
SHELL/WAMPUM					6	6
BONE					1	1
TOTAL	2	15	1	139	1168	1325

Table 1: Distribution of Bead Types By Event

6.2.1 Glass Beads

Glass beads are the largest class of trade beads represented: 99.5% of the total sample. Beads were one of the earliest types of trade goods introduced by the French during the early 17th century. The first beads intended for the North American fur trade were large beads. Later, smaller types known as "pony" or "seed" beads were introduced (Armour 1977:10).

Beads were popular items with the traders due to their small size and ease of transportation. They could be sold by the pound, packed in casks and barrels, or by the string (Woodward 1965:9). A study of the Upper Great Lakes region discovered that the prices fetched by beads decreased with time, presumably as Native groups became more familiar with the variety of trade goods (Armour 1977:11). Alternatively, the supply was meeting the demand. Beads were also commonly used by Europeans and Metis. In 1806, the bowsmen and steersmen on North West Company canoes were given beads as a portion of their wages (Armour 1977:23). By 1775, drawn beads were sold at two shillings, sixpence per pound. The larger, wire wound beads, known as "necklace" or "fancy" beads, were more expensive.

Among the Plains tribes, the Crow especially preferred the larger, wire wound beads, using them on necklaces and as "adornment offerings attached to their buffalo medicine bundles" (Woodward 1965:13). West (1966:25), in his descriptions of Native people at the Red River Colony, states that "their ears were cut in large holes, to which were suspended various ornaments, but principally those of beads." It is possible that these were the large wire wound type.

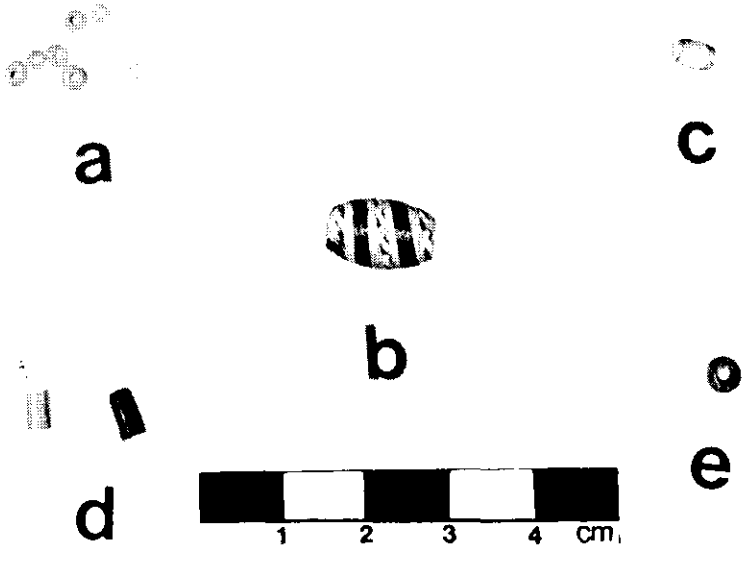


Figure 27: Beads

The smaller seed beads (Figure 27a) were used to decorate fabric or leather, either woven or sewn into patterns. In many areas, white was the most common colour (Armour 1977:12). The recovered beads from the 1991 project support this statement, as 83% are white.

The recovered glass beads represent two different manufacturing techniques and can be divided on this basis into "drawn" and "wire wound" types. Drawn beads are made "from sections of glass tubing . . . drawn out from a hollow globe of molten glass" (Karklins 1985:11). The ends of the beads may be broken and subsequently rounded by heating and/or agitation (Karklins 1985:11). Drawn beads account for 99.5% of the glass bead sample. While white is the most common colour, six other colours are also present (Table 1). The beads vary in their diaphaneity; some are opaque, others translucent, while the colourless beads are transparent.

The eight redwood beads are *Cornaline d'Aleppo* beads, which are characterized by distinct differences between the exterior and interior finishes (Woodward 1965:19). Those recovered from Fort Gibraltar I are dull opaque red on the exterior, with a translucent green interior. Woodward (1965:20) believes that this style is more commonly recovered from 17th and 18th century sites. Sprague (1985:94) notes that the use of Cornaline d'Aleppo beads in western North America had diminished by 1830.

Until the first half of the 19th century, most of the beads imported to North America were produced in factories on the island of Murano, Venice (Good 1977:28). The wire wound fancy beads, in particular, are generally considered to be Venetian in origin. Woodward (1965:19) notes, however, that during the early 1800s, raw glass tubes, ready for cutting into fancy beads, were shipped to Bristol, England to be finished.

As the term suggests, wire wound beads were produced by "repeatedly winding a filament of glass around a rotating mandrel until the desired size and shape were achieved" (Karklins 1985:19). Spiral designs are characteristic of wound beads and are evident on 21K54R9-8409 (Figure 27b), one of the six wire wound beads recovered during the 1991 season. This "fancy" bead is made of blue glass, encircled by spirals of red and white twisted cane and gold inlay. Visible winding lines around the perforations suggest a smoothing process using an open-ended pincher, considered indicative of Venetian manufacture (Francis 1983:194). 21K54U5-4498, recovered during the 1990 project, is identical to 21K54R9–8409. Similar bead types have been recovered from Brandon House (M. Brown 1991:pers. comm.), York Factory, and at the North Point Mitigation Project at The Forks (S. Thomson 1991:pers. comm.).

Five smaller, barrel-shaped beads make up the rest of the wire wound sample (Figure 27c). Opaque white in colour, this type has been termed "barleycorn" and corresponds to type Wlcl in the Kidd classification scheme (Kidd and Kidd 1970:62). Barleycorn beads have been recovered from many 18th and 19th century sites (Good 1983:163). In western Canada, they have been recovered from Grant and McLeod houses in Saskatchewan (1793–1795) (Klimko 1987:32) and Fort George, Alberta (1792–1801) (Kidd 1970:173). In 1775, at Fort Michilimackinac, barleycorn beads were sold for one shilling, four pence per pound (Armour 1977:11).

While glass bead preservation is generally quite good, each colour appears to deteriorate in a specific way. White beads generally preserve best. Turquoise beads tend to display pitting and wear, obscuring the translucence. Emerald green beads develop a heavy brown patina making colour identification difficult and opaque black beads, actually a dark purple, develop a surficial film or bloom. The barleycorn beads appear to flake off by the wire wound layers.

6.2.2 Shell Beads

Six beads are made of shell (Figure 27d). These beads are also known as *wampum*—cylindrical beads made from the Northern Quahog shell (*Mercenaria mercenaria*) (Kroker *et al.* 1991:67). The recovered colours range from ivory, through light purple to one specimen (21K57U8-11902) that is dark grey-black.

Wampum was originally Native-made but "once its potential use in trade was evident to the Europeans, it was taken over and manufactured by them" (Armour 1977:16). Nearly all wampum used in the North American fur trade came from New York and was manufactured in black and white. Black wampum beads were considered to be worth more than the lighter coloured specimens (Armour 1977:16). West (1966:48–49), while staying at Fort Daer, observed an event which shows how the Native groups of this area regarded the use of wampum. A Native man, upon receiving ammunition for a war party against the Sioux, leaves his "wampum, or belt, at the Fort as a pledge that he would return and pay the value of an article which was given to him at his request. They consider this deposit sacred and inviolable, and as giving a sanction to their words, their promises and their treaties."

6.2.3 Bone Beads

One bone bead was recovered during 1991. 21K64C8-7763 is a smoothed, polished round bead, 3.9 mm long and 4.5 mm wide (Figure 27e). The artifact corresponds to Stone's Series A (single hole) Type 2 (round, undecorated) for rosary beads, but is smaller than his three size categories (1974:114–115).

The comparative literature generally uses the term "bone bead" to mean a cut and polished bone shaft, usually from a large bird. These have been considered as beads, gaming pieces, or hair tubes. Stone's description of rosary beads from Fort Michilimackinac is the sole mention of beads similar to 21K64C8-7763.

6.3 Buttons

Portions of 13 buttons were recovered during the 1991 field season. Seven buttons are metal, three are glass, one is hard rubber, one is bone, and one is clay.

Two buttons were recovered from Fur Trade levels. The first, 21K64C10-9010, is an incomplete vertical-hole type, made of bone (Figure 28a). Portions of three holes are evident as well as a slight depression in the centre, presumably created by the manufacturing tool. The location of the holes as well as the cross-section profile suggest that 21K64C10-9010 originally had four holes. The rim, sides, and back of the button are ivory in colour. The button centre and the incised line that encircles it are stained dark brown. This staining is also visible in the holes. The back of the button is flat. The centre face is depressed, presumably to reduce wear on the threads that held the button in place. The thickness is 2.5 mm at the rim and 1.5 mm at the centre.

Bone buttons do not provide temporal periods, as they are present on archaeological sites dating from the mid-1700s to the early 1900s (McLeod 1983:223). The majority of bone buttons recovered from late 18th century and early 19th century Fur Trade sites are one-hole button backs. Buttons similar to 21K64C10-9010 have been recovered from Area A of Delorme House, dating later than 1874 (McLeod 1982:83).

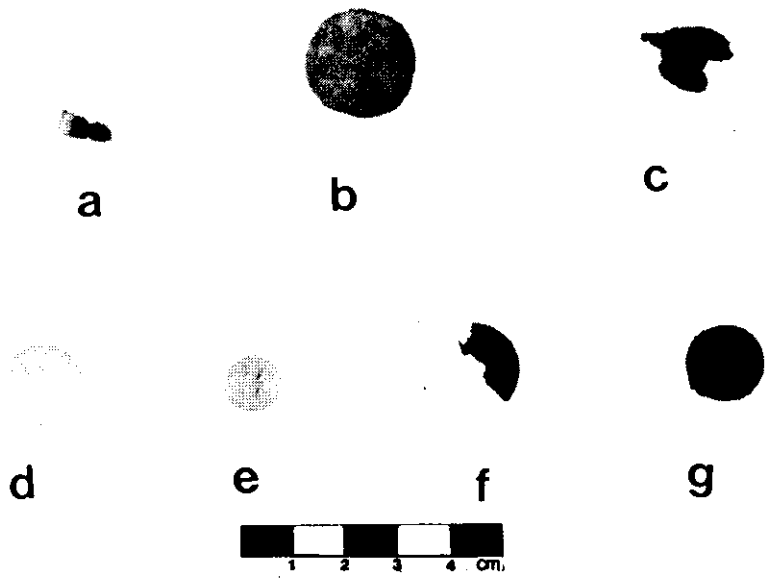


Figure 28: Buttons

The second button (21K63F3-11830) recovered from Fur Trade levels is a clay button filler (Figure 28b). More commonly made of wood, bone, or horn, a filler was the base over which textiles or thin metals were fitted as coverings (Woodhead 1978). While these resultant 'mold buttons' were most common during the 17th and 18th centuries, their use extended into the late 19th century as they were inexpensive and simple to make (Woodhead 1978).

At Fort Michilimackinac, Michigan, Stone (1974) classifies clay button fillers as Category 2, Type 1. These are similar in appearance to, but much smaller than, 21K63F3-11830. 21K63F3-11830, with a diameter of 21.5 mm and a maximum thickness of 7.3 mm, has a flat back and a domed face. The orange colour of the clay indicates heat modification. As the artifact was recovered from Feature W (ash pit), it is difficult to determine if it was fired during manufacture or burned after being discarded. No portion of the covering has been preserved.

A ferrous stud-back button, 21K57Q1-9513 (Figure 28c), was recovered from the undifferentiated layers attributed to the Pre-Railway/Post-Flood period (1826–1888). The face diameter is approximately 18.4 mm. Letters and numbers are barely visible on the rivet back—possibly ". . . . 18 MOU . . . ." The rest of the inscription is obscured by rust.

Four buttons were recovered from the Pre-Railway/Post-Experimental Farm layers (1847–1888). All are 4-hole sew-through buttons. Three of these are opaque white glass buttons, while the fourth is manufactured of *hard rubber.*

The first glass button, 21K53Q3-8575, is circular, with a recessed centre (Figure 28d). Pitting is visible on the centre back. The diameter is 15.7 mm, with a maximum thickness of 4.0 mm. The second specimen, 21K63C2-8508 (Figure 28e), is circular, with a concave face and a convex back. It is 11.0 mm in diameter with a maximum thickness of 3.4 mm. The third glass button, 21K54W2-10036, is a fragment of a circular button, similar in style to 21K63C2-8508. The face is concave, the back convex. Portions of three of the four original holes are present, with pitting around these holes visible on the back. The thickness is 2.7 mm.

The fourth button (21K53U2-11822) recovered from Pre-Railway/Post-Experimental Farm levels is a hard rubber fragment (Figure 28f). It is dull grey with a convex back. The raised rim encircles an impressed line. The round central portion exhibits some stippling. The inside of the button is friable, while the exterior is relatively smooth and hard. The diameter is unmeasurable and the maximum thickness is 3.9 mm.

At least six buttons were recovered from Railway levels (1888-1988). 21K53Y1-8407 is a solid cast brass button (Figure 28g). A lemon-shaped area on the centre face encloses embossed lettering of which only ". . . &B" is visible. Inscribed letters, possibly representing "LN," are also evident on the outer edges of the face. The face is domed while the back would originally have contained a ferrous metal shank. The button may have been plated. Solid cast brass buttons have been made since the 18th century (Peacock 1978:12–14). Railway buttons, inscribed with company initials, were often worn by railway employees (Perry 1959:26). It is possible that 21K53Y1-8407 is this type. Dating of the button may be possible after conservation and cleaning expose the entire inscriptions.

21K53Q2-9381 consists of nine ferrous fragments, representing a minimum of 5 buttons and a maximum of nine. While heavily oxidized, these appear to be circular screw stud-back buttons. The slightly raised edges appear to be crimped. Two size groups are present, based on face diameters. One is made up of buttons with diameters of 17.9 mm, 17.9 mm, and 18.2 mm. Diameters of the second group are 15.7 mm and 15.2 mm. Buttons of similar type and size have been recovered from the late 19th century Delorme House (McLeod 1982:86, 89).

6.4 Glass

During the 1991 excavations, 277 glass sherds were recovered. These derived from objects other than windowpane (Section 6.4.2) and buttons (Section 6.3). One clear specimen (21K56N5-11147) is the scalloped edge of a lamp chimney. 21K57Q3-9367 is a clear molded sherd identified as either the base of a wine glass or the base/body junction of a saucer. The remainder represent portions of broken glass containers (i.e., bottles and jars). Often, individual portions of a bottle (Figure 29) can provide information regarding manufacturer, manufacturing technique and/or date of manufacture.

6.4.1 Glass Containers

The upper horizons yielded the majority of the specimens, especially the Pre-Railway/Post-Experimental Farm level (1847–1888). This is not unexpected as during this period the greatest number of people were located in the vicinity. From 1872 to 1885, the immigration sheds and adjacent shanty town were present. By this time, glass bottles were common items, transported into the area by steamboats.

Very few diagnostic artifacts were recovered. The artifacts were sorted by colour and charted by event (Table 2). The red sherd (21K54N6-9236) has a deeper colour than the "ruby flashed" windowpane specimens (Section 6.5.2) and may derive from dinnerware or ornamental glass, rather than a bottle. The blue sherd (21K57P1-9899) is the shade of colour associated with "Milk of Magnesia" or "Bromo-Seltzer" bottles. The emerald sherds are the shade of green associated with "7-Up" and other soft drink bottles.

COLOUR	Railway	B&B	PreRailway/ Post-Farm	Pre-Railway/ Post-Flood	Experiment Farm	1826 Flood	Fur Trade	Disturbed Context	TOTAL
Clear	2	13	46	2	8	21	2	6	101
Amethyst		1	1						2
White	1		1						2
Red							1		1
Blue								1	1
Amber	1	2	13	4	1	2	1	1	25
Brown		1	1		1				3
Olive	1	4	5	1	1				12
Aqua		3	16		1	1	7	1	29
Pale Green	3	7	35	4	7	4	9		69
Green		1	23		1				25
Dark Green	2					1			3
Emerald	1		2						3
TOTAL	11	32	143	11	20	29	20	9	275

Table 2: Frequency of Bottle Glass By Colour and Event

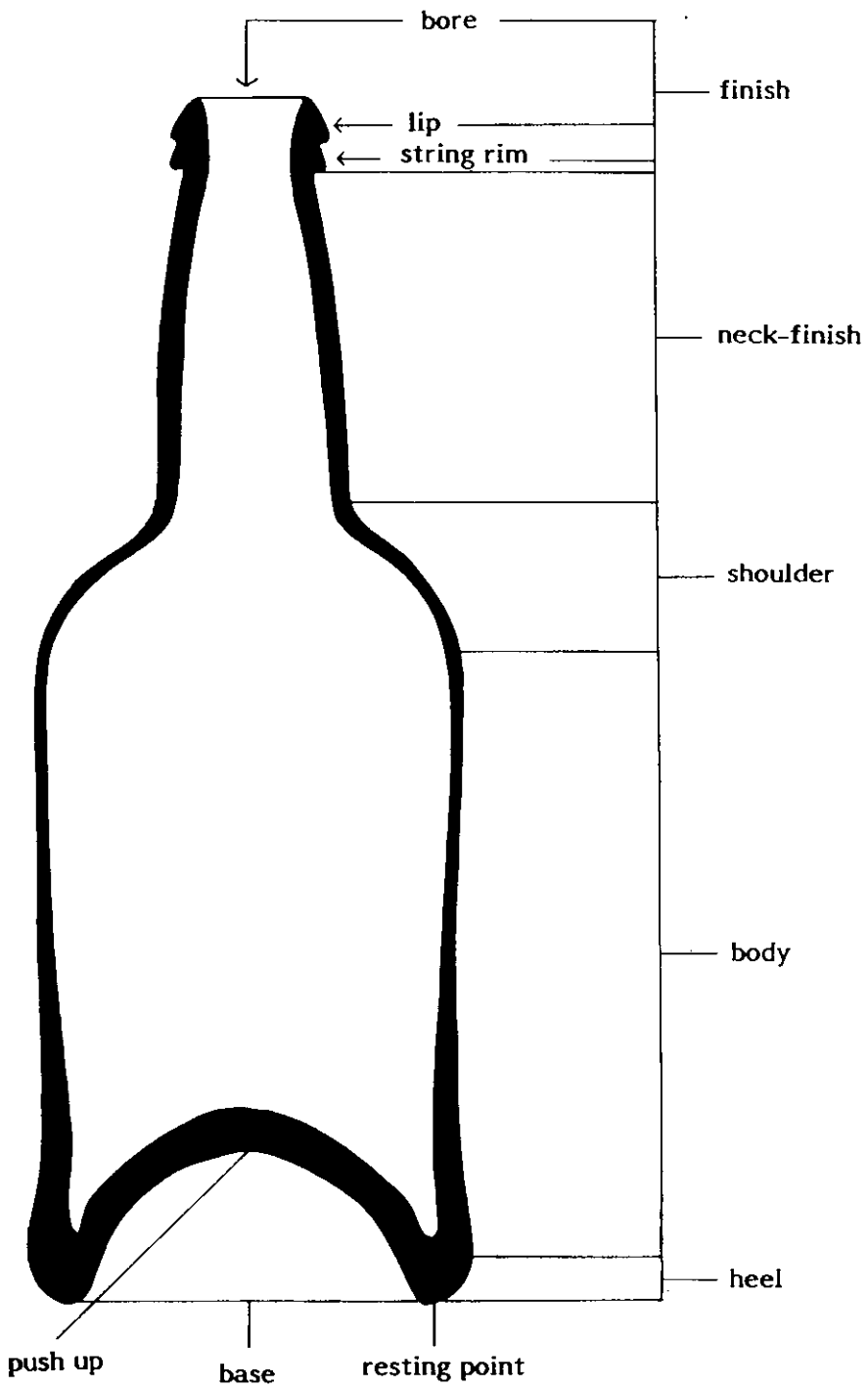


Figure 29: Parts of a Bottle

Dark olive glass was often used for liquor bottles and some types had a square cross-section, which resulted in less breakage and cheaper shipping costs than when round bottles were packed into a crate or case (Klamkin 1971:83). These case bottles often were decorated with closely-spaced vertical lines, as is 21K56V1-11754, a dark olive body sherd derived from the B&B Construction level.

Another sherd (21K54P2-8558) also has vertical ribs, demarcating narrow panels. The curvature of this aqua sherd suggests that the specimen represents the neck portion of a bottle.

Only three artifacts are embossed. None of these markings are sufficiently complete to permit identification of the product or manufacturer. A clear body sherd (21K53R3-7794) has part of a vertically-oriented floral design (Figure 30a). The artifact derives from the Pre-Railway/Post-Experimental Farm level and may represent a perfume or toiletry bottle. The same horizon yielded 21K56Q1-8523, a pale green flat body sherd with a portion of a capital letter—"M," "N," or "W" (Figure 30b). The original container may have been a panelled bottle filled with patent medicine. The third sherd, 21K56W4-7917, is embossed with a mirror image of the letters ". . . WIN . . ." and part of another letter (Figure 30c). The embossing is on the slightly concave face of the clear plano-convex sherd. The specimen probably is a base sherd wherein the text is meant to be read through the container. Examination of references, such as Chopping (1978) and Stock (1978), concerning known bottles associated with Winnipeg firms did not find any similar markings. As the sherd derives from the Experimental Farm level, the similarity between the marking on the sherd and the city name may be coincidental.

Some of the sherds had evidence of manufacturing processes. 21K54P1-8565 is a clear body/base sherd formed in a *cup bottom mold* (Jones and Sullivan 1985:45), while 21K63E1-10078, also a clear body/base sherd, does not have a basal mold seam, suggesting manufacture in a *Ricketts-type mold* or a *post bottom mold* (Jones and Sullivan 1985:29, 45). 21K56P3-8126 is a portion of the base of a green bottle with a large *mamelon* in the kick-up (Figure 31a) (Jones and Sullivan 1985:87, 112). Large mamelons are indicative of wine and champagne bottles.

One amber neck/shoulder sherd (21K53T2-7878), deriving from the Pre-Railway/Post-Experimental Farm level, has a horizontal seam at the neck/shoulder juncture, denoting machine manufacture. Other sherds with mold seams only indicate that these bottles were not free-blown, as mold seams are present on blown-in-mold and machine-made bottles.

Several recovered sherds are portions of lips or finishes (Figure 31). The most complete specimen can be formed by fitting 21K56V3-11740 and 21K56V4-11731 (Figure 31b). The composite makes up half of a flattened side lip. The aqua sherds indicate that the lip was applied to the neck of the bottle, producing a stopper finish, which would have been closed with a glass stopper and a cork shell (Jones and Sullivan 1985:56, 151). These two sherds were recovered from the Pre-Railway/Post-Experimental Farm level and Experimental Farm level, respectively. A small aqua lip sherd, 21K54P3-9208, from the Pre-Railway/Post-Experimental Farm level has the same colour and lip thickness as the preceding two sherds and probably derives from the same bottle. Another small aqua lip sherd (21K53U3-9708) is slightly paler and has a slightly wider rim thickness, thus representing a different bottle (Figure 31c).

A clear lip sherd, 21K57Q1-9515, has a mold seam immediately below the bottom of the flattened side lip, indicating machine manufacture (Figure 31d). A similar clear sherd (21K55W3-7700) is too incomplete to determine type of manufacture. 21K53N3-9683 is a

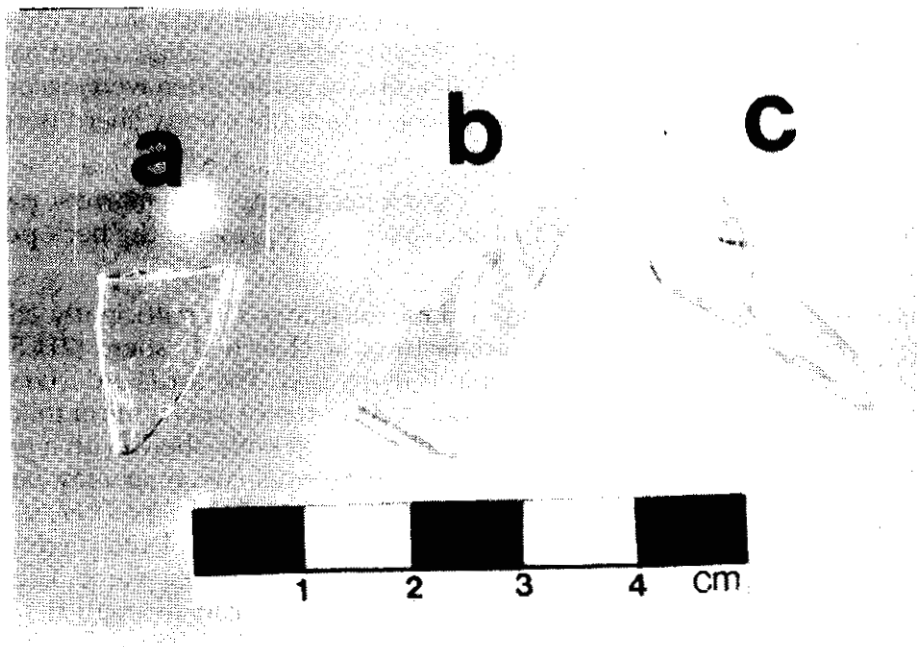


Figure 30: Embossed Glass

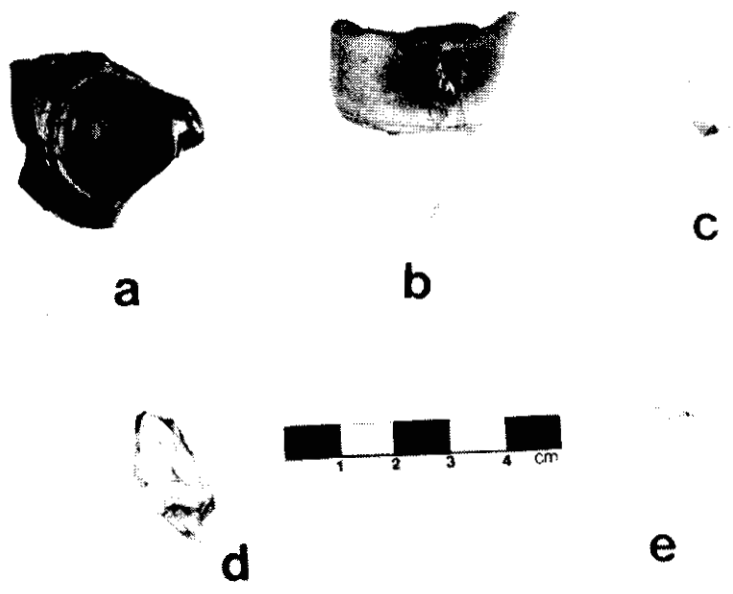


Figure 31: Mamelon and Finishes

small clear rim sherd from a lip that extends outward from the neck (Figure 31e). This style of lip is variously called flanged (Jones and Sullivan 1985:91), narrow round extract (Sydenham 1908:4) or square ring (Stevens 1967:138). Lip sherd, 21K57U3-8319, is a straight-sided specimen with a rounded lip. This slightly amethyst sherd is very thin and probably represents a tumbler or wine glass.

6.4.2 Window Glass

During the excavations, 466 fragments of glass window pane were recovered. These were located in all event horizons (Figure 32). As would be expected, the preponderance derived from upper levels.

Two varieties of fancy glass were recovered during the excavations: nineteen opaque white glass sherds and fourteen "ruby flashed" sherds. A sherd from an opaque white glass pane (21K63B2-7745) was recovered from the Pre-Railway/Post-Experimental Farm level in unit 63B. Eighteen white sherds (21K55P1-8231) were recovered from a disturbed context in unit 55P. These were reconstructed into the corner portion of a pane. The single sherd has a thickness of 2. 6 mm while the other specimens are 2.9 mm thick. White window glass is listed as a stock item in the 1909 Ashdown Hardware catalogue (Ashdown 1909:1442).

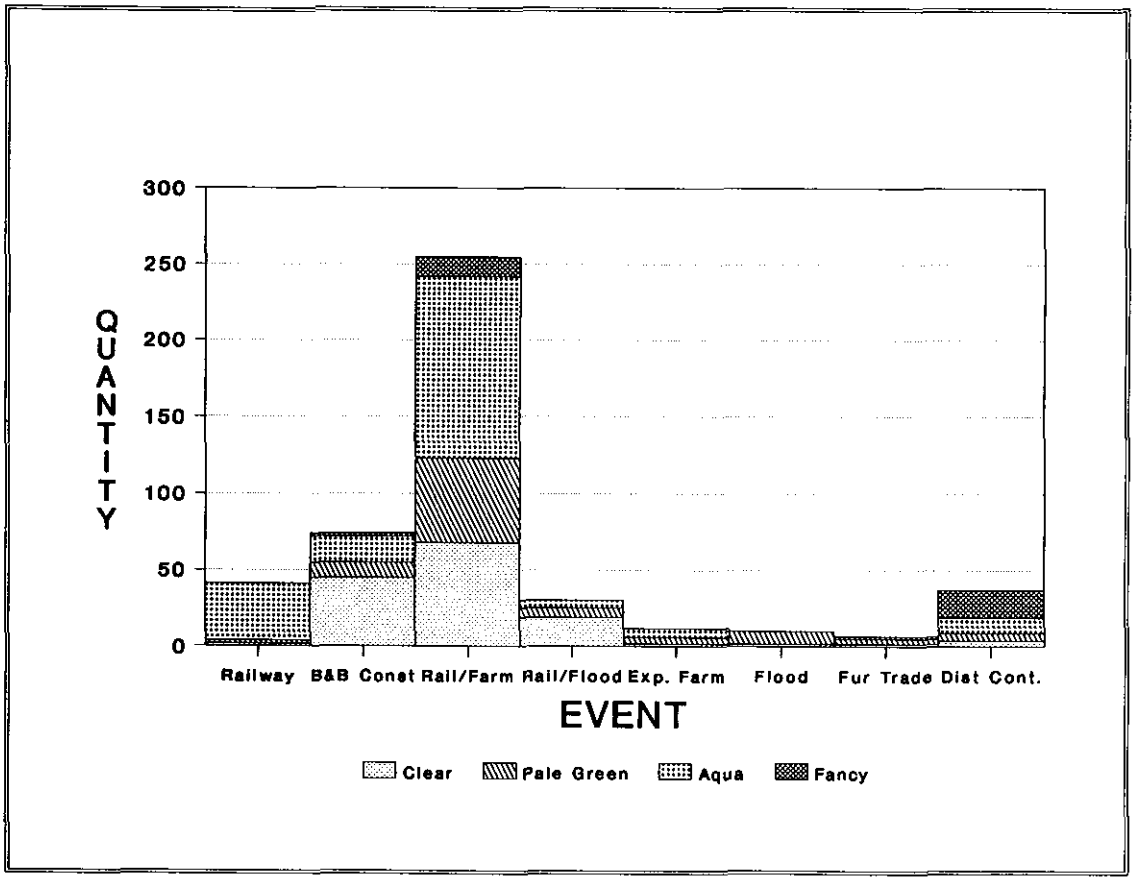


Figure 32: Window Glass Recoveries by Event

The same catalogue offers a "ruby flashed" window glass (Ashdown 1909:1442), which is clear glass with a very thin surface layer of translucent bright red glass. Fourteen sherds of this type of window glass were recovered from the B&B Building and the Pre-Railway/Post-Experimental Farm levels. The specimens all measured 2.9 mm in thickness.

The remaining 433 sherds have been analyzed as a group, by colour and thickness (Table 3). Three distinct colour shades are discerned. Clear specimens are transparent, the pale green has a faint greenish tint, and aqua refers to glass that has a blue-green tint. Aqua encompasses several chroma (shades) ranging from a light greenish blue to a relatively dark bluish green—almost turquoise. Patinas, ranging from faint to heavy, were observed. Minimal trauma, other than shattering, was noted, although some specimens, notably 21K5N2-8179, exhibited crazing and other heat-related effects.

	Railway	B&B Construct	Pre-Railway/ Post-Farm	Pre-Railway/ Post-Flood	Experimental Farm	1826 Flood	Fur Trade	Disturbed Context	TOTAL
CLEAR									
1.5-2.0 mm	1	43	57	1	1	-	1	1	105
2.1-2.8	-	-	9	1	-	-	1	3	14
2.9-3.6	-	1	1	17	-	2	-	-	21
3.7-4.4	1	-	-	-	-	-	-	-	1
4.5-5.2	-	1	1	-	1	-	-	-	3
Subtotal	2	45	68	19	2	2	2	4	144
PALE GREEN									
1.5-2.0	-	3	13	-	2	5	-	1	24
2.1-2.8	1	3	26	2	-	3	2	2	39
2.9-3.6	1	1	15	4	2	-	-	2	25
3.7-4.4	-	3	-	-	-	-	-	-	3
4.5-5.2	-	-	1	-	-	-	1	-	2
Subtotal	2	10	55	6	4	8	3	5	93
AQUA									
1.5-2.0	-	-	-	-	-	-	1	-	1
2.1-2.8	-	3	3	-	-	-	-	-	6
2.9-3.6	3	6	42	5	6	-	-	10	72
3.7-4.4	34	8	74	-	-	-	1	-	117
4.5-5.2	-	-	-	-	-	-	-	-	-
Subtotal	37	17	119	5	6	-	2	10	196
TOTAL	41	72	242	30	12	10	7	19	433

Table 3: Thickness of Window Glass Sherds

The analytic thickness ranges were arbitrarily chosen, although predicated upon two assumptions:

1. thickness would have been based upon the Imperial measurement system, and
2. variations would occur during manufacture due to changing pressure of the roller and viscosity of the glass.

Accordingly, increments of thirty-seconds of an inch were used. These were translated into the equivalent metric units and a range on either side was established.

Table 3 demonstrates that the majority of the clear fragments fall within the thinnest range, the pale green sherds are slightly thicker and most of the aqua specimens fall into the middle range. These frequencies are illustrated in Figure 33.

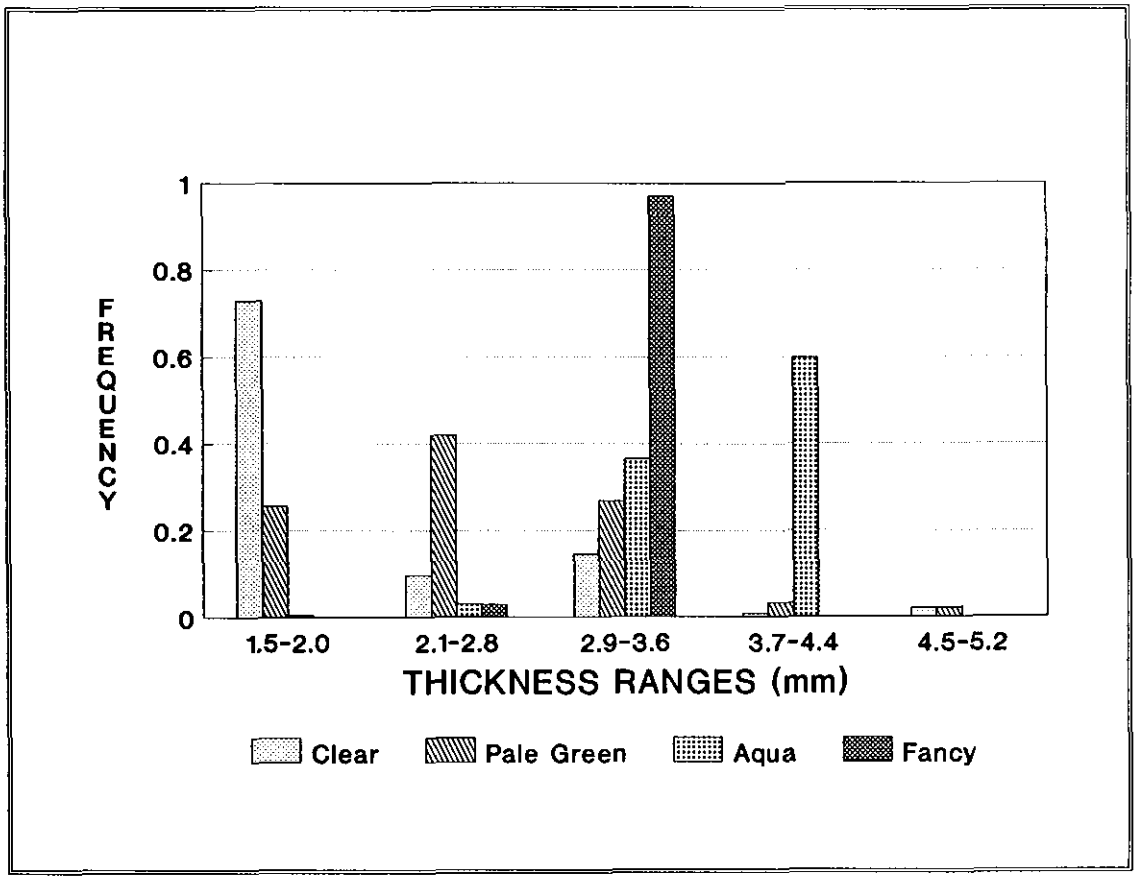


Figure 33: Frequency of Window Glass Thickness by Colour

The data appear to indicate that clear glass was used for the manufacture of the thinnest windowpanes while aqua was used for thicker panes. As well, the thickness of the glass may result in a faint tint (like the pale green) becoming more evident than it would be in a thinner specimen.

It must also be noted that this category may be over-represented, especially in the thinner ranges. Small sherds deriving from thin-walled, flat-sided bottles are indistinguishable from windowpane, unless a mold seam is evident. The quantities for each event may include specimens which derive from higher or lower levels as relocation can occur through rodent disturbance, *cryoturbic* action, or frost and drying cracks.

6.5 Historic Ceramics

A total of 82 ceramic artifacts were recovered in 1991. This total includes 14 fragments of brown glazed sewer pipe associated with the Railway and B&B Construction periods. The largest sewer fragments were found in the south wall clean-up of unit 65E, the source of many similar specimens recovered in 1990. In addition, there are 19 stoneware sherds, three porcelain sherds, 39 earthenware sherds, one reworked earthenware artifact, and six brick fragments (Table 4).

6.5.1 Stoneware

Specimens representing three types of ware were recovered: Improved Glaze, White North American; Improved Glaze North American; and Fine Stoneware (Parks Canada 1982). Improved Glaze, White North American ware has a fine, hard texture that ranges from creamy white to white in colour with a glossy, opaque white glaze present on the interior and exterior of vessels. Improved Glaze North American ware is coarse-textured and buff or grey-buff in colour with a clear glossy glaze present on the vessel interior and exterior, which is brown to black and speckled with iron impurities. The Fine Stoneware ware is very fine-textured with an opaque white glaze. The sherds could represent jars or crocks, common items manufactured of these wares. The production of these wares begins in the 1800s and continues into the 1900s.

Fifteen sherds, representing two vessels, were identified as Improved Glaze, White North American. Ten sherds, from Post-Experimental Farm levels (units 56Q, 56P, 57Q, and 57R), are assigned to one vessel. Nine are body sherds and one (21K57Q1-9522) may be a base fragment. Five sherds, representing a second vessel, were found in units 63B, 63D, 63F, 64B, and 64D. All are body sherds, the largest measuring 15 mm x 20 mm.

Two sherds, identified as Improved Glaze North American, were found in Pre-Railway/Post-Experimental Farm levels. They may be from the same vessel, possibly a jar. 21K57Q1-9576 is a large beige-coloured body sherd measuring 64 mm x 42 mm x 8 mm thick. 21K56Q1-8530 is part of a circular lid (Figure 34a). It has an outer dimension of 54 mm and, when complete, would have had a diameter of approximately 13 cm. This fragment has a raised concentric flange (4–6 mm wide) starting 7 mm from the outer edge. The sherd has a maximum thickness of 13 mm, thinning to 4 mm toward the inner edge.

A body sherd (21K53V2-9937) and a shoulder fragment (21K63D1-8694) are Fine Stoneware. They are from Pre-Railway/Post-Experimental Farm levels and are probably from the same vessel. Both have a white glaze.

	Railway	B&B Construct	Pre-Railway/ Post-Farm	Experiment Farm	1826 Flood	Fur Trade	Disturbed Context	TOTAL
Bricks			4	1			1	6
Sewer Pipe	13	1						14
Stoneware	1	2	12	1		2	1	19
Porcelain			3					3
Cream Colour Earthenware						8		8
Vitrified Earthenware			1					1
Transfer-printed Earthenware		1	7		2	1	1	12
Plain White Earthenware		3	10	1	1	3		18
Reworked Earthenware						1		1
TOTAL	14	7	37	3	3	15	3	82

Table 4: Distribution of Historic Ceramics

6.5.2 Porcelain

Three porcelain sherds were recovered from Pre-Railway/Post-Experimental Farm levels 53R3, 55N3, and 63B2. They have a white glaze on the interior and exterior. Two are body sherds, while 21K55N3-9692 is a rim fragment with a rounded lip (Figure 34b). This rimsherd, which measures 22 mm x 16 mm x 3 mm thick, is probably part of a plate.

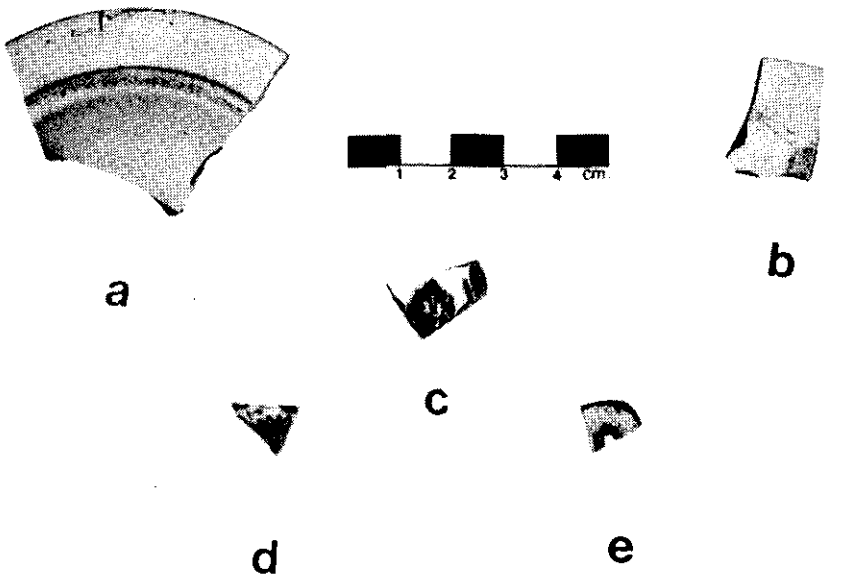


Figure 34: Historic Ceramics

6.5.3 Earthenware

This category includes sherds made of cream coloured earthenware (8), vitrified white earthenware (1), fine white earthenware with transfer printing (12), plain fine white earthenware (18), as well as the reworked earthenware artifact (Table 4).

Cream coloured earthenware is represented by eight sherds from Fur Trade levels 55Q4, 55T7, 55V7, 55W7, 56V7, and 57R7. They are glazed on the interior and exterior with a characteristic light yellowish glaze. The sherds range in size from 5 mm x 5 mm to a rim sherd 12 mm x 18 mm x 3 mm thick. Body sherds 21K55V7-11289 and 21K55W7-11422 were refitted. All sherds are from the same vessel, perhaps a cup or bowl. Vessels of this ware, usually tableware, were produced from the 1740s to the 1820s (Parks Canada 1982).

The vitrified white earthenware (Ironstone) sherd, 21K54X3-8258, was recovered from the Pre-Railway/Post-Experimental Farm event. This basal sherd (15 mm x 13 mm) has a portion of a manufacturer's mark, a lion's head wearing a small crown (Figure 34c). This

is most similar to the Royal Arms crest that appears on Royal Ironstone China produced by Alfred Meakin after 1897 (Godden 1964:425), although it is too incomplete for positive identification. A similar manufacturer's mark is present on a sherd from Delorme House, Manitoba (McLeod 1982:36). 21K54X3-8258 is the only one recovered during the 1990 and 1991 excavations that has a manufacturer's mark.

The fine white earthenware sherds include twelve that are underglaze *transfer-printed.* All are too small for pattern identification. Four of these sherds have portions of a similar blue-on-white floral pattern. The largest (21K53V2-9939) measuring 10 mm by 10 mm, is decorated on the interior and exterior (Figure 34d). The other three sherds are split and, subsequently, the pattern is present on only one surface.

Six sherds, from Pre-Railway/Post-Experimental Farm levels (units 53P, 54W, 56X, 57U, 63D, and 63F) are decorated with different blue transfer-prints. 21K54N5-11857 is a dark blue sherd found in the 1826 Flood level. Sherd 21K57N2-11859 from a Fur Trade level is 3 mm square and has a black decoration.

Eighteen sherds are plain white glazed earthenware. 21K63E2-9619 is a small lip fragment 3 mm x 4 mm in size and 21K55X5-11707 is a shoulder sherd measuring 12 mm x 14 mm. The remaining 16 artifacts are body sherds, undiagnostic as to function. Ten were recovered from the Pre-Railway/Post-Experimental Farm Period.

The reworked artifact (21K63E4-11825) was recovered from the Feature W ash deposit (Figure 34e). This incomplete specimen is made from an earthenware sherd. It has a pale blue glaze on the outer and inner surfaces. Maximum dimensions are 10 x 9 x 4 mm thick. Half of a drilled hole, 2 mm in diameter, is present. The complete shape would have been an irregular circle with a central hole. The circumference is rounded and the interior surface is slightly concave with visible scratch marks. The hole appears to have been enlarged as the glaze around it chipped away. The function of this artifact is uncertain, although possibilities include a button back or a gaming piece.

6.5.4 Bricks

Six fragments of brick were recovered during the 1991 season. One fragment from the B&B Construction event and one from Fur Trade levels are brick red in colour with one or more smooth surfaces. These may be brick fragments, but their small size precludes further identification. 21K53W2-9652, from Pre-Railway/Post-Experimental Farm levels, is only 2. 9 mm thick and may represent a decorative tile rather than a construction brick.

21K57Q1-9511 is a yellowish brick fragment from the Pre-Railway/ Post-Flood period. It is a soft-mud, *sand-struck* brick, measuring 60.9 mm thick and 100.5 mm wide. A portion of the frog is present. Some mortar adheres to the brick surface.

21K54P2-9368, from the Pre-Railway/Post-Experimental Farm event, is a fragment of another yellowish, soft-mud, sand-struck brick. It is 59.1 mm thick and 98.1 mm wide, with a frog that is approximately 52 mm wide.

21K57M1-11631 is a smaller fragment of a yellowish, soft-mud, sand-struck brick, from a disturbed context. It is too fragmentary for measurement.

6.6 Lithic Artifacts

During the 1991 excavations, 373 lithic artifacts were recovered. This total includes the two gunflints that have been discussed in Section 6.1.2

Inasmuch as the Fort Gibraltar I location is an area of fluvial deposition, it is assumed that all lithic material is the result of cultural activity. Even artifacts that show no evidence of human modification would have been brought to the site. The term for such an artifact is a manuport. Specimens of granite and limestone would have been used as structural material for the construction of chimneys and interior hearths during the building of Fort Gibraltar I. Specimens of chert and fine-grained quartzite would have been obtained as raw material for the manufacture of stone tools, such as gunflints, fireflints, and scrapers. Small flakes of these materials are the waste products of stone tool manufacture at the fort.

TYPE	Pre-Railway/ Post-Farm	Pre-Railway/ Post-Flood	Experiment Farm	1826 Flood	Fur Trade	Disturbed Context	TOTAL
GRANITIC	2		2	5	49	1	59
LIMESTONE		8	1	6	139		154
CHERT TOOLS							
Gunflint					2		2
Scraper					1		1
QUARTZITE TOOLS							
Scraper					1		1
LITHIC DETRITUS							
Ochre				1			1
Slate Flake					1		1
Sil. Sed. Flake				1			1
Quartzite Flake	1				4		5
Chert Flake							
Opaque Pink				1			1
Grey-brown				1		1	2
Opaque Grey		1		2	2		5
Opaque White			1	1	1	1	4
Selkirk Chert				2			2
Swan River Chert			1	1			2
Red Brown					1		1
Transl. White				3			3
Knife River?					3		3
Grey-black					5		5
Gunflint-Brown			1	2	102		105
Gunflint-Grey				4	11		15
TOTAL	3	9	6	30	322	3	373

Table 5: Frequency of Lithic Artifacts By Type and Event

As expected, most of the material derives from the levels associated with the fort (Table 5). The artifacts that occurred in levels associated with later events would have been displaced upward by flood action, agricultural activities, rodent disturbances, and frost action. No lithic specimens were recovered in the B&B Construction or Railway levels.

6.6.1 Structural Lithic Material

As noted, the granitic and limestone artifacts would have been brought to the site for building purposes (Figure 35). All specimens show some evidence of having been exposed to heat—spalling, cracking, or discolouration. The granitic specimens ranged from black diorite, through grey granodiorite, to pink granite. The limestone artifacts were generally platy, although heat modification often resulted in angular, irregular specimens.

6.6.2 Lithic Tools

The two gunflints have been discussed in Section 6.1.2. Two lithic scrapers were recovered from the Fort Gibraltar I levels. The first (21K53N6-9216), an incomplete tabular scraper (Figure 36a), is formed from a honey-amber coloured chert very similar to gunflint 21K57R10-10926. The scraper appears to have been broken on both the left and right sides of the working edge. The overall dimensions are: length 13.8 mm, width 14.7 mm, thickness 1.5 mm. The remaining portion of the working edge measures 14.1 mm in width and 2.8 mm in length, with a uniform curvature. The working edge, with an angle of 58°, has moderate rounding and some step-fracturing through usewear.

The second lithic scraper, 21K63E4-11828, is an incomplete specimen made from a blue-grey quartzite (Figure 36b). It has been broken along the central axis at, or near, the mid-point of the working edge. The overall dimensions of the scraper are: length 22.2 mm, width 17.4 mm, thickness 8.3 mm. It is projected that the working edge width would have measured approximately 27 mm and the working edge length approximately 7 mm, as the remaining portion of the artifact has a pronounced curvature. The working edge, with an angle of 72°, has minimal rounding through usewear.

6.6.3 Lithic Detritus

The ochre specimen (21K56P7-8952), a small rounded hematite pebble, does not quite fit this category, although it is residual evidence of human activity. Ochre is a naturally-occurring deposit of iron oxide. It is commonly found as pebbles, in two colours. Limonite has a pale yellow or yellow-brown colour, while hematite has a reddish hue. Ochre was used for decorative purposes; the mineral was pulverized and mixed with a variety of suspending media (e.g., bear grease, fish oil, goose fat). The resultant pigment was used as either a personal cosmetic or general purpose paint for teepees, ceramics, parfleches, etc. In addition, powdered ochre was frequently added to dye mixes as the iron content would assist setting of the dye (Densmore 1974:370–373).

Fur traders imported vermilion, a bright scarlet mercury ore, to replace the lighter coloured natural ochre. The colour of 21K56P7-8952 is a dull red-brown rather than the scarlet of vermilion, thus suggesting it was local in origin. The rounding may be due to water action as the artifact was recovered from the 1826 Flood level.

The manufacture of stone tools results in the production of large numbers of small flakes, the result of shaping the specimens and developing an appropriate working edge—for cutting, for scraping, or for use as a gunflint. Evidence of these activities can be seen on the flakes themselves: a crushed area where the stone had been struck (striking platform), a

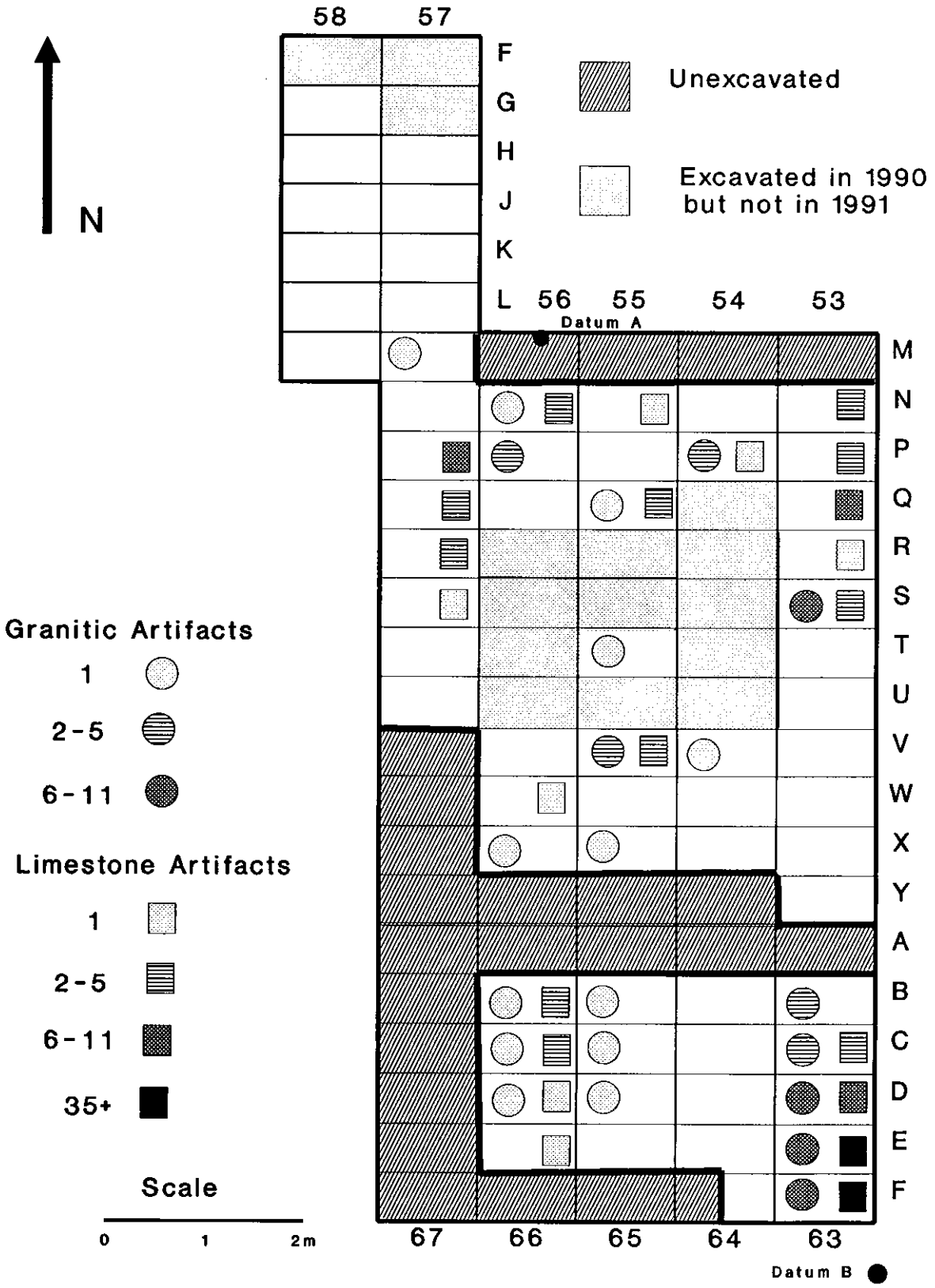


Figure 35: Distribution of Structural Lithics

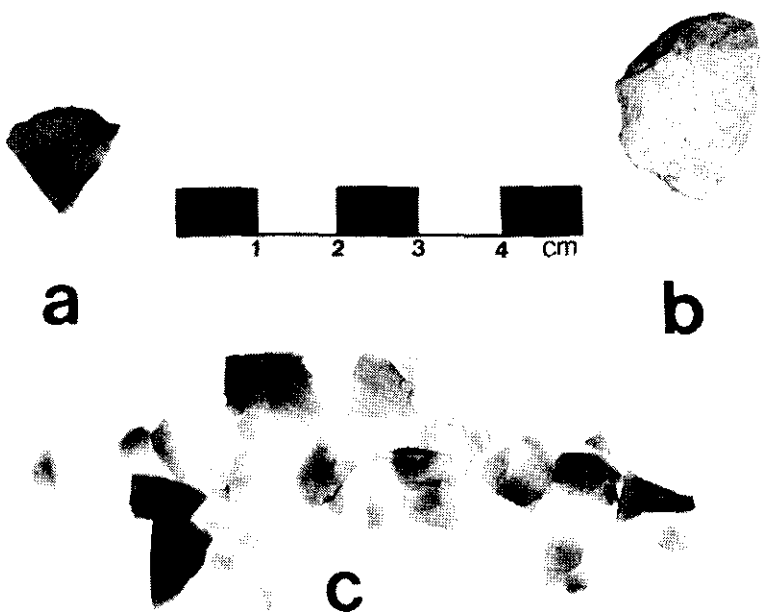


Figure 36: Lithic Artifacts

convex area below the striking platform (bulb of percussion), concentric ridges perpendicular to the length of the flake (conchoidal fracture marks), or vertical micro-fissures (hackle marks). Some flakes show the initial stages of production as they have parts of the outer rind (cortex) of the pebble.

The slate flake (21K63F3-8874) exhibits evidence of conchoidal fracture, suggesting that it was struck from a larger specimen. It was recovered from the Fort Gibraltar I horizon.

A flake composed of micaceous silicified sediment (21K56X5-7755) exhibits evidence of conchoidal fracture. It was excavated from the 1826 Flood level.

Four quartzite flakes were recovered from Fur Trade levels and one was recovered from the Pre-Railway/Post-Experimental Farm horizon. None of the specimens are the same colour or texture as the quartzite scraper. 21K63C4-9248 is a cortical flake with some evidence of heat alteration. 21K57R13-9995 is a small cortical flake with a striking platform. The other three artifacts (21K57S7-9289, 21K57R10-10812, 21K56N4-11178) are incomplete.

The 148 chert flakes (Figure 36c) have been examined as a composite group, based upon the assumption that they derive from the period of occupation of Fort Gibraltar I. For analytical purposes, the artifacts were classed by colour and, where possible, by taxonomic

name based upon the source area, e.g., Selkirk chert (Table 5). The artifacts fall into two broad categories: micro-crystalline, where the individual grains can be seen with a 10x hand lens; and crypto-crystalline, which appears glass-like. Specimens within the first category include opaque pink, opaque grey-brown, opaque grey, opaque white, Selkirk chert—a grainy opaque white chert found in limestone deposits at Selkirk, and Swan River Chert—marked by inclusions of apatite. Representatives of the second category are translucent reddish brown, translucent white, probable Knife River Flint, and translucent grey-black—resembling Gunflint Silica known from sources in northwestern Ontario. The three flakes tentatively identified as Knife River Flint, which is found at quarry sites in North Dakota, are too small for positive identification.

The remaining 120 flakes are crypto-crystalline and translucent amber to pale grey-brown in colour. Most flakes (95) resemble the lithic material of one of the gunflints (21K57R10-10926) while the remaining flakes are similar to the other gunflint (21K63F3-8948). All but one of these flakes were recovered from the northern portion of the excavation area, the exception occurring in unit 66C. Unit 57R, which yielded the gunflint (21K57R10-10926), also produced 99 flakes, while the adjacent unit, 57S, produced 15. The pattern of deposition suggests that lithic tool manufacture occurred in unit 57R, perhaps while the craftsman was sitting in the sun, on the leeward side of the structure represented by Feature Q.

6.7 Fasteners

Twelve inventory numbers, representing 13 artifacts, have been classed as fasteners. Eight of these originate from Pre-Railway/Post-Experimental Farm levels. The remainder were excavated from the 1826 Flood, B&B Construction, and Railway events, as well as from disturbed contexts.

Five fasteners are screws, recovered from 1826 Flood, Pre-Railway/Post-Experimental Farm, and Railway Period levels. All have circular heads, but four are too corroded to identify the head type. The artifact (21K57U6-9193) from the 1826 flood deposits has a slotted head. Lengths range from 22.1 to 69.1 mm; head diameters from 5.7 to 13.4 mm; and shank diameters from 4.6 to 4.8 mm. A tar paper fragment adheres to one of the screws.

Three of four extruded, round-shanked fencing staples were recovered from Pre-Railway/Post-Experimental Farm levels and one from a disturbed context. All are a rounded, shoulderless "U." Lengths of the Pre-Railway/Post-Experimental Farm specimens range from 36.6 to 39.6 mm, while the shank diameters at the base of the "U" range from 3.5 to 4.0 mm. The staple from the disturbed context is larger, having a length of 51.0 mm and a diameter of 4.5 mm. Two of the staples are bent indicating removal from wood.

Two smaller staples from the B&B Construction and Pre-Railway/Post-Experimental Farm events are rectangular in cross-section, suggesting sheet-cut manufacture, and are construction staples. One is a smooth "U" shape and the other appears slightly shouldered, although subsequent damage may have obscured the original form. Lengths are 20.0 mm and 18.9 mm. Shank widths are 4.1 and 5.0 mm respectively.

21K54P1-8567, from Railway levels, is a ferrous bolt with two square nuts threaded on it. The bolt length is 65.8 mm with the shank diameter measuring 20.0 mm. The nuts are 35.1 mm wide and 19.2 mm thick.

The sole cuprous artifact is a brass washer with an exterior diameter of 13.5 mm and an interior diameter of 4.6 mm. It was excavated from Pre-Railway/Post-Experimental Farm levels.

6.8 Metal (General)

This class includes metal artifacts other than nails, fasteners, buttons, and arms and ammunition. The buttons were previously discussed in Section 6.3. While metal containers fall within the CPS class *Containers*, the single recovered specimen, 21K58G14-10636, is described in this section (6.8.4.1.2).

6.8.1 Clothing

Excluding the metal buttons (Section 6.3), only two other artifacts from 1991 can be assigned to this category. 21K53N7-9241, an incomplete brass eye from a hook and eye assembly, was recovered from Fur Trade levels. It measures 14.5 mm long, with a wire diameter of 1.3 mm. Similar artifacts have been documented from Fur Trade Period sites including Setting Lake, Manitoba (Smith and Neary 1991:200), Fort Michilimackinac, Michigan (Stone 1974:81), and Fort George, Alberta (Kidd 1970:126). One of the Fort George examples is identical in the dimensions of the eye and the wire.

The second artifact, from the Pre-Railway/Post-Experimental Farm event, is a bootlace or shoelace hook. 21K55X5-9372 measures 6.9 mm across the hook portion and still bears much of the original coat of glossy black paint. It has snapped where the hook attached to the boot grommet portion.

6.8.2 Adornment

Metallic artifacts that were used for personal adornment or clothing decoration are commonly recovered in Fur Trade sites. These artifacts were trade items as well as personal property of the inhabitants of the trading post. Excavations yielded a pendant, rings, and tinkling cones.

6.8.2.1 Turtle Effigy

One of the more unusual trade items recovered from the 1991 excavation is a pewter turtle pendant, 21K57Q4-9280 (Figure 37). It measures 17.9 mm from head to tail and is very thin in cross section. The head, now broken, appears to have been a loop. The tail is ridged, the legs flat, while the body has a slight raised "X." The turtle back is very slightly rounded, while the belly is a flat, roughened plane. The artifact is covered with a white oxidation.

Flanders (1977:7) states that, in the Upper Great Lakes region, "[p]endants, effigies, and etched outlines of stylized birds and animals from different cultural periods have been found . . . ." Quimby (1966:95) notes that the Pre-Contact levels of a Native village on Lake Superior's north shore "produced a nicely carved beaver effigy of grey dense stone, and beaver effigy pendants made of catlinite have been recovered from Middle Historic period sites along the north shore of Lake Michigan." Animal carvings of bone and catlinite were recovered from the second Potawatomi occupation on Rock Island (1670–1730) (Mason 1986:161–162).

Quimby regards the presence of trade silver as the best single criterion for dating archaeological sites of the Late Historic Period (1760–1820). One of the less common items was

Figure 37: Turtle Effigy

animal effigy pendants—particulary beavers and turtles (Quimby 1966:91–92). Carter (1971a:115), using the term trade silver loosely to include artifacts made of pewter and tin, describes turtle effigies as being used as pendants and sewn on clothing. Both the presence of maker's marks as well as archival data reveal that these items were being manufactured in both Europe and Montreal. These were much better crafted than 21K57Q4-9280.

Quimby (1966:95) suggests that beaver pendants may have been initially manufactured ". . . . in response to native requests" in areas where beaver effigies were a Pre-Contact tradition. This may also be true for turtle effigies, since turtles are powerful spiritual symbols for many Native groups.

The earlier effigy pendants are fairly well-made and detailed, as they were produced by trained silversmiths who had access to superior materials. It soon became common for Natives to create their own stone molds for casting lead or pewter ornaments and shot (Quimby 1966:141; Carter 1971b:142). There is evidence of the use of stone molds for casting metal objects in trade posts in northwestern Ontario (C.S. Reid 1991:pers. comm.).

The use of stone molds does not permit the engraving of fine detail as is possible with metal molds. The preference for softer metals such as lead and pewter may also have contributed to the lesser degree of detail. The softer metals have lower melting points and would likely have been more readily available. Accordingly, the later frontier products can be distinguished by this general lack of fine detail. Based on the metal used as well as the lack of detail, it is suggested that 21K57Q4-9280 was manufactured in a stone mold. The pendant may indicate Native metalworking or the existence of a cottage industry in which North West Company employees manufactured trade items at the post.

6.8.2.2 Finger Rings

One of the most interesting artifact types recorded in 1991 is the Jesuit trade ring. Generally considered to pre-date 1760, the Jesuit trade rings may be anomalous in a fur trade post that dates from 1810-1816. They are, however, also present at Pine Fort (1768–1811) and Fort Rivière Tremblante (1791–1798), both North West Company posts. Two rings (21K53N6-8403 and 21K58G14-9580) were recovered from Fur Trade levels in 1991, while five were found during the 1990 season.

Jesuit rings consist of a single-piece band and flat bezel, which may be round, oval, octagonal, irregular octagonal, or heart shaped (Cleland 1972:202). They are generally found in sites of French occupation or influence, from the middle of the 17th century to the middle of the 18th century (Cleland 1972:202).

The early rings were cast designs with high relief and good detail. The designs used religious symbols, such as IHS (Iesus Hominis Salvator), AM (Ave Maria), MM (Maria Mater), as well as crosses, crucifixion spikes, etc. As time progressed, the rings changed in shape, with the initials—now engraved rather than cast—losing any religious meaning.

Cleland (1972) has attempted to prove that 95% of Jesuit rings in his sample can be traced back to three cast prototypes—IHS, L-Heart, and Double M. He accounts for the changes in the inscriptions through style drift. This could be due to, or accentuated by, many factors including increased (mass) manufacture, copying of copies rather than prototypes, lack of care in copying, and the general level of illiteracy of the period.

Another major factor may have been the change in function of the rings—from religious to secular trade items. As mentioned, the first rings bore well-crafted cast designs with obvious religious significance. While archival research has thus far failed to uncover the details of manufacture, Jesuit documents indicate that initial uses of the rings included:

1. rewards to Natives for learning lessons/scripture,
2. currency, i.e., payment in kind for food and goods, and
3. gifts to hosts in return for hospitality (Hauser 1982:1).

In studying the Great Lakes area, Hauser (1982:42) noted that the rings were "found in great abundance at sites that were primarily trade sites," while relatively small numbers were found at mission sites. Cleland (1972:202) believes that by the second quarter of the 18th century, rings had become secular trade items, although this does not preclude a continued function in religious spheres of influence. Hauser (1982:52) suggests that the reduction in quality may be coincidental to an increase in production, the increase representing the change in function from purely religious to increasingly secular items of trade.

The production of the rings appears to end about 1770, a date that has been correlated with the banning of the Jesuits as a society from North America in 1764 (Wood 1974:83). This would allow for 60 to 70 years of style drift, according to Cleland's hypothesis. Alternative explanations of the incised letters are that they were sets of likely customers' initials (Hume, cited in Cleland 1972:203); or that they were the initials of Native and European trading partners who utilized the rings as items in gift exchanges to promote alliances (Hauser 1982:46). Cleland's hypothesis appears to be the most reasonable although revisions are necessary due to the recovery of new data and expansion of the initial sample.

21K53N6-8403 (Figure 38a) can be assigned to Cleland's IHS series, part of the F-P-D progression (1972:205–206). It is relatively well-made with clearly incised initials "RI." As is commonly the case, the engraving tool has been "walked" across the bezel face in some

areas, creating a zigzag line. This is used to outline the bezel and to create the uprights of the letters. The horizontal incisions appear to run the width of the bezel, superimposed over the zigzagged lines. The bezel itself is a regular octagon, 10 mm by 10 mm. The band is approximately 2 mm wide.

21K58G14-9580 is a heart-shaped bezel (Figure 38b). The initial "N" is incised with zigzag lines across the top. The bezel has not been outlined. This second ring is highly oxidized, obscuring poorly-done incising on an inferior bezel. It can be assigned to Cleland's L-Heart series and his N-ring progression (1972:203–204). The dimensions are: height 9.4 mm; width 10.2 mm.

Both of these rings are similar, but not identical to examples illustrated in Wood (1974), Mason (1976), Cleland (1972) and Hauser (1982). Cleland (1972:207) believes the change to octagonal and heart-shaped bezels occurs after 1700, as does the change to engraved designs. Mason (1976:119) states that the Rock Island, Michigan rings seem to support an earlier time period for heart-shaped bezels.

Regardless, the literature generally seems to date the rings to an earlier period than the occupation of Fort Gibraltar I. It would appear that there are three plausible explanations for the apparent discrepancy in dating the rings. First, the rings were durable trade items and they might have been carryovers in stock. Second, it was suggested that the rings recovered in 1990 represented part of an earlier Fur Trade occupation (Kroker *et al.* 1991:100). The recovery of 21K53N6-8403 in levels directly related to Fort Gibraltar I seems to negate this second alternative. Third, the manufacture of the rings, as a secular trade item for which there was an on-going demand, continued long after the dates ascribed by researchers who have concentrated on eastern American archaeological sites dating to the French Regime. Archival research on trade post inventories, histories of Montreal and other Canadian manufacturing firms that specialized in trade items, and personal journals of traders could contribute to the resolution of the question of the temporal period of these artifacts.

6.8.2.3 Tinkling Cones

Six brass tinkling cones were recovered during 1991 (Table 6) (Figure 38c). As would be expected, most of the cones (five of six, or 83%) were recovered from Fur Trade levels. 21K53S5-9840 was recovered from the Experimental Farm level and may have been displaced by flood waters or rodent activity.

INVENTORY NUMBER	WIDTH	LENGTH	COMPLETE
21K63D3-7938	6.1	21.3	yes
21K66B8-8239	4.7	12.1	no
21K53N7-9242	3.7	15.9	yes
21K57S7-9288	7.0	33.0	yes
21K53S5-9840	4.9	12.5	yes
21K58L3-10606	5.3	21.8	yes

Table 6: 1991 Tinkling Cone Data

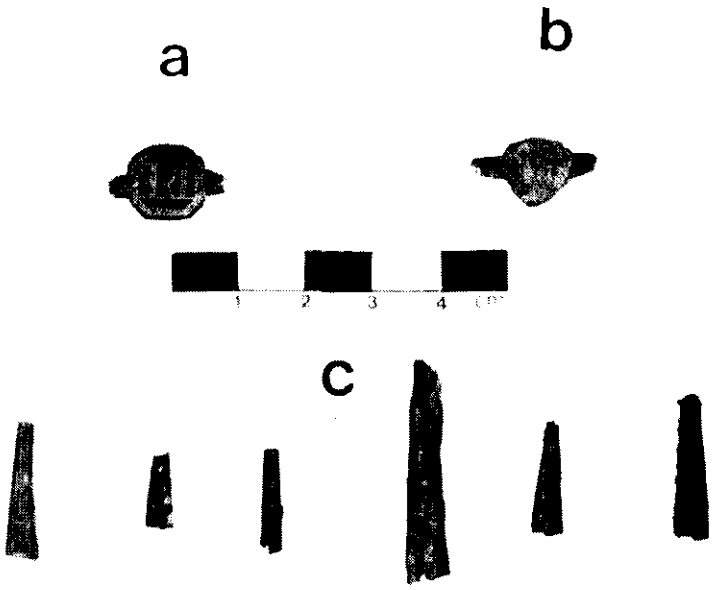


Figure 38: Finger Rings and Tinkling Cones

The cones range in width from 3.6 mm to 7.0 mm and in length from 12.1 mm to 33.0 mm. While cones from some sites seem to cluster by size—particularly by length—there appears to be little consistency between sites.

Tinkling cones—also called tinklers, banglers or jingling cones—are common items characteristic of the Fur Trade Period. They were used by Europeans and Natives as decorative items on clothing, wristbands, anklets, and bags (Quimby 1966:76).

The cones were manufactured from trapezoidal-shaped blanks of sheet metal, which were then rolled to form a truncated cone (Stone 1974:131). Brass, copper and iron were the most common materials used. In some cases, blanks were cut from sheet brass (cf. Stone 1974:131). The reuse or recycling of worn or damaged kettles has also been documented (Kidd 1970:170; Hamilton 1987:80-81). Both cases are likely. The cones from Fort Gibraltar I may have been worn by fort inhabitants and/or produced as secondary trade items.

6.8.3 Lighting

Two metal artifacts relating to lighting production were recovered during the 1991 season. Both derive from commercially manufactured lamps.

The first, 21K53S3-7758, is a brass lamp burner from a kerosene-burning, vertical wick lamp (Figure 39a). The thumb wheel and wick tube have remained intact despite the flattened condition of the burner. The burner is decorated with a linear series of quatrefoil holes. Kerosene vertical wick lamps were in widespread use by the 1860s (Woodhead *et al.* 1984:48). This period of use corresponds with the Pre-Railway/Post-Experimental Farm levels in which the artifact was found.

The second artifact, 21K54P1-8568, is a rectangular wick tube from a vertical wick lamp (Figure 39b). It is manufactured from sheet brass and measures 50.2 mm in length. The tube has rectangular punched holes. The width of the originally rectangular aperture (present width is 17.7 mm) may have fitted a Size 1 or Size A wick of $\frac{5}{8}$ inch (Woodhead *et al.* 1984:50). 21K54P1-8568 was recovered from Railway period levels (1888–1988), consistent with the post-1860 usage dates provided above.

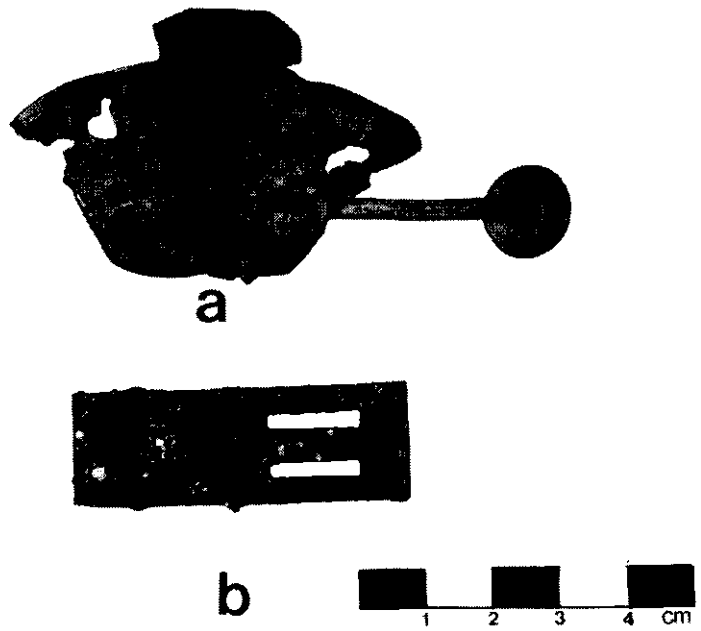


Figure 39: Lighting Artifacts

6.8.4 Miscellaneous Metal

The 155 artifacts discussed under this grouping range from identifiable artifacts, which do not fall into a more specific category, to those that are so fragmentary or so poorly preserved as to be unassignable to form or function. The recovered material is described by material type (i.e., ferrous, cuprous, pewter or lead) within each of the events.

6.8.4.1 Fur Trade Period

Ninety metal artifacts from Fur Trade levels have been assigned to this category. Forty-nine of these are ferrous (iron and steel), thirty-one are cuprous (copper, brass, bronze), three are pewter, and seven are lead. The artifacts will be discussed by material grouping. Unidentifiable artifacts are listed in Table 7 with appropriate measurements and descriptions. Measurements, particularly for ferrous materials, must be considered approximate due to corrosion or rust build-up.

6.8.4.1.1 Ferrous Artifacts

21K63B7-9135 is the tip of an iron knife blade (Figure 40a). The length of the fragment is 70.8 mm. The knife is 1.6 mm thick at the upper, blunt edge, narrowing to 0.7 mm at the cutting edge. The tip is slightly rounded, presumably from wear. The cutting edge tapers upwards to a straight back. The artifact is too incomplete to determine the style or date of manufacture. Knives of various types were common as trade items as well as being used by post inhabitants.

21K65B10-8438 may represent an incomplete metal projectile point with a *tang* (Figure 40b). The thickness is 0.9 mm. Projectile points were common trade goods, often made on site. The fragmentary nature of this piece precludes definitive identification.

Twenty fragments are roughly triangular in shape (Figure 40c). Found only in units 55V and 56V (21K55V7-11295, 21K56V9-11498, 21K56V8-11506, 21K56V7-11530) their distribution, frequency, size, and shape suggest a pattern. While many of the triangles are incomplete, the following measurements have been obtained: base width varying from 10.5 to 16.1 mm, length from 28.5 to 52.5 mm, and thickness at base from 1.7 to 3.4 mm. The intended use of these fragments is a mystery. They may represent a stage of manufacture rather than a finished product, i.e., preforms. Possible identifications include:

1. Preforms for projectile points. Often made locally of discarded metal and used long after guns were available (Kidd 1970:76), metal projectile points varied greatly in shape and size. These triangular specimens, however, are thicker than most, as well as having narrow bases in relation to their length.
2. Preforms for pendants and/or ear, nose ornaments. These fragments seem too thick and heavy for such a purpose.
3. Axe head wedges, intended to increase the width of the head of an axe handle (Noble 1973: 140). These examples may be too thin to be useful (Steer *et al.* 1979:116).
4. Waste material from an activity that used sheet metal or recycled flat iron to manufacture a product.

6.8.4.1.2 Cuprous Artifacts

21K66D7-8890 is a 1975 Canadian penny. Obviously this artifact is intrusive in a Fur Trade level and was most probably lost by a participant or thrown in the pit as a facetious donation.

21K56N8-11139 is an incomplete brass straight pin (Figure 40d) with a head diameter of 2.1 mm, a shank diameter of 1.0 mm, and a length of 17.5 mm. The pin appears to be made by a manufacturing technique which dates to pre-1824 (Steer *et al.* 1979:138–139). Pins are listed as trade items in an 1878 HBC inventory (Dempsey 1973:46) and would have been used by site inhabitants.

21K58G14-10636 is a rectangular, flattened rim fragment (103.0 x 28.9 mm) of a brass kettle or pot (Figure 40f). The rim consists of a double thickness of the brass, formed by folding a narrow strip towards the interior. The thickness of the body is 0.6 mm.

NUMBER	MATERIAL	MEASUREMENT	DESCRIPTION
21K63B6-7966	Ferrous	2.4 thick	sheet-metal fragment
21K66B8-8189	Ferrous	2.7 diameter	wire
21K57U8-8693	Cuprous	0.8 thick	2 sheet-metal fragments
21K57U8-8694	Cuprous	0.7 thick	sheet-metal fragment
21K65D7-8859	Cuprous	0.2 thick	sheet-metal fragment
21K57U8-8979	Ferrous	4.4 thick	sheet-metal fragment
21K57U8-9144	Cuprous	0.5 thick	sheet-metal strip
21K53N6-9165	Cuprous	0.3 thick	sheet-metal fragment
21K57S7-9196	Cuprous	0.6 thick	sheet-metal fragment
21K53N7-9241	Cuprous	1.2 diameter	wire
21K54N6-9260	Ferrous	13.6 x 8.4	conical; corroded
21K57S7-9284	Cuprous	0.5 thick	2 sheet-metal fragments
21K56W8-9408	Cuprous	0.8 thick	sheet-metal fragment
21K56W8-9409	Cuprous	3.1 diameter	flattened tube
21K63B7-9430	Ferrous	2.0 thick	sheet-metal fragment
21K64B9-9665	Ferrous	1.4 thick	sheet-metal fragment
21K57P1-9898	Ferrous	12 x 11 x 5.4	triangular; ridged
21K53S7-10065	Cuprous	1.7 diameter	wire
21K63F3-10503	Ferrous	2.1 diameter	wire
21K58K3-10619	Cuprous	0.7 thick	4 sheet-metal fragments
21K57R10-10810	Cuprous	0.4 thick	4 curved fragments
21K63C6-10927	Ferrous	2.4 thick	sheet-metal fragment
21K57R8-10961	Ferrous	2.8 thick	sheet-metal fragment
21K55V7-11008	Cuprous	1.0 thick	sheet-metal fragment
21K55T7-11213	Ferrous	11.3 x 3.5	square cross-section
21K55T7-11213	Ferrous	3.0 thick	2 sheet-metal fragments
21K55T7-11215	Lead		irregular fragment
21K55V7-11290	Cuprous	0.8 thick	sheet-metal fragment
21K55V7-11291	Cuprous	0.8 thick	sheet-metal fragment
21K55V7-11292	Cuprous	3.7 diameter	flattened tube
21K55V7-11293	Lead		irregular fragment
21K55V7-11294	Ferrous	3.0 thick	sheet-metal fragment
21K55V7-11294	Ferrous	3.4 thick	sheet-metal fragment
21K55V7-11294	Ferrous	3.2 thick	sheet-metal fragment
21K55W8-11396	Ferrous	3.2 thick	sheet-metal fragment
21K56V7-11521	Ferrous	18 x 4 x 3	tapered
21K56V7-11523	Cuprous	3.2 diameter	flattened tube
21K56V7-11523	Cuprous	0.6 thick	sheet-metal fragment
21K56V7-11523	Cuprous	0.3 thick	sheet-metal fragment
21K56V7-11529	Ferrous	3.0 thick	6 sheet-metal fragments
21K55W6-11599	Cuprous	2.4 diameter	flattened tube
21K55W6-11603	Lead		irregular fragment
21K55W6-11604	Ferrous	2.4 thick	3 sheet-metal fragments
21K55Q4-11837	Lead		2 irregular fragments

Table 7: Unidentifiable Fur Trade Metal Artifacts

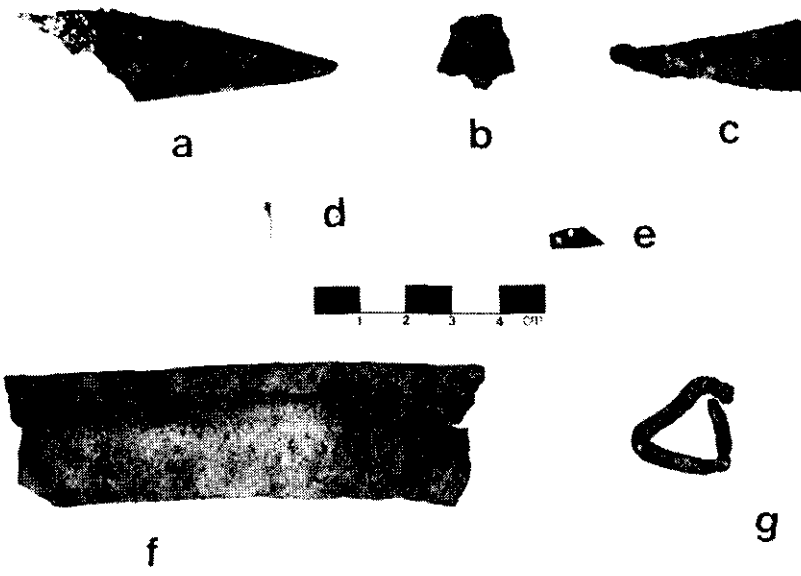


Figure 40: Fur Trade Metal Artifacts

Numerous fragments (Table 7) are scraps of sheet metal, often bearing cut marks. Thicknesses range from 0.4 to 1.3 mm with an average of 0.6 mm. While sheet brass fragments are scattered throughout the excavated units of the site, many are loosely clustered in the same area as the ferrous triangles previously mentioned, suggesting an activity area of metal working and reworking. Brass recycling is commonly documented at other posts. Hamilton (1987:80) states that "this brass sheet metal generally represents fragments of kettles and pots which . . .were worn out or otherwise damaged . . . These handmade items were likely used both by the occupants of the post as well as commodities of exchange with Natives." Tinkling cones, as well as the brass tubing (Table 7), may be items made on-site from previously-used brass. The numerous fragments recovered are likely pieces too small to be reused and therefore were discarded.

6.8.4.1.3 Pewter and Lead Artifacts

21K63R7-9755 is a small flat, trapezoidal pewter fragment (Figure 40e). The length of this cut artifact is 12.1 mm, the width is 4.7 mm, and the thickness is 0.4 mm. A punched hole (diameter 1.4 mm) is located on the shorter longitudinal side. 21K56V7-11522 and 21K57U8-8696 are small pewter fragments that are almost identical in colour and thickness to 21K63R7-9755.

21K57R7-9153 is a bent lead piece, roughly circular in cross-section, with a variable diameter of 3.75 mm (Figure 40g). This wire-like artifact may be lead stock. It is partially severed at one point.

21K57R9-9398 is a lead artifact roughly spherical in shape with striations on one side and a ridge on another side. This could be an improperly cast musket ball, a musket ball that impacted into an penetrable object, or waste product from the manufacture of lead shot. The five remaining lead fragments are amorphous in shape with two of them exhibiting cut marks. These are probable examples of excess material from the lead shot casting process.

Many of the metal artifacts, especially those that appear to be the residue of a reworking or manufacturing activity, are located in a cluster (Figure 41). This cluster includes lead artifacts as well as the ferrous and cuprous scrap.

6.8.4.2 1826 Flood

Only seven metal fragments from the 1826 Flood event fit into the Miscellaneous Metal category. Four are iron and three are brass. The ferrous artifacts are small sheet metal fragments, all less than 10 mm long. Thicknesses range from 0.7 to 1.9 mm.

21K53R6-8908 is a 14.4 mm section of brass wire with a diameter of 1.9 mm. Two flat scrap pieces of brass are 0.4 and 0.7 mm thick.

6.8.4.3 Experimental Farm Period

Eighteen artifacts from the Experimental Farm level have been classed as Miscellaneous Metal. Sixteen are ferrous, one is brass, and one is lead.

The ferrous artifacts exhibit considerable corrosion. 21K63B4-8486 is a triangular fragment similar to the specimens in the Fur Trade levels. It has possibly been displaced upward. 21K54P4-9043 is composed of two fragments corroded together—a curved semi-circle and a straight fragment, possibly a shank portion of a nail.

21K53Q5-8576 is 33.4 mm long and round in cross-section with a bulbous end. It appears to be a rust concretion on an unidentifiable object. 21K63B4-8479 is a small fragment of sheet metal (1.6 mm thick) and 21K53W3-9667 consists of twelve exfoliated fragments of thicker (4.8 mm) sheet iron.

The brass fragment (21K63B4-7767) is rectangular and folded approximately in half. It is 12.75 mm wide. One edge shows millwork or a decorative knurling (Figure 42a). The other edge has been cut. The artifact is probably a reworked fragment of a decorative item, such as a picture frame.

21K56Q5-11668 is a rough, dome-shaped lead piece, 2.3 mm thick. This may be excess from casting or a poorly cast ball. It, too, may have been disturbed from lower levels.

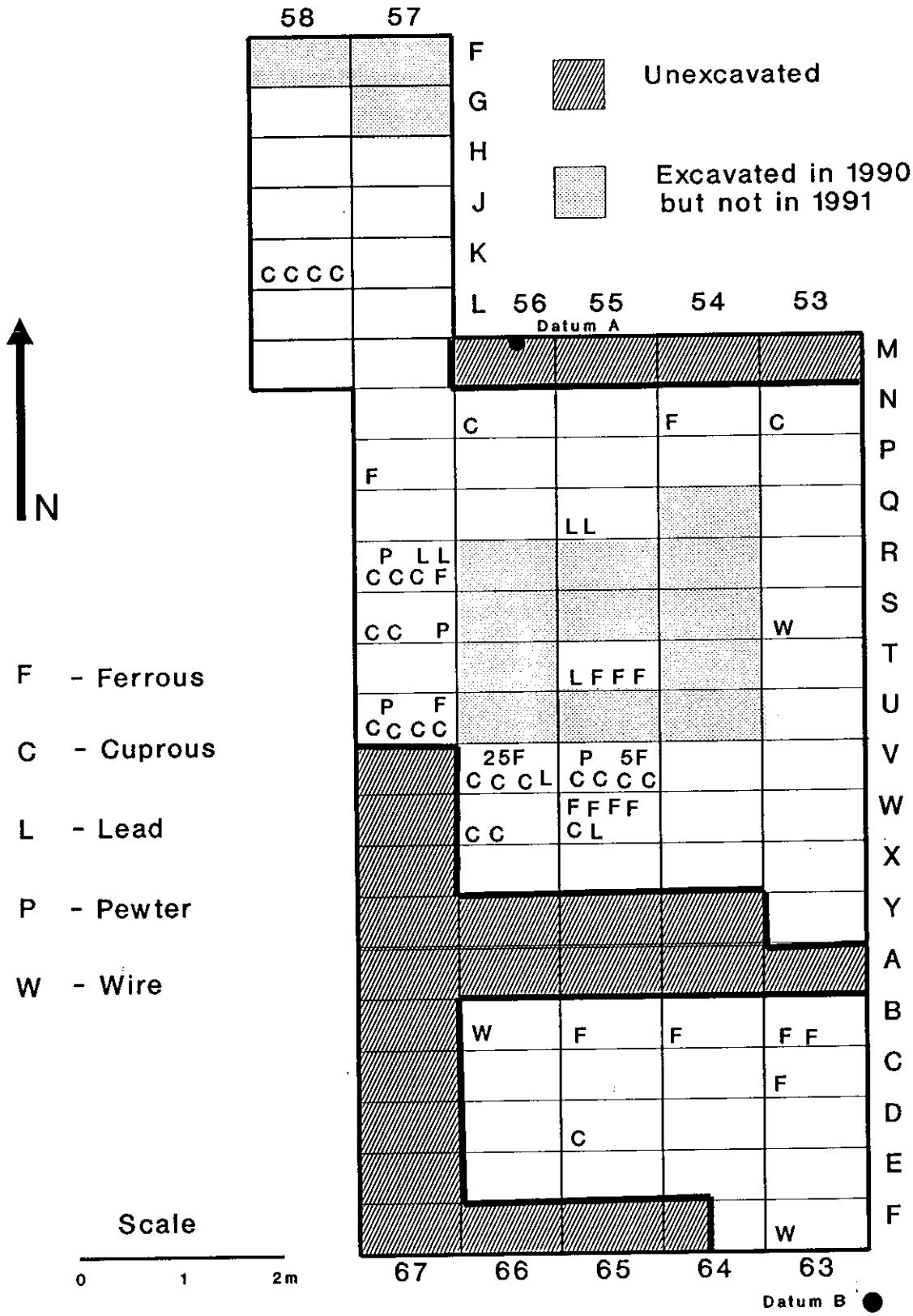


Figure 41: Location of Fur Trade Metal Artifacts

6.8.4.4 Pre-Railway/Post Experimental Farm and Pre-Railway/Post-Flood Periods

Twenty-five metal artifacts from the Pre-Railway/Post-Experimental Farm levels and one artifact from Pre-Railway/Post-Flood levels can be assigned to the Miscellaneous Metal category (Figure 42). Twenty-one are ferrous, four are cuprous, and one artifact combines both.

A flat ferrous fragment (21K57Q1-9518) from the Pre-Railway/Post-Flood period may be the tang from a knife (Figure 42b). Two holes aligned along the centre of the artifact measure 3.2 and 12.9 mm. The artifact is 1.5 mm thick and measures 44.5 mm along the longer edge.

21K53Q3-8093 (Figure 43) consists of two long (435 mm) curved blades, which were found in association. The blades are scimitar-like with a cutting edge that tapers toward the end. However, they have the reverse curvature of a scythe, with a convex edge measuring 32 mm wide at the proximal end. The blades have been formed by wrapping sheet iron over a curved iron rod (5.4 mm in diameter). The sheet iron does not appear to have been welded, relying on the tightness of the wrap to keep it in place. The iron rod of the more complete specimen bends at ninety degrees at the proximal end, producing a straight protrusion 27 mm long. The artifacts are badly corroded and one is twisted near the terminal end. An agricultural origin for these artifacts is hypothesized, although the reverse curvature precludes the possibility of a hand-held cutting implement such as a scythe or sickle. They may be tines from some type of hay cradle or a portion of farm machinery.

21K55W3-7691 is a rectangular, cast iron fragment (Figure 42c) that measures 31.3 mm long. One face is flat and the other has a bevel, producing a dull cutting edge. The artifact is suggestive of a portion of a scissor blade. 21K54N2-9494 is a ferrous ring (Figure 42d), similar in shape to the bow of a skeleton key (Ashdown 1909:288–293). A pipe fragment, 21K55W3-7696, is oval in cross-section due to crushing. Its dimensions are 25.3 mm long, 29.4 mm wide, 13.9 mm thick, with a wall thickness of 3.0 mm.

The functions of most of the remaining ferrous artifacts are unknown. A small cast iron artifact, 21K53Q3-8318, is rectangular in cross-section with a slight curvature. Its dimensions are: length 21.3 mm, width 3.7 mm and thickness 3.2 mm. 21K54W2-10053 is composed of two iron straps, averaging 16.3 mm in width and 0.9 mm thick. These may be the remains of barrel hoops. 21K54N2-9493 is a small friable coiled section of a thin iron strip. 21K55Q2-8310 is a triangular section of thin sheet metal. The remaining specimens consist of nine fragments of corroded sheet metal and one cylindrical rust concretion.

21K54N2-8962 consists of two iron straps joined by brass rivets (Figure 42e). Thickness of the individual bands is 1.4 mm. The artifact is 18.9 mm wide by 52.4 mm.

21K57S1-7663 is a heavy, cylindrical cast bronze machinery fitting, 46 mm in diameter. The cap-like artifact has an internal thread and a small central threaded bore hole (6.0 mm) at the top. A small repository cavity occurs at the internal top, adjacent to the vertical wall. This artifact is probably a grease cap from a large machine and would have had a grease nipple screwed into the bore hole. The specimen is in good condition, although coated with a green patina. 21K53R3-7896 is a small tine-like brass fragment, 16 mm in length, and of unknown purpose. 21K53W2-9656 appears to be a cast copper pipe fragment, 17 mm in length with an approximate diameter of 7.6 mm. The wall thickness is 2 mm. 21K56V3-11736, a sheet metal fragment, is 22.4 mm long, 0.9 mm thick, and 3.7 mm wide. The artifact is variable in shape and has a punched hole adjacent to one longitudinal edge.

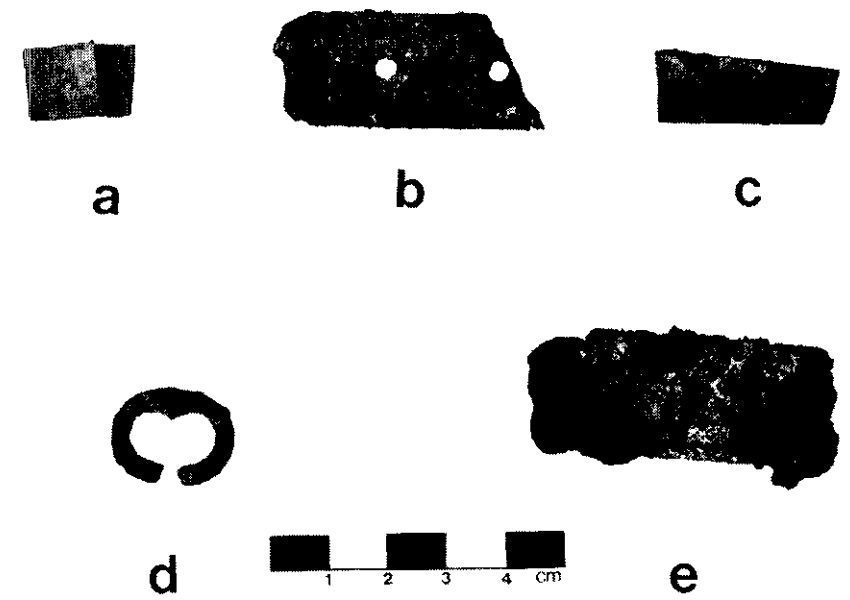


Figure 42: Experimental Farm and Pre-Railway/Post-Experimental Farm Artifacts

Figure 43: Curved Blades

6.8.4.5 B&B Construction

Two metal artifacts were recovered from the B&B Construction event, both from 21K56P2. The first (21K56P2-8157) is a ferrous wire fragment, 1.5 mm in diameter, 9.7 mm long. The second artifact, of cast brass, is curved and tooth-like with a rectangular cross-section. It measures 26.3 mm long, 2.7 mm thick and 6.3 mm wide at the base. This may be a portion of a tine from an unknown implement.

6.8.4.6 Railway Period

Ten Railway Period artifacts were found during the 1991 season. Eight (21K54P1-8569) were fragments of ferrous scrap, either sheet metal or strapping.

21K54P1-8566 is a round artifact, approximately 67.0 mm in diameter. With a concave interior and convex exterior, it is comprised of two parts: a domed iron body and a central brass ring enclosing a hole filled with dirt/cement/corrosion. The artifact resembles the outer half of a door bell (Ashdown 1909:302–303) or a circular escutcheon for an interior doorknob (Ashdown 1909:219, 360).

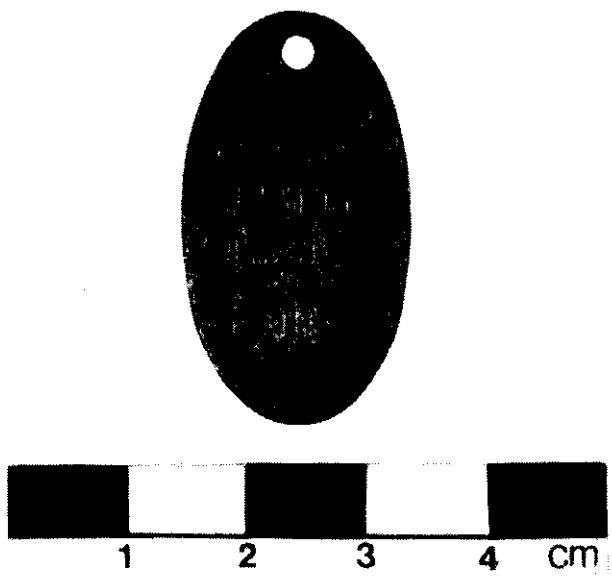


Figure 44: Railway Period Metal Tag

21K53W1-8672 is a flat, oval tag of cast brass (Figure 44). Maximum length is 34 mm, maximum width is 19 mm. The stamped letters are:

C.L.P.
WINNIPEG
1897
1018

The first and last lines are stamped more deeply than the middle lines. A hole has been punched at the top. The tag is bent near the top, possibly in an effort to twist it from the connecting attachment. Research has failed to uncover the meaning of the inscription. It may be related to the railway (e.g., freight/ baggage).

6.8.4.7 Disturbed Context

Two ferrous artifacts were excavated from disturbed contexts. 21K57N4-9806 is a bent fragment of sheet iron, 0.7 mm thick and 32.6 mm wide. 21K57N1-9863 is a small fragment of sheet iron wrapped around a rod. It is identified as a part of the previously described curved blades, 21K53Q3-8093.

6.9 Nails

A total of 277 ferrous (iron and steel) nails were recovered during the 1991 excavations.There are sixty complete specimens; the remainder are broken, making length measurements inapplicable. As all of the nails exhibit varying amounts of corrosion, type can be difficult to determine.

Three temporally distinct nail manufacturing methods were used in North America.The earliest method is known as *hand-wrought*. Nails of this type were produced from the 15th century into the 19th century (Nelson 1968:6; Noble 1973:127). Six hand-wrought nails were recovered during the 1991 field season (Table 8).

The second nail manufacturing method is *sheet-cut*. These nails were first produced in the United States, in 1790. Shortly after this time, sheet-cut nail manufacturing began in Canada, initially at Montreal (Noble 1973:127). From 1790 to 1825, nail heads were generally formed by hand-hammering. After 1825, the nail heads were stamped by machine (Noble 1973:127).

It has previously been noted (Kroker *et al.* 1991:105) that sheet-cut nails were used in the Red River Settlement after 1860, when quantities of American goods could be transported by steamboat. However with the manufacture of sheet-cut nails in Montreal ca 1800, they could have been transported to the west prior to 1860.The majority of recovered nails are sheet-cut.

The third method of nail manufacture is *wire-cut* (also called *drawn*). This technique involves extruding a piece of wire and cutting it into desired lengths. The head is then added separately (Figure 45). Production of wire-cut nails began in the 1850s in the United States, and was perfected in the 1870s. Nelson notes that due to their greater holding power "many builders preferred using cut nails well into the twentieth century" (1968:10). Thirty-five wire-cut nails were recovered.

	Railway	B&B Construct	Pre-Railway/ Post-Flood	Pre-Railway/ Post-Farm	Experiment Farm	1826 Flood	Fur Trade	Disturbed Context	TOTAL
Wrought	1						5		6
Sheet-cut	3	22	2	167	13	5	10	14	236
Wire-cut	3	5		20	1	3		2	34
Undetermined							1		1
TOTAL	7	27	2	187	14	8	16	16	277

Table 8: Distribution of Nails By Manufacturing Technique

One nail is so badly corroded that the manufacturing technique cannot be determined.It was located in an upper Fur Trade level (Layer 14) indicating that it was probably hand-wrought.

The majority of the nails (187 or 67.5%) were recovered from the Pre-Railway/Post-Experimental Farm Period (1848–1888). A further 27 (10%) came from the B&B Construction Period (1888–1889).The remainder were distributed throughout the events (Table 8).

6.9.1 Hand-Wrought Nails

Hand-wrought nails are characterized by shanks that taper on all sides toward the point. As each nail is individually made by hammering, the taper from head to point tends to be slightly irregular resulting in variable thicknesses along the length (Noble 1973:125).

One complete nail, 21K53S2-7887, was recovered from the base of the railway fill (Figure 46a). It has a large, flat, irregularly-shaped head (16 mm by 13 mm), tapers to a point and is 85 mm long.

The remaining five hand-wrought nails, including two shank fragments, were recovered from Fur Trade levels. One complete nail (21K58K3-10627) is 54 mm long and has a flat square head (Figure 46b). Two incomplete nails (21K58M3-10612 and 21K58M3-10613) have large, flat, irregularly-shaped heads (16 mm by 13 mm). These three specimens are from Feature Q. The presence of four of the six hand-wrought nails in Feature Q, in association with wood structural remains, suggests that the nails were used during the Fort Gibraltar I construction.

6.9.2 Sheet-Cut Nails

Sheet-cut nails are distinguished by shanks that taper on two opposing sides. The thickness of the shank from head to point is constant as the nail is cut from a uniform sheet of iron. Many types, such as L-head (Figure 46c), T-head (Figure 46d), and brad (Figure 46e), were used as finishing nails, where it was not desirable to have the head showing. These uses include flooring and trim-work.

Table 9 shows the distribution of sheet-cut nails according to head type. The majority (167) of the 236 sheet-cut nails are from the Pre-Railway/Post-Experimental Farm Period. This could be related to the presence of the immigration sheds and the shanty town, which were in the area from 1872 to 1885. A further 22 nails were found in the B&B Construction levels, while 13 were excavated from the Experimental Farm layer, and 10 were located in Fur Trade levels.

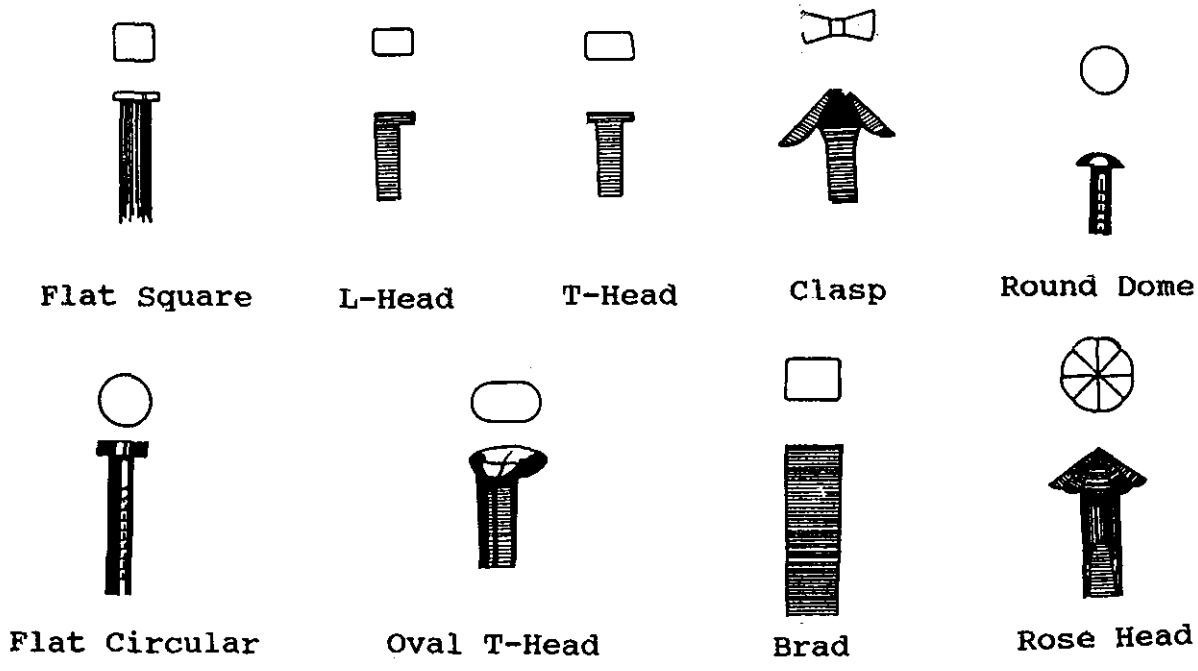


Figure 45: Nail Head Types (from Parks Canada 1982)

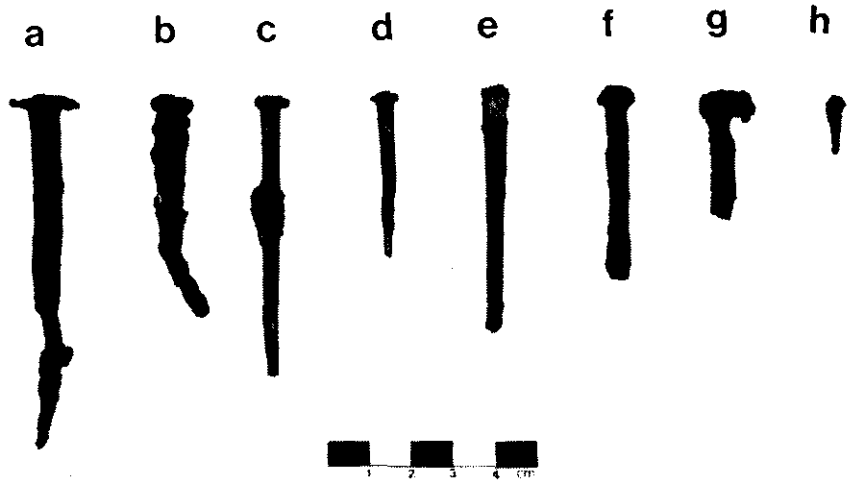


Figure 46: Recovered Nails

Fifty-four common nails have flat square heads (Table 9). Seventeen of these are complete and range in length from 25 mm to 154 mm. Twelve additional common nails have flat circular heads. Six of these are complete and range in length from 22 mm to 94 mm. Two of the specimens with flat circular heads, 21K58L3-10597 and 21K58L3-10598, measure 26 mm and 22 mm, respectively. They are from Feature Q and are probably tacks.

Finishing nails with flat, square heads number 33 (Table 9). Twelve are complete, ranging from 25 mm to 46 mm in length. Twenty-six were recovered from Pre-Railway/Post-Experimental Farm levels.Other finishing nails include L-head (9), T-head (19), and brad (7). Six of the seven complete nails are 40 mm to 75 mm long, while a small T-head nail is 22 mm in length.

Two types of clasp head nails were recovered. 21K56W3-8585 is the standard V-shaped clasp head (Figure 46f). 21K53T2-7869 has a very irregular head resembling a cross between a pronounced T-head and a clasp head (Figure 46g).

A single specimen, 21K54W2-8169, has a rounded, circular (dome-shaped) head (Figure 46h). It is complete, measuring 14 mm long, and is identified as a tack.

Due to missing heads, 86 of the 236 sheet-cut nails could not be assigned to a type. An additional 11 are so badly corroded that the head type could not be identified.

	Common Flat Sq.	Flat Circ.	Headless	Finish Flat Sq.	L-Head	T-Head	Brad	Clasp	Round Head	Unident.	TOTAL
Railway		1	1							1	3
B&B	4	1	8	3	1	2	3				22
Pre-Railway/ Post-Flood	1		1								2
Pre-Railway/ Post-Farm	42	6	59	26	8	15	3	2	1	5	167
Experiment Farm	1	1	7	1		1	1			1	13
1826 Flood		1	2	1						1	5
Fur Trade	2	4	2							2	10
Disturbed Context	4		6	2		1				1	14
TOTAL	54	14	86	33	9	19	7	2	1	11	236

Table 9: Distribution of Sheet-Cut Nails By Head Type

6.9.3 Wire-Cut (Drawn) Nails

Wire-cut nails commonly have round shanks, in contrast to the rectangular shanks of sheet-cut and hand-wrought nails. Twenty of the 34 drawn nails recovered during the 1991 excavation were from the Pre-Railway/Post-Experimental Farm horizon (Table 10). An additional eight nails came from the Railway and B&B Construction levels.

Common type nails with flat circular heads number 18. There are 11 complete specimens, which range in length from 38 mm to 100 mm. Sixteen nails are headless and cannot be assigned to a type.

	Flat Circular Common	Headless	TOTAL
Railway	3		3
B&B Construction	4	1	5
Pre-Railway/Post-Farm	8	12	20
Experimental Farm	1		1
1826 Flood	1	2	3
Fur Trade			
Disturbed Context	1	1	2
TOTAL	18	16	34

Table 10: Distribution of Drawn Nails By Head Type

6.10 Smoking Pipes

Twenty-six pipe fragments were recovered during the 1991 season (Table 11). The majority (23) were cast of white ball clay, which is commonly termed *kaolin*. The remaining three fragments were made of grey siltstone.

6.10.1 Clay Smoking Pipes

Six fragments were from the bowl portion of pipes. Ten were stem pieces, one of which was identified as a mouthpiece. One artifact included portions of spur, stem, and bowl. The six kaolin fragments from the 1826 Flood level are tiny spalls, not identifiable to pipe portion, and were likely Fur Trade level artifacts redistributed by the 1826 flood waters.

The practice of marking a pipe by including makers' names and locations became common about 1800 (Walker 1983:3). Two of the 1991 pipe fragments are embossed with identifying marks.

A stem fragment, 21K63E1-7789 (Figure 47a), was recovered from the Pre-Railway/ Post-Experimental Farm level (1848 to 1888). The bore is slightly off-centre and the mold seams are smooth and somewhat flattened. It has an "M" on one side of the stem and an "N" on the opposite side. A portion of the outline, which would have surrounded the entire molded inscription, is also visible. Given the locations of the letters, as well as their style, it is likely that they represent the words BANNERMAN/MONTREAL. Until the second half of the 19th

	Lithic Bowl	Kaolin Bowl	Plain Stem	Marked Stem	Marked Spur	Spall	TOTAL
Pre-Railway/ Post-Farm			2	1			3
Experimental Farm			3				3
1826 Flood		1				6	7
Fur Trade	3	4	4		1		12
Disturbed Context		1					1
TOTAL	3	6	9	1	1	6	26

Table 11: Distribution of Smoking Pipe Fragments By Event

century, pipes were imported from Europe. By 1850, clay pipes were manufactured in Canada, with Montreal in particular supporting a substantial industry. Canadian pipes were half the price of imports during this period. While unmanufactured pipe clay entered Canada tax free, imported pipes were taxed at 12.5 per cent (Smith 1986:58). The Bannerman firm, which also produced rope and tobacco, manufactured pipes that have been recovered from Canadian sites from New Brunswick to Alberta (Walker 1983:24). Pipes of this type date from 1870 to 1903 (Smith 1986:57).

Figure 47: Clay Pipes

The second mark-bearing pipe, 21K57R7-7937 (Figure 47b), was recovered from Fur Trade levels (pre-1826). This example is represented by stem, spur, and several refitted bowl fragments. The bore is well-centred, with mold seams that are smooth on the stem and rough on the bowl. The bowl is heavily blackened by tar/nicotine staining, which is considered indicative of at least 2 or 3 weeks continuous use (Smith 1986:60).The mark is located on the spur, with a "T" on one side and a "D" on the other side.

The "TD" type appears to have been first manufactured in London, England ca 1755, probably by Thomas Dormer, and was apparently so successful that it soon became widely plagiarized. While Glasgow makers appear to have specialized in this type, it was also manufactured by English, French, German, and Quebec companies, including Bannerman's of Montreal (Walker 1983:25,37). Therefore, although "TD" pipes were the most popular pipes of the 19th century, they provide little information regarding dates, companies, or manufacturing locations.

6.10.2 Lithic Smoking Pipes

Three lithic pipe fragments were recovered from Feature W, a thick deposit of ash associated with Fort Gibraltar I. The three fragments were reconstructed to form approximately three quarters of a pipe bowl. Commonly called Micmac or Algonquian Constricted Neck, the original pipe would have consisted of a bowl contracting towards the mouth and attached to the base by a narrow neck. The base is usually small, extending little beyond the diameter of the bowl. Common base shapes include cylindrical, round, square, and keel-shaped. A wooden stem would have been attached to the base, which often included perforations for additional attachment to the stem (West 1905:92–93). For Native peoples, pipes and smoking were imbued with ceremonial and spiritual significance. While Brown (1989:317) notes that the Micmac style pipes were unrelated to *calumet* ceremonialism, fur trade journals note the importance of smoking and pipes in trading behaviour.

The 1991 pipe bowl (21K63F3-8947), carved of grey siltstone, is particularly interesting in that it bears incised decoration (Figures 48 and 49). Inverted triangles around the rim and triangles around the bowl base are filled with diagonal lines. Ochre may have been used to decorate this pipe, as red colouration is faintly visible within some of the incised lines. The maximum bowl diameter measurement is 24.6 mm, with an approximate bowl height of 18 mm.

It has frequently been assumed that all lithic pipe remains from historical sites were Native-made artifacts. However, the recovery of pipes in various stages of completion from fur trade sites, including Pine Fort (Hamilton 1986:30) and Fort Epinette/Fort St. John I (Fladmark 1980), suggests that lithic pipe manufacture was occurring within the forts, presumably as intended trade items. In the English River Account Book of 1786, Pierre Marcille is recorded as having purchased a "calumet" from the North West Company at Île à La Crosse—for the price of 6 livres (Duckworth 1990:31). While it is uncertain as to what is meant by the term "calumet" in this instance, it generally refers to Native ceremonial stone pipes. These pipes may have been manufactured for use by Europeans as well as being trade items. Syms (1991:pers.comm.) has noted that Micmac pipes are more commonly found in French forts and the style may have been initially introduced by the French, only later being adopted as an item of Native manufacture. It is also noted in the English River Journal that *bourgeois* Peter Pond created stems (Duckworth 1990:11).

Figure 48: Siltstone Pipe

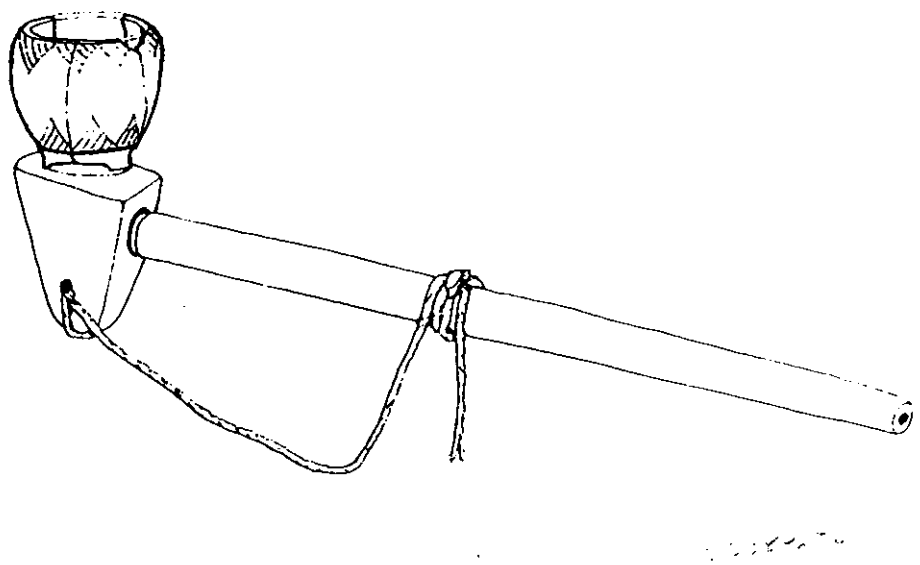


Figure 49: Artist's Rendering of Siltstone Pipe by Angela Luverà

While comparative data from other sites reveal that decoration is often present, decoration of the complexity exhibited on 21K63F3-8947 is relatively rare. It is difficult to determine the diagnostic importance of decorative elements on Micmac pipe bowls. Three similar bowls have been recovered from other Post-Contact sites. A bowl of grey siltstone from Fort St. Charles bears almost identical decorations and is similar in size and shape. Fort St. Charles was founded by La Verendrye on the Northwest Angle of Lake of the Woods and dates from 1732 to the 1750s (Birk 1981). A limestone bowl of approximately the same shape, with similar incised decorations, was recovered from a Native settlement on Rock Island, in Lake Michigan (Mason 1986:Plate 14.5). The Rock Island dates are ca 1700 to 1770. A third bowl with incised triangles was recovered from the Fletcher Bay site, a Native cemetery on Lake Michigan, dating ca 1740 to 1765 (Mainfort 1979:366). These three sites are associated with the French occupation of North America.

A limestone Micmac bowl, 21K64E5-4550, was recovered during the 1990 season at Fort Gibraltar I, also within the ash deposit. This specimen is larger than the artifact recovered in 1991 and has a plain exterior surface (Kroker *et al.* 1991:115-116).

6.11 Miscellaneous Organic

This class includes organic artifacts which do not fall into *Beads, Containers, Fasteners, Smoking Pipes,* or *Fauna.* For example, a shell bead and a wooden smoking pipe may be made from organic materials, but are more correctly classified under Beads and Smoking Pipes respectively.

6.11.1 Charcoal, Wood and Bark

A number of bark fragments were recovered from 1826 Flood and Experimental Farm levels.These have not been identified to species.

The overwhelming majority of artifacts in this class are fragments of wood, much of it burnt. Wood and charcoal fragments are scattered throughout the site. Figure 50 illustrates the distribution of wood by weight and excavation unit. It must be noted that the cataloguing system does not record the weight of samples of less than or equal to 0.5 grams. Thus, the total weights for each unit is slightly less than the actual recoveries. The bulk of the wood was found primarily in areas where Fur Trade structures have been excavated—Features Q and R. Other small concentrations may indicate Railway and Experimental Farm Period usage.

Eleven charcoal samples, collected from two structural features (Features R and Q), were submitted for wood identification. Samples that contained multiple charcoal remains were sub-sampled prior to identification by randomly choosing fragments. A charcoal specimen can be broken along three planes, which reveal a different view of the original wood cellular structure. It is necessary to break the specimen in order to expose a clean face, which is then mounted in plasticine on a microscope slide. A Wild Heerbrugg binocular microscope with magnifications between 12 and 100x (using 20x occulars) was used for identification. Identifications were verified by comparison with a reference collection.

A total of 35 fragments were identified (Table 12). All of the fragments represented hardwood species: *Populus* (poplar), *Ulmus* (elm), *Tilia* (basswood) and *Quercus* (oak). *Populus* occurred in eight of the eleven samples. *Tilia* occurred in two samples, and *Quercus and Ulmus* occurred in one sample each. Four of the samples contained partly charred wood.

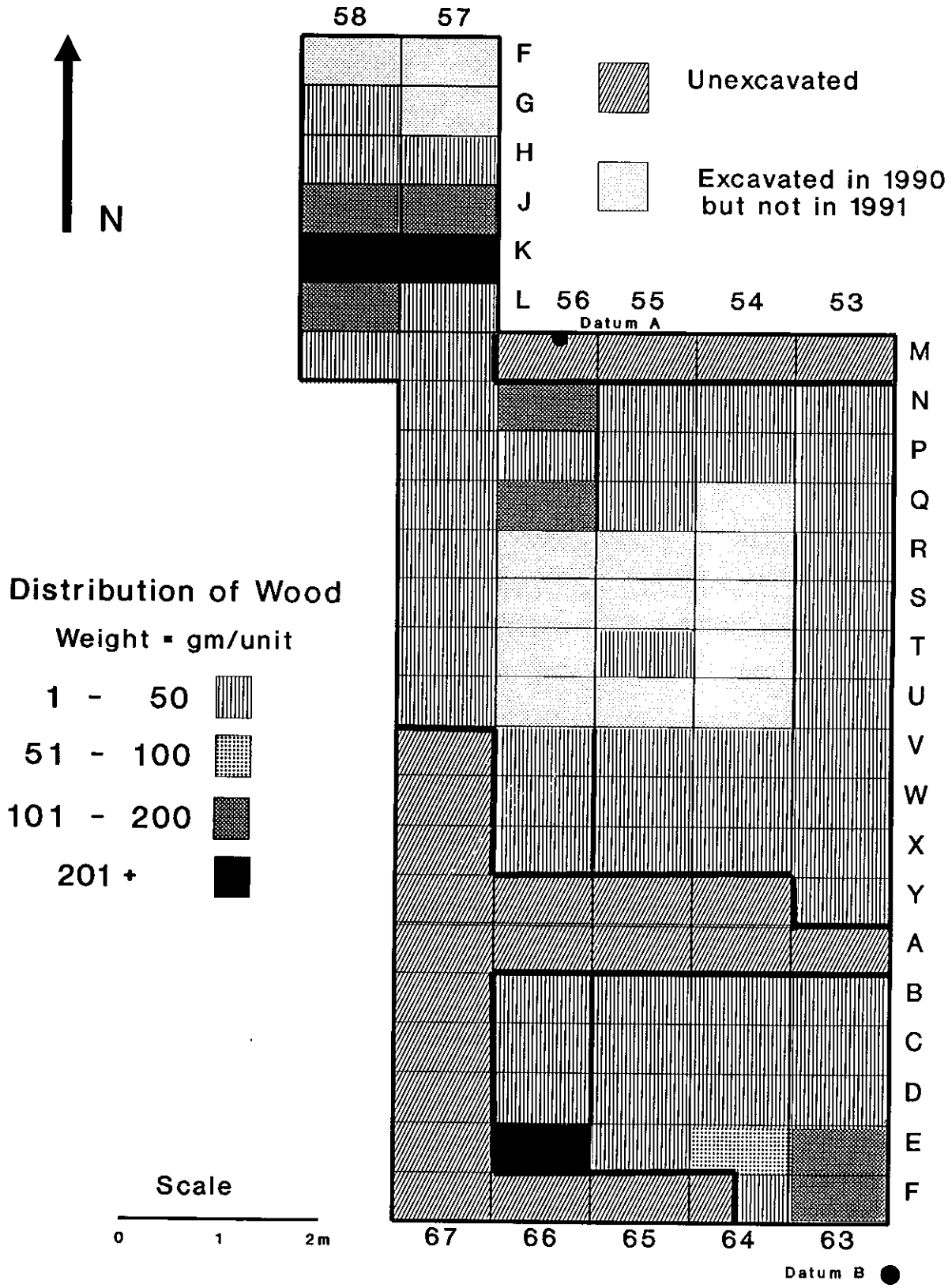


Figure 50: Distribution of Wood

CATALOGUE NUMBER	QUANTITY	DESCRIPTION	GENUS
21K57K12-9581	1	timber: 30x5x3.5 cm	Populus
21K57K12-9582	1	timber: 25x5.5x3 cm	Populus
21K57J13-9583	1	timber: 36x6x2.5 cm	Populus
21K58K4-10113	3	charcoal fragments	Populus
21K58K4-10113	3	charcoal fragments	Quercus
21K58K4-10114	4	charcoal fragments	Tilia
21K58L5-10115	4	charcoal fragments	Tilia
21K58J4-10116	1	piece: 14x8.5x3 cm	Populus
21K66E8-10118	5	charcoal fragments	*Ulmus*
21K66E8-10119	5	charcoal fragments	Populus
21K66E8-10120	5	charcoal fragments	Populus

Table 12: Identified Charcoal Samples

The three samples from units 21K57K12 and 21K57J13 consisted of incomplete poplar timbers that ranged in diameter from 2.5 to 3.5 cm. The remaining charcoal from Feature Q consisted of two samples of basswood, one sample of poplar and one sample with both oak and poplar. Feature R charcoal consisted of two samples of poplar and one sample of elm.

6.11.2 Seeds

Fifty-nine seeds and seed fragments were recovered. Two concentrations of uncharred seeds were collected as palaeo-botanical samples (21K58K5-9020 and 21K55W5-10117). Table 13 lists the individual seeds by event and type—the samples are discussed separately. Approximately 46% of the seeds originated from Fur Trade levels and 29% from 1826 Flood deposits. Only the Railway event did not yield any seeds.

The range of seed types appears to increase with depth and age of the deposits. This may be indicative of the more natural environment present during the earlier periods. Many of the seed remains are from edible species. The sunflower (*Helianthus*) seeds are likely intrusive. The *Prunus* seeds are generally pin cherries (*P. pennsylvanica*) except for the one *P. americana*, which is a species of wild plum. While the pin cherries may be natural inclusions within the site, they are edible as are wild plums. Hawthorn (*Crataegus*) may be a natural inclusion, but the fruits are edible and the roots were used as a medicine by the Chippewa (Densmore 1974:289). In addition, the plants were used around farms as hedges. Hazel (*Corylus*) nut fragments may indicate a subsistence resource. Morning glory or hedge bindweed (*Convolvulus sepium*) is a temporate circumpolar plant (Scoggan 1957:351) and the seeds may represent native specimens or plants that were introduced along with grain from Europe. Grasses (Gramineae) grow wild in the area.

The charring of the seeds is random. Both edible and inedible types are burnt. The plum pit and the hazel nut shell may have been charred by being discarded into a fireplace after the edible portion had been eaten.

The palaeobotanical samples were weighed, screened and sub-sampled. Each fraction was weighed to permit quantification of the number of seeds in the total sample. The seeds within each sub-sample were counted to permit quantification of the entire sample, with broken seeds considered as 0.5. The seeds were examined with a binocular microscope and identified using a standard reference (Montgomery 1977). The University of Manitoba reference collection was also utilized.

Sample 21K58K5-9020 was collected from the Feature Q area. It consists almost totally of well-preserved seeds with very little soil. Uncharred seeds of goosefoot (*Chenopodium* spp.) make up the preponderance of the sample, accounting for all but one of the identified specimens in the sub-sample (4798 out of 4882.5). One seed is identified as smartweed (*Polygonum* cf. *lapathifolium*). The remaining fragments are extremely small, having some characteristics similar to goosefoot. Based upon the sub-sample values, the entire sample would contain 90,000 seeds or 45,000+ per litre—an extremely high value. Such a frequency would be unusual for a natural deposit.

Goosefoot is a weedy annual which favours disturbed soil. The various species have different requirements, ranging from moist to dry habitats and from open to shaded areas. All members of the genus are prolific seed producers, with a single plant producing 75,000 seeds (Bassett and Crompton 1978:370). Smartweed is an annual plant which tends to grow in damp habitats and disturbed areas (Looman and Best 1979:318).

The edible seeds from goosefoot are starchy and can be ground to produce flour. The seeds were used as a food by Native groups (Erichsen-Brown 1979:413–416), while the leaves can be eaten as raw greens or potherbs (Williams 1977:20-21). Native groups utilized flowers and leaves of closely related species of smartweed to make decoctions for treating digestive ailments (Densmore 1974:344).

	Helianthus sp.	*Corylus* sp.	*Prunus pennsylvanica*	*Prunus americana*	*Crataegus* sp.	*Convolvulus sepium*	Gramineae	Unidentified	TOTAL
Railway									
B&B Construction	1		1				1	2	5
Pre-Railway/ Post-Farm	1		1		2			1	5
Experimental Farm			1		3				4
1826 Flood			12	1		2		2	17
Fur Trade		1	14		2	5	1	4	27
Disturbed Context								1	1
TOTAL	2	1	29	1	7	7	2	10	59

Table 13: Distribution of Identified Seeds

Given the location of the sample, it is possible that it derives from a natural deposit of seeds from plants growing on disturbed ground. However, the density of the sample suggests that the seeds have been concentrated—the question being whether by humans or by ground squirrels who cache quantities of seeds (Banfield 1974:115). As the sample was collected from beneath the remnants of the structure of Feature Q, it is most likely that it originated as a rodent food cache.

The second palaeobotanical sample, 21K55W5-10117, was described as a faecal sample in the field notes. The texture of the soil in the sample is consistent with such a description. The majority of the identified seeds from the sub-sample derive from food plants from which the seeds would have been ingested. Uncharred seeds of raspberry (*Rubus* cf. *idaeus*) make up the preponderance of the sub-sample, accounting for 93.6% of the identified specimens (2110 out of 2255.5). Goosefoot seeds were identified and account for 3.6% (81 seeds). Seeds from stinging nettle (*Urtica dioica*) account for 1.8% (41.5 seeds). One broken seed is identified as cinquefoil (*Potentilla* spp.) and the remaining two specimens are unidentified. Based upon the sub-sample values, the entire sample would contain 27,285.5 seeds, giving a density of 59,763 seeds/litre.

Various species of raspberry could have occurred in the gallery forest along the Red and Assiniboine rivers, as the genus tends to grow in wooded habitats, while nettle prefers moist, shaded areas (Looman and Best 1979:305). The mixture of fruit seeds with seeds from an edible herbaceous plant (Williams 1977:28) suggests that the specimen is a coprolite from an omnivorous species. The two most likely species are bear and human. The sample was located at the interface of the 1826 Flood sand deposits and the underlying clay (Layer 14). The temporal period for the deposition would be between 1817 and 1826, a time at which bear could still be expected to be extant in the area, at least on an occasional basis.

6.11.3 Other Organic Artifacts

Three possible wicker fragments (21K63B6-7970) were recovered from Fur Trade levels. A fragment of twisted fibres (21K56N3-11202), either string or rope, was excavated from Pre-Railway/Post-Experimental Farm levels.

Five pieces of leather were uncovered during the 1991 field season. Two of these are small scraps from Pre-Railway/Post-Experimental Farm levels. One fragment (21K53S1-8295) from the Railway event has a hole, which originally may have held a grommet/eyelet. Two leather fragments (21K53W2-9655) coated with silver paint appear to be harness of some type. They were recovered from a Pre-Railway/ Post-Experimental Farm level in unit 53W.

One tiny fragment of paper was recovered from the Fur Trade event. It has been stained slightly green, possibly from proximity to a cuprous metal artifact.

Two fragments of rubber were recovered—one from Fur Trade levels and one from the Pre-Railway/Post-Flood period. One other rubber artifact, a button fragment, has been discussed in Section 6.3.

6.12 Miscellaneous Inorganic

The majority of artifacts within this class are chinking fragments. Three other artifacts have been catalogued as Miscellaneous Inorganic. One of these, a clay button filler, has been discussed in Section 6.3.

A fossilized Crinoid stem segment, 21K53N7-9261, was recovered from Fur Trade levels. As noted in the 1990 report (Kroker *et al.* 1991:144), Crinoids are primitive, marine organisms whose fossilized remains are common in limestone deposits of Palaeozoic age. Presence of these small fossils in the soils at The Forks is likely due to flood action. In addition, Native Pre-Contact use of such fossils, as beads, is a possibility (G. Lammers 1991:pers. comm.).

The third artifact is a small fragment of tar paper, from Pre-Railway/Post-Experimental Farm levels. This could be related to construction activity such as the immigration sheds and shanty town, present in The Forks area from 1872 to 1885.

All other artifacts classed as Miscellaneous Inorganic are chinking fragments. Made of local river clays mixed with straw or grass, chinking was used to fill spaces in timber-constructed buildings. The bulk of the chinking is a distinctive orange-red colour, which is the result of exposure to intense heat. As such large amounts of chinking were recovered, only samples from each unit and lot were curated. Weight was selected as a quantification method, given the friable nature of much of the chinking and the time required to count multitudinous fragments.

Fur Trade levels provided the vast majority of the chinking—93.2% of the total recovered during the 1991 season. Figure 51 illustrates the distribution of the chinking by excavation unit. The higher density areas coincide with the known Fort Gibraltar I structures at Features Q and R.

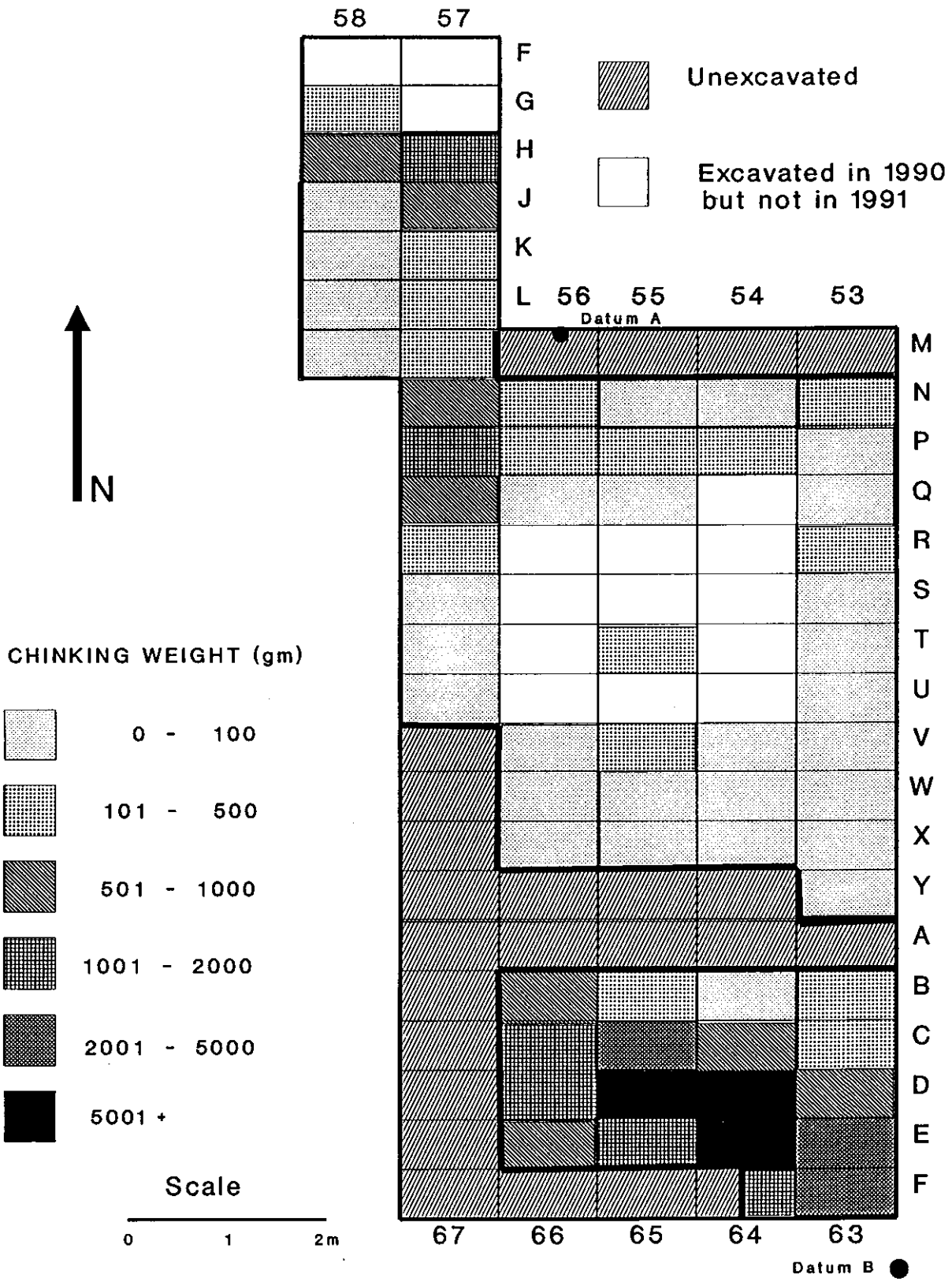


Figure 51: Distribution of 1991 Chinking Recoveries

7.0 Faunal Remains

During the three years of excavation at the Fort Gibraltar I site, the category of *Fauna* has been the largest class of artifacts catalogued. Fauna encompasses bone, ivory, tooth, scale, keratin, eggshell, and mollusc shell. The animals whose remains have been excavated may have been used by site inhabitants for meat, furs, hides, or raw materials (e.g., bone, tooth, shell, feathers, quills). Species, such as small rodents, small birds, and small clams, are more likely to be natural inclusions in the site. Due to processing by site inhabitants and to post-depositional factors, the majority of the faunal remains are recovered as small fragments. While this suggests types of butchering patterns, it can also render species identification difficult or impossible.

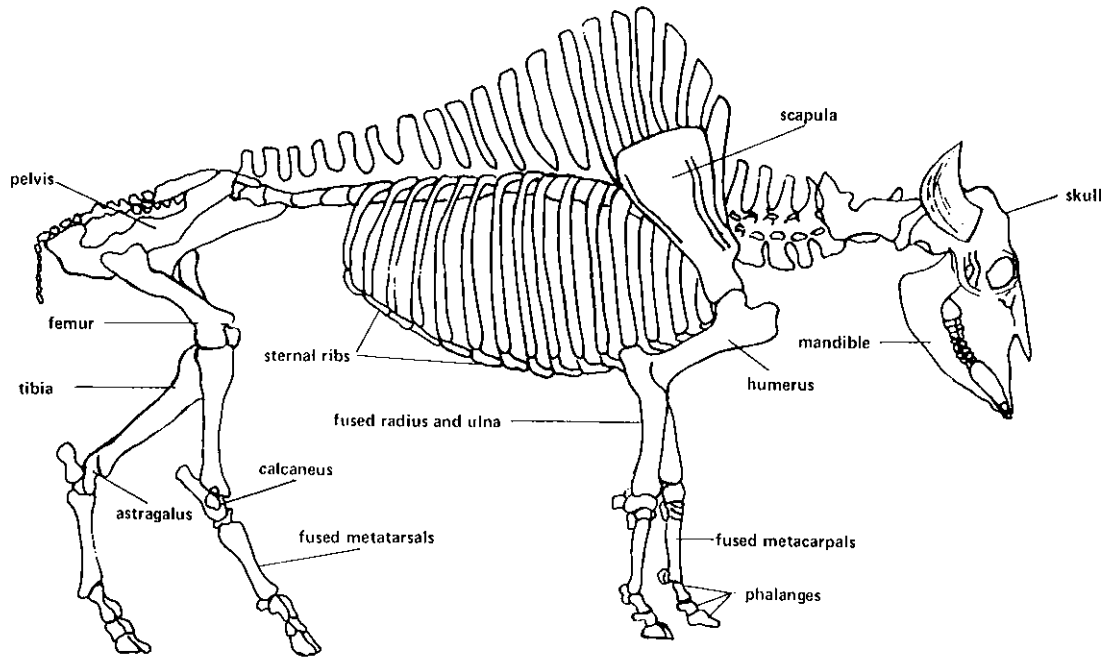
The process of faunal analysis begins with identification of the element or portion of skeleton (Figure 52). This is accomplished through experience, through use of standard references (Brown and Gustafson 1979; Clarke 1981; DeBlase and Martin 1974; Gilbert 1973; Lawrence 1968; Mundell 1975; Olsen 1960, 1964, 1968, 1979; Schmid 1972), and by comparison with a faunal reference collection. Identified elements can then be assigned, where possible, to the lowest taxonomic level. Many fragments, however, can only be identified to class level (i.e., mammal, fish, bird, etc.) or to size categories (i.e., large, medium, small) within the class.

7.1 Taxonomic Identifications

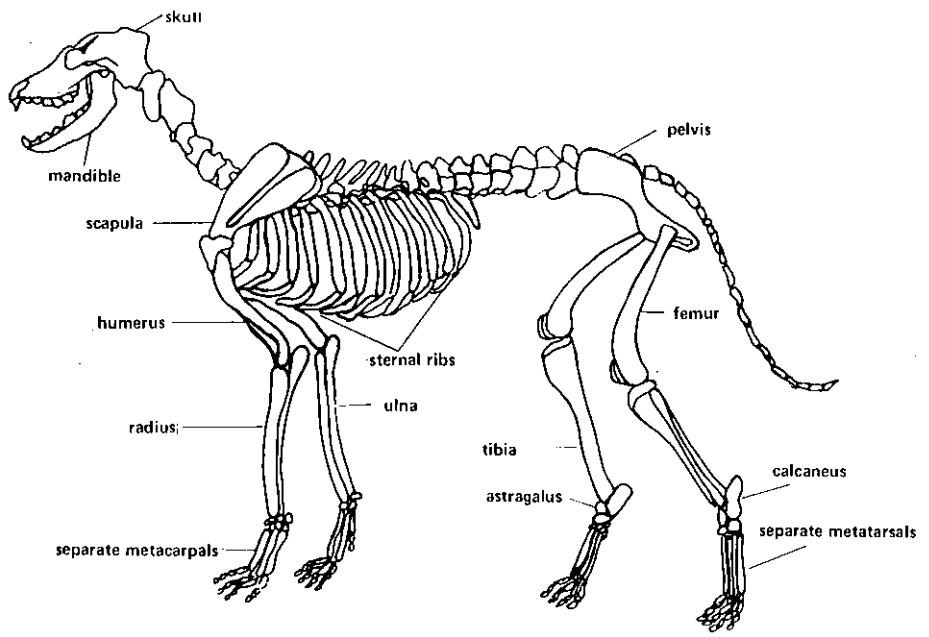
Excluding worked bone and bone artifacts, a total of 24,080 faunal remains were recovered during the 1991 field season. It must be noted that one bone or even one eggshell can be recovered as tens or hundreds of fragments. This can skew the numbers drastically, particularly in small samples. Some units were partially excavated in 1990 and the fauna from the upper levels are not included in the 1991 assemblage. Certain units were not excavated to the base of the fur trade levels, again producing an uneven representation across the excavation area.

Not all events are equally represented. Short-term non-residential events, such as the B&B Construction period, could contain lesser quantities of fauna in the matrix. The railway overburden consists of debris, cinder, and clinkers deposited across the entire East Yard for a century. Due to its lack of locational significance, most of this layer was removed by backhoe and little of the matrix was excavated, screened, and processed. Small numbers of secondary deposited fauna in railway levels would not be an accurate representation of faunal use for the entire period across the total railway activity area. The use of percentages is a partial attempt to overcome these biases.

While identifications were as specific as possible, often the class could be determined but not the species. Within mammals and birds, size categories are used for analysis. Large mammals include cow, bison, deer, moose, elk, bear, pig, sheep, and goat. Medium mammals include beaver, muskrat, dog, wolf, coyote, fox, rabbit, hare, lynx, and badger. Small mammals include squirrel, mouse, and vole. Large birds include swan, goose, and hawk. Medium birds range from kingfisher to duck. Small birds include the perching birds such as thrush, blackbird, and warbler.



Generalized skeleton of a bison.



Generalized skeleton of a canid.

Figure 52: Representation of Mammal Skeletons

7.1.1 Mammals

The total mammal recoveries for all events is 12,321. The animals represented range in size from mouse to bison. Identified species are tabulated by event in Section 7.3.

Domesticated species are represented by sheep/goat, pig, and horse. Much of the *Bison/Bos* and the undifferentiated artiodactyl may be cow. This is especially likely in the later events. It is difficult to differentiate between the three *Canis* species (wolf, dog, coyote), particularly as many of the Native dogs were wolf-like in appearance. Some of the undifferentiated *Canis* remains may be domestic dog.

Wild animals are present, particularly in the 1826 Flood and Fur Trade events. The presence of certain species may seem unusual given the current urban context of the site. However, all of the identified species would have been available, even common, in the surrounding area. Bison were the dominant species of the grasslands. Alexander Henry described both bison and wapiti (elk) as being "everywhere in sight" and wapiti were "seen continually in droves near the woods" (Bird 1961:63). Henry also noted the abundance of black bear: "... their dung lies about in the woods as plentiful as that of the buffalo in the meadow" (Bird 1961:66). Bird (1961:67) states that the Canada lynx was trapped in southern Manitoba until ca 1915. A large member of the weasel family identified from the 1826 Flood event is likely mink, another fur-bearer once common in the area. The list of mammal species (Appendix B) represented provides an indication of previous lifeways as well as how much the natural environment has been impacted over the last two centuries. Development of urban areas as well as agricultural practises have eliminated most of the natural habitats thereby forcing the animals to relocate to unaltered areas. Some species such as bison and passenger pigeon have been exterminated through most or all of their natural range.

The Sciuridae (squirrels) are usually various species of ground squirrels, although red squirrel has been tentatively identified. The Muridae category refers to mouse and vole remains. These small rodents are likely natural inclusions in the site rather than subsistence remains. Evidence of rodent tunnelling is abundant in the soil at the site.

7.1.2 Birds

A total of 638 bird remains were excavated and identified during the 1991 season. Of these, 177 are eggshell fragments. The majority of the identified bird remains are waterfowl. This is not surprising as the site is located at the junction of two major rivers. These specimens include swans, geese, ducks, and mergansers (Appendix B). The swan remains were identified as trumpeter swan. While never abundant, this bird did nest in Manitoba (Godfrey 1966:48). Goose remains likely include both Snow and Canada goose. The majority of duck specimens were identified as mallards and black ducks. Although scaup and pintail have been tentatively identified, for the purpose of this analysis they have been grouped within the duck sub-family (Anatinae). Merganser remains are also present, but could be identified no further than sub-family. All of these waterfowl nest and/or migrate through this region.

The remains of small shorebirds were recovered, as well as those of small perching birds such as thrushes. Hawks, recovered from the 1826 Flood horizon, are common in the area. Passenger pigeon was not identified. Future research may yet ascertain their presence in the faunal assemblage, particularly from the Fur Trade period. Their great abundance is mentioned by a number of early travellers in the area—1878 is recorded as the year of the last big flight into Manitoba (Seton, in Bird 1961: 61). Bird remains represent species utilized for meat or raw material. Some specimens may be natural inclusions in the site.

7.1.3 Fish

A total of 8469 fish remains, including bones, scales, and scutes, were identified in the 1991 faunal assemblage. As many fish bones are extremely light and fragile, they do not preserve as well as the larger, denser mammal and bird bones. Similarly, the denser bones of large catfish and sucker preserve more readily than do those of smaller species. Therefore, it is possible that this class and the smaller species within it are underrepresented.

Due to the small size and friability of the bones, as well as the inter-species similarity of numerous elements, many of the remains could not be identified beyond the class level. Catfish remains were identified to the genus level (*Ictalurus*). *Stizostedion* remains may be walleye or sauger, while *Hiodon* fragments may represent mooneye or goldeye. Sturgeon (*Acipenser fulvescens*) scutes (the bony exoskeleton) are distinctive in appearance and may be slightly overrepresented in the identified sample. Sucker is identified to the family level (Catostomidae). Freshwater drum (*Aplodinotus grunniens*), freshwater burbot (*Lota lota*), perch (*Perca* sp.), and pike (*Esox lucius*) were also identified (Appendix B).

All of the identified species can still be found in the nearby rivers. The present populations are reduced from Contact levels and the average size of the fish is smaller. The bulk of the fish remains would represent subsistence activities, although natural occurrences are possible.

7.1.4 Molluscs

The faunal assemblage included 1216 bivalve shell specimens, 101 gastropod remains, and a small number (9) of undifferentiated bivalve/gastropod fragments.

Bivalves included freshwater clam (Unionidae), which were likely used as a subsistence resource as well as for raw material (shell). Also present were Sphaeriidae, commonly known as fingernail clams or pea clams. Some of the Unionidae, as well as all of the Sphaeriidae, are likely natural inclusions at the site, deposited by flooding.

Gastropod remains included specimens of both the Planorbidae (ramshorn or flat snails) and Lymnaeidae (spiral snails) families. These are aquatic species, which would be natural inclusions due to the flooding of the Red and Assiniboine rivers.

7.1.5 Amphibians

The identified amphibians are all *Anura* (frog or toad). These animals burrow into soft or sandy soil for winter hibernation. Their remains can be considered natural deposits. Three hundred and forty-nine amphibian fragments were recovered and identified.

7.1.6 Undetermined Class

This term refers to fragments that could not be positively identified to a class level. Extremely small fragments of bone could represent mammal, bird, or fish. In the 1991 assemblage, 895 fragments or 3.7% of the total faunal recoveries could not be assigned to a class.

7.2 Butchering

Animals may be butchered differently depending on a number of factors including their intended use, size/weight, and distance from the kill site. Many aspects of processing, such as drying strips of meat, leave little or no evidence on the preserved bones. It is possible that some of the meat consumed at the fort was butchered elsewhere. Accordingly, the archaeological evidence may only demonstrate a portion of the diet and the processing techniques.

The processing of animals for various purposes can leave evidence on the bones—cut marks, chopping marks, breakage patterns. Cutting, sawing, and chopping marks may be due to skinning, disarticulation (or separation) of skeletal elements, meat stripping, cutting of cartilage, etc.

Presence or absence of certain elements (i.e., phalanges) provide evidence of butchering practices. For example, when a large animal, such as a bison, is butchered off-site, non-edible portions (i.e., skull, feet) are left behind and do not appear in the faunal assemblage.

7.2.1 Mammal Butchering and Processing

As the majority of the mammalian faunal sample was recovered from Fur Trade levels, the bulk of the butchered bone was also found in these levels.

Large ungulate bone (elk, bison) predominates in the chopped/cut bone category. Evidence of chopping is more frequent than that of cutting. Based on butchering marks and element representation, some patterning is evident. Sides of the animals were removed by chopping through ribs at the vertebral and sternal attachments. Quarters appear to have been subdivided at various locations, including the proximal radius/ulna, the distal metapodial, and at the phalanges. A scarcity of skull and vertebral fragments suggests that these portions were abandoned at the kill site, although quarters appear to have been transported in entirety. Many of the fragments are long bone shaft fragments, often too small to be identified to species or to element. This breakage pattern suggests fairly intensive processing of the animals, presumably for marrow extraction. There appears to be a preponderance of shaft fragments as compared to articulating ends.

As in many Pre-Contact sites and some Fur Trade sites, this may indicate the processing of these epiphyseal ends and some of the shafts for the production of bone grease. In this process, the bones are broken into small fragments (Zeirhut 1967:35) and then boiled to extract the fat (Paget 1909:78). The resulting bone grease, variously termed marrow fat, soft fat, and grease (Hurlburt 1977:19–21) was consumed directly or used for making pemmican. The product has been described as ". . . . quite hard like tallow, and has the appearance and very nearly the flavour of the richest yellow butter" (Catlin 1926:131). Considering that one of the functions of Fort Gibraltar I was provisioning, this activity is probably linked to pemmican manufacture.

The horse remains were recovered from a Fur Trade level and appear to represent one butchering event. A scapula blade fragment (21K57R8-10764) was recovered at a distance from the others. This was gnawed and may have been moved by a dog.

In the faunal assemblages of the post-1826 Flood periods, the emphasis shifts from wild species to domestic animals, generally the smaller artiodactyls such as pig, sheep, and goat. The recovered elements (vertebrae and lower leg bones) suggest that initial butchering occurred on-site, with subsequent processing occurring elsewhere. The bones display saw

marks, as opposed to chopping or cutting marks found in the earlier assemblages. These marks indicate that the carcasses were sawn through the vertebrae to remove the sides. Lower legs were removed by sawing. The two identified sheep teeth (21K53R4-13679 and 21K54X2-14105) are both deciduous or immature teeth, indicating the presence of young animals.

The butchering pattern of medium-sized mammals, particularly beaver and muskrat, is different from that of larger animals. Hares, rabbits, canids, bear, lynx, and members of the weasel family tend to be represented in the Fur Trade period by teeth. This is puzzling and may be due to the small sample size, the fact that enamel preserves better than bone, or the ease of identification of these elements. Medium mammal limb bones were present throughout the site, but fragmentary shafts of these bones are difficult to identify to species.

The bulk of the beaver and muskrat bone was recovered from Fur Trade and 1826 Flood levels. Beaver is represented mainly by lower limb bones such as carpals, tarsals, metapodials, and phalanges, although other elements are present to a lesser degree. Cut marks are evident on one ulna and a rib, presumably due to butchering as opposed to the initial skinning process. Incomplete fusion of some of the beaver elements also indicates a range of maturity of the individuals.

The remains indicate that either the entire beaver was frequently brought to the site or that initial skinning did not remove the lower limbs. As well as being hunted for its fur, beaver was commonly eaten. Many fur traders have commented on its flavour.

> *The flesh of the beaver is much prized by the Indians and Canadian Voyagers, especially when it is roasted in the skin, after the hair has been singed off. In some districts it requires all the influence of the Fur Trader to restrain the hunters from sacrificing a considerable quantity of beaver fur every year to secure the enjoyment of this luxury . . .* (Richardson, 1819:106).

> *The trappers esteem the tail a great delicacy, and the flesh of the young Beaver is really excellent, and very like that of young pig* (King 1866:37).

Muskrat elements are more equally represented than are the beaver elements. Given the small size of the animal, it was probably returned whole to the site. Muskrat was also utilized as both meat and fur. While no cut marks were noted, the breakage of the long bones suggests the subdivision of the carcass for consumption.

The recovered medium mammal limb bones may be associated with the harvesting of animals for pelts. In addition, literature sources attest to the consumption of many species (hares, rabbits, squirrels, canids, bear, lynx, and members of the weasel family) by fur traders and explorers (Hurlburt 1977:47–49). Evidence of chopping on a large canid femur (21K53R8-10080) suggests the use of dog or wolf as a meat source.

7.2.2 Bird Butchering and Processing

The majority of remains from large and medium birds were recovered from Fur Trade and 1826 Flood levels. Although many limb and breast bones have been identified for the large and medium bird species, unidentifiable shaft fragments predominate. One duck humerus (21K57R8-10763) exhibits chop marks, while the distal tibiotarsus of a swan (21K66C9-13560) has been cut. The paucity of butchering marks suggests that most birds were processed as complete carcasses.

The preponderance of large and medium waterfowl suggests the use of these birds (ducks, geese, and swans) as a subsistence resource. Swan skins were traded by both the North West Company and the Hudson's Bay Company (Hurlburt 1977:59).

7.2.3 Fish Butchering and Processing

The processing of fish for consumption is generally very basic and leaves little evidence on the bones. Cut marks are evident on four fragments from Fur Trade and 1826 Flood levels. These cut marks indicate the removal of the head as well as splitting the body of the fish. It is expected that larger fish would require more processing than smaller ones, which could be consumed with little modification. During the Fur Trade period, fish was likely dried or frozen as well as consumed fresh. Fish was commonly used as a dog food, while there are archival references to the manufacture of a fish pemmican.

7.3 Discussion of Faunal Recoveries By Event

The faunal remains are examined within the appropriate time periods for the purpose of identifying changes in utilization of faunal resources. These analyses can indicate variation in diet, changes in use of species, as well as presence or absence of species.

7.3.1 Railway Period

The Railway levels yielded the smallest faunal assemblage of all the events. The railway fill consists of cinders or clinkers and contains little in the way of fauna.

Bird, fish, gastropod, and amphibian remains are absent in the Railway faunal assemblage (Table 14). The major identified species is domesticated pig (*Sus scrofa*), represented by a male canine and an unidentified tooth. Tooth fragments represent 29 of the 31 specimens identified as pig. One *Canis* tooth may be from a domestic dog. The other mammal fragments (32) may represent pig or other domestic species.

IDENTIFICATION	QUANTITY	
MAMMAL		64
Undifferentiated Mammal	30	
Medium/Large Mammal	2	
Pig	31	
Wolf/Dog/Coyote (*Canis* sp.)	1	
BIVALVE		2
Fingernail Clam	1	
Freshwater Clam	1	
TOTAL FAUNAL REMAINS		**66**

Table 14: Identified Faunal Remains, Railway Period

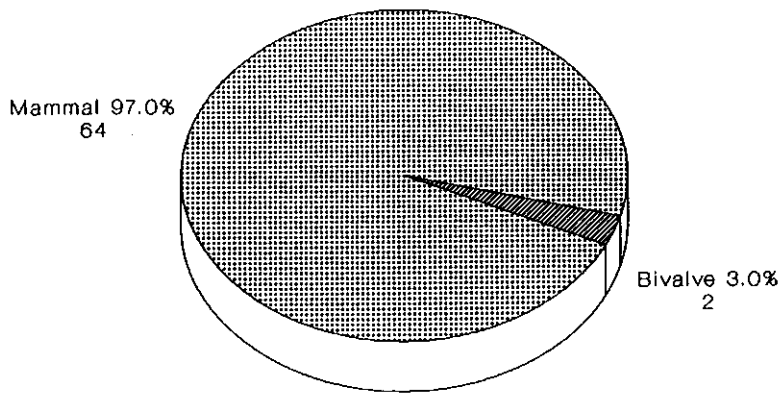


Figure 53: Frequency of Faunal Recoveries, Railway Period

Pig remains were also recovered during the 1990 field season. It was suggested that they may represent refuse from railway food services incorporated into the fill.

The railway samples from the two seasons are radically divergent considering classes represented and the percentages of those classes (Figure 53). The majority of the 1990 sample was fish, interpreted as the remains of fish processing activities of individual anglers. Given that no fish remains were recovered from the railway levels during the 1991 season, this remains a probable interpretation.

7.3.2 B&B Construction Period

The recovered fauna from this event included all classes except bird (Table 15). An overwhelming number of specimens are amphibian. The high percentage of frog/toad (60.4%) is due to the recovery of entire skeletons of individuals who died during hibernation (Figure 54).

The identified mammals include sheep/goat, hare/jackrabbit (*Lepus* sp.), and squirrel (Sciuridae). The sheep/goat remains may be related to railway food services. The squirrel is likely a natural inclusion in the site. The *Lepus* fragment may be natural or related to a cultural activity. Fish remains can be interpreted as the evidence of processing the catch by individual anglers. The small number of fingernail clams (Sphaeriidae) suggests minimal flooding.

7.3.3 Pre-Railway/Post-Experimental Farm Period

The faunal assemblage from this period consists primarily of mammal and fish remains (Table 16). Domesticated animals are represented by sheep/goat and *Bison/Bos* remains, which are probably *Bos* (domestic cow), given the time period represented by these strata. Wild animal remains include squirrel, vole/mouse, and an unidentified carnivore. Subsis-

tence species are therefore represented by domesticates, while the wild species are those naturally occurring at the site.

The bird remains indicate the presence of waterfowl, such as ducks and geese, that would have been locally-hunted subsistence resources. The bone from a perching bird (Passeriformes) may be a natural deposit. The fish remains include a wide range of species possibly indicative of intensive fishing and processing on site.

IDENTIFICATION	QUANTITY	
UNDETERMINED CLASS		**16**
MAMMAL		**30**
Undifferentiated Mammal	12	
Large Mammal	1	
Medium/Large Mammal	11	
Smal/Medium Mammal	1	
Ungulate (Artiodactyla)	2	
Sheep/Goat	1	
Hare	1	
Squirrel	1	
FISH		**62**
Undifferentiated Fish	57	
Catfish/Bullhead	4	
Mooneye/Goldeye	1	
AMPHIBIAN		**189**
Frog/Toad	189	
BIVALVE		**13**
Undifferentiated Bivalve	2	
Fingernail Clam	10	
Freshwater Clam	1	
GASTROPOD		**3**
Flat Snail	1	
Spiral Snail	2	
TOTAL FAUNAL REMAINS		**313**

Table 15: Identified Faunal Remains, B&B Construction Period

The number of bivalves increased from later events, particularly the flood-deposited fingernail clams (Sphaeriidae). This is indicative of the propensity for flooding prior to the railway companies raising the land surface. Amphibian remains are present as natural deposits.

The higher percentages (Figure 55) of mammal and fish remains suggest that more processing of these subsistence resources was occurring at the site than is the case for the later railway-related levels. This is not surprising given the existence of habitation in the area—the immigration sheds and shanty town.

IDENTIFICATION	QUANTITY	
UNDETERMINED CLASS		**60**
MAMMAL		**231**
Undifferentiated Mammal	108	
Large Mammal	8	
Medium/Large Mammal	72	
Medium Mammal	6	
Ungulate (Artiodactyla)	6	
Bison/Bos	4	
Sheep/Goat	13	
Undifferentiated Carnivore	1	
Small Rodent	4	
Squirrel	15	
Mouse/Vole	1	
BIRD		**31**
Undifferentiated Bird	4	
Medium/Large Bird	6	
Medium Bird	2	
Small/Medium Bird	2	
Perching Bird	1	
Duck/Goose	1	
Goose	1	
Eggshell	14	
FISH		**263**
Undifferentiated Fish	245	
Perch	1	
Catfish/Bullhead	11	
Pike	1	
Sturgeon	2	
Sucker	1	
Walleye/Sauger	2	
AMPHIBIAN		**23**
Frog/Toad	23	
BIVALVE		**88**
Fingernail Clam	70	
Freshwater Clam	18	
GASTROPOD		**9**
Undifferentiated Gastropod	9	
TOTAL FAUNAL REMAINS		**705**

Table 16: Identified Faunal Remains, Pre-Railway/Post-Experimental Farm Period

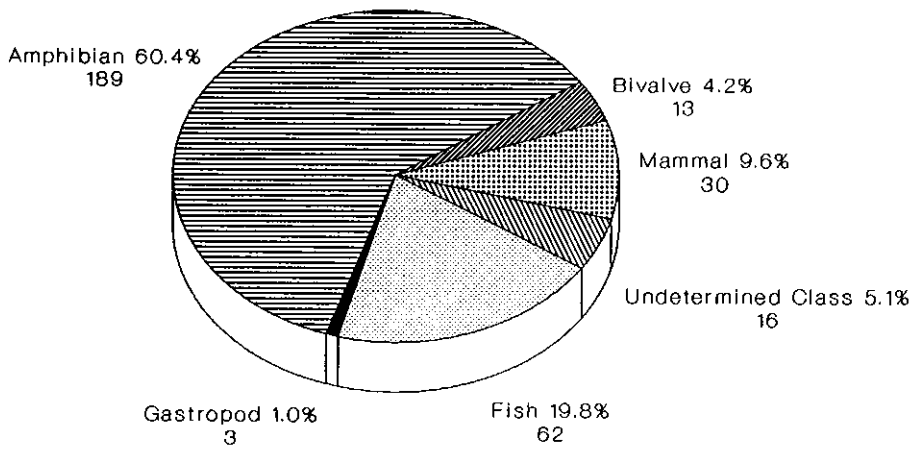


Figure 54: Frequency of Faunal Recoveries, B&B Construction Period

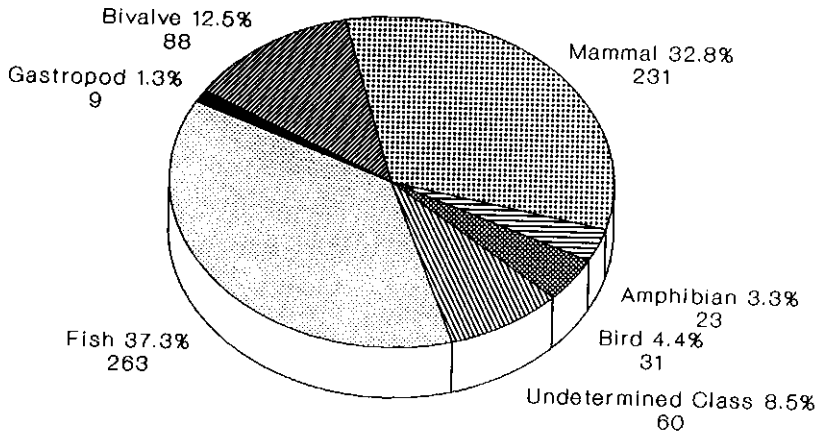


Figure 55: Frequency of Faunal Recoveries, Pre-Railway/Post-Experimental Farm Period

7.3.4 Experimental Farm Period

The Experimental Farm assemblage appears to be similar to that of the Pre-Railway/Post-Experimental Farm period. Two noticeable changes are the actual numbers of specimens (Table 17) and an increase in bird remains, resulting from recovery of eggshell.

The overall quantity is less than that from the later event. The decrease occurs in those species related to subsistence rather than to those species that occur naturally. While the percentages (Figure 56) of mammal, bird, and fish remains are similar, the numbers of all of these have diminished. This may be due to the lack of habitation in the immediate area. Procurement and primary butchering occurs at the site, with most of the more intensive processing occurring elsewhere.

An increase in the types of mammal species is evident. Wild species account for a larger portion of the assemblage than in later periods. This would indicate that the diet of the inhabitants of the area included wild game as well as domestic species.

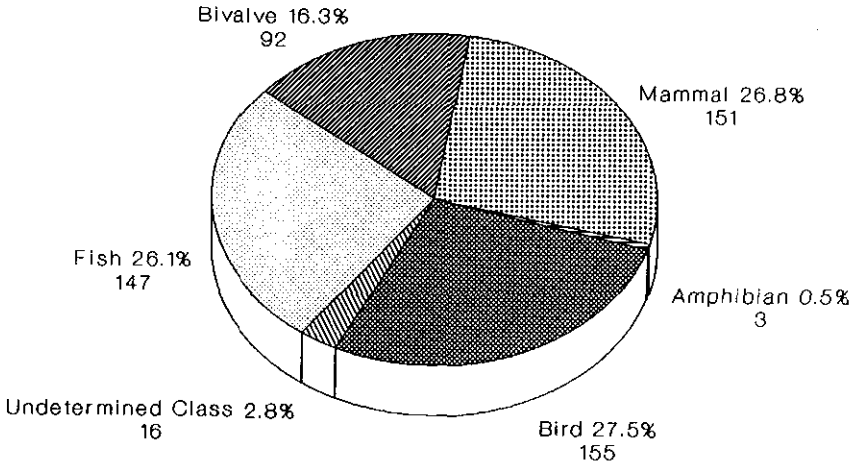


Figure 56: Frequency of Faunal Recoveries, Experimental Farm Period

IDENTIFICATION	QUANTITY	
UNDETERMINED CLASS		16
MAMMAL		151
Undifferentiated Mammal	63	
Large Mammal	1	
Medium/Large Mammal	59	
Medium Mammal	3	
Small/Medium Mammal	3	
Small Mammal	1	
Ungulate (Artiodactyla)	3	
Deer/Elk	1	
Deer	1	
Elk	1	
Sheep/Goat	3	
Wolf/Dog/Coyote (*Canis* sp.)	1	
Pig	1	
Beaver	2	
Muskrat	1	
Squirrel	6	
Mouse/Vole	1	
BIRD		155
Undifferentiated Bird	3	
Medium/Large Bird	1	
Medium Bird	1	
Eggshell	150	
FISH		147
Undifferentiated Fish	140	
Perch	1	
Catfish/Bullhead	3	
Sturgeon	1	
Sucker	1	
Walleye/Sauger	1	
AMPHIBIAN		3
Frog/Toad	3	
BIVALVE		92
Fingernail Clam	82	
Freshwater Clam	10	
TOTAL FAUNAL REMAINS		**564**

Table 17: Identified Faunal Remains, Experimental Farm Period

7.3.5 Pre-Railway/Post-1826 Flood Period

During the 1991 season, the Experimental Farm horizon was treated as a separate event. In a small number of cases, this was not possible. In these instances, especially when postholes were excavated, the strata were analyzed as a single event extending from the 1826 Flood to the beginning of the Railway Period. Notable in this assemblage, much of which has been recovered from the fill of the postholes, is the higher number of small fragments (Table 18).

The small fragment size limits the ability to identify species of mammal, bird, and fish. The identified mammal remains are from very small rodents, while the bivalve sample is exclusively composed of tiny fingernail clams (Sphaeriidae).

The frequency of the identified classes (Figure 57) does not correspond as well to that of the Pre-Railway/Post-Experimental Farm period (Figure 55) as it does to the assemblage from the 1826 Flood (Figure 58). This may indicate that most of the combined context material is actually flood-deposited fill in postholes.

IDENTIFICATION	QUANTITY	
UNDETERMINED CLASS		**9**
MAMMAL		**33**
Undifferentiated Mammal	25	
Large Mammal	2	
Medium/Large Mammal	3	
Medium Mammal	1	
Small Rodent	1	
Mouse/Vole	1	
BIRD		**4**
Undifferentiated Bird	3	
Medium Bird	1	
FISH		**67**
Undifferentiated Fish	63	
Sturgeon	4	
AMPHIBIAN		**2**
Frog/Toad	2	
BIVALVE		**9**
Fingernail Clam	9	
TOTAL FAUNAL REMAINS		**124**

Table 18: Identified Faunal Remains, Pre-Railway/Post-1826 Flood Period

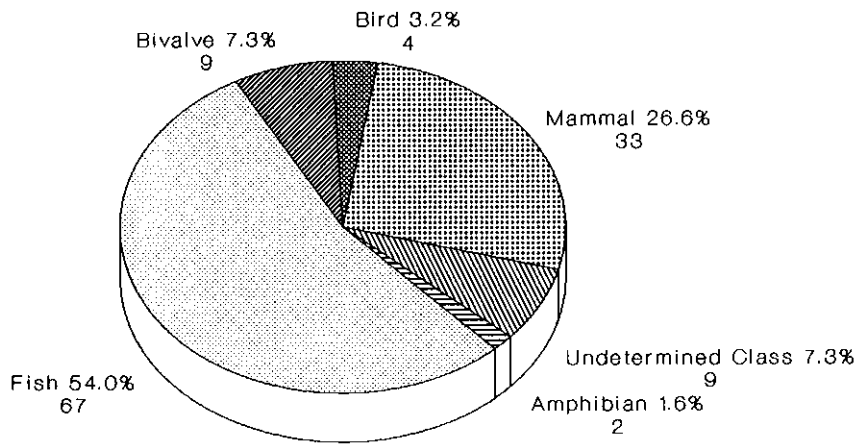


Figure 57: Frequency of Faunal Recoveries, Pre-Railway/Post-1826 Flood Period

7.3.6 1826 Flood Period

The 1826 Flood faunal assemblage shows a marked increase in the amount and variety of animal species. The total number of specimens increases to 8002 (Table 19). It was suggested in the 1990 report (Kroker *et al.* 1991:137) that the majority of the fauna from the 1826 Flood deposits were redeposited from the underlying Fur Trade levels. Given the similarities in species represented as well as the burnt and/or butchered condition of some of this faunal material, the bulk of this faunal assemblage is likely redeposited Fort Gibraltar I material.

As expected, the number of Sphaeriidae (fingernail clams) in these strata is the highest of all the periods. It should be noted that deposition of both fingernail clams and gastropods is probably flood-related. The percentage of fish remains (Figure 58) is higher than in the Fur Trade period (Figure 59). This may be due, in part, to the greater potential for movement of smaller, lighter bone fragments. There is also the possibility that this increase could have resulted from fish being stranded after the waters receded.

The 1826 Flood faunal assemblage exhibits a great variety of subsistence species in mammal, bird, and fish classes. Domesticated animals are represented by pig, sheep/goat, as well as (possibly) cow. A wide range of wild species is present. The increased range of species is also evident in the bird and fish classes.

IDENTIFICATION	QUANTITY	
UNDETERMINED CLASS		271
MAMMAL		2173
Undifferentiated Mammal	1130	
Large Mammal	20	
Medium/Large Mammal	816	
Medium Mammal	62	
Small/Medium Mammal	20	
Small Mammal	6	
Ungulate (Artiodactyla)	16	
Bison/Bos	2	
Elk	1	
Pig	3	
Sheep/Goat	2	
Undifferentiated Carnivore	1	
Wolf/Dog/Coyote/Fox Family (Canidae)	3	
Wolf/Dog/Coyote (*Canis* sp.)	2	
Bear	1	
Rabbit/Hare	1	
Hare	1	
Cottontail	1	
Weasel Family	1	
Small Rodent	12	
Beaver/Porcupine	1	
Beaver	32	
Muskrat	17	
Squirrel	7	
Mouse/Vole	15	
BIRD		134
Undifferentiated Bird	65	
Large Bird	2	
Medium/Large Bird	12	
Medium Bird	17	
Small/Medium Bird	2	
Small Bird	1	
Perching Bird	2	
Shore Bird	1	
Swan	3	
Goose	1	
Duck Sub-Family (Anatinae)	3	
Mallard/Black Duck	9	
Grouse	1	
Hawk	4	
Eggshell	11	
FISH		4461
Undifferentiated Fish	4184	
Perch	2	
Catfish/Sucker Family	10	
Catfish	122	
Sucker	29	
Freshwater Drum	7	
Mooneye/Goldeye	3	
Pike	2	
Sturgeon	75	
Walleye/Sauger	26	
Burbot	1	
AMPHIBIAN		93
Frog/Toad	93	
BIVALVE		851
Undifferentiated Bivalve	1	
Fingernail Clam	795	
Freshwater Clam	55	
GASTROPOD		19
Undifferentiated Gastropod	1	
Flat Snail	8	
Spiral Snail	10	
TOTAL FAUNAL REMAINS		8002

Table 19: Identified Faunal Remains, 1826 Flood Period

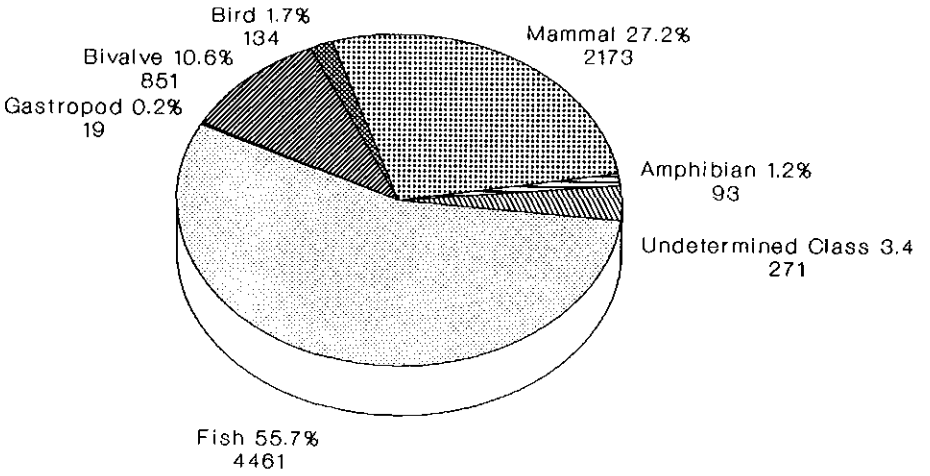


Figure 58: Frequency of Faunal Recoveries, 1826 Flood Period

7.3.7 Fur Trade Period (Fort Gibraltar I)

The increased quantities and range of species, evident in the 1826 Flood Period, are even more notable in this period (Table 20). Mammalian faunal remains comprise 67.5% of the total assemblage (Figure 59). The number of bird remains has increased. Fish remains have decreased in both numbers and percentage from the 1826 Flood assemblage, but are still much greater than those recovered from the periods after 1826. While bivalves have a lesser frequency than in the 1826 Flood assemblage, the emphasis is on the larger subsistence freshwater clams (Unionidae). It is notable that gastropod numbers are higher than in all subsequent periods, although they are a small percentage of the entire faunal assemblage.

This is the sole event where *Bison* is definitely identified as being distinct from *Bison/Bos*. Given the time period of the occupation of the fort, it is probable that the bulk of the undifferentiated *Bison/Bos* from this horizon are also *Bison* remains. The undifferentiated cervids (elk/deer/ moose) are likely elk (wapiti). While domesticated species are present in the form of sheep, pig, and horse, their overall frequency is much less than in all subsequent periods. The horse remains likely represent a single butchering occurrence. The presence of wild species may indicate meat use and/or fur harvesting. The presence of gnawing marks on a number of bone fragments suggests that some of the meat may have been used to feed the dogs at the fort, as well as the people.

An increased variety of species and number of faunal remains were noted in 1989 (Kroker, Greco *et al.* 1990:126–128) and considered characteristic of this event in 1990 (Kroker *et al.* 1991:137). The numbers of species and remains recovered in 1991 are far greater still. The large quantity of faunal remains in Feature W is most likely the cause of this increase.

IDENTIFICATION	QUANTITY	
UNDETERMINED CLASS		513
MAMMAL		9565
Undifferentiated Mammal	6927	
Large Mammal	107	
Medium/Large Mammal	1809	
Medium Mammal	41	
Small/Medium Mammal	16	
Small Mammal	4	
Ungulate (Artiodactyla)	84	
Bison/Bos	405	
Bison	6	
Elk/Deer/Moose	2	
Elk	24	
Pig	1	
Sheep/Goat	5	
Horse	4	
Undifferentiated Carnivore	1	
Lynx	2	
Wolf/Dog/Coyote/Fox Family (Canidae)	3	
Wolf/Dog/Coyote (*Canis* sp.)	4	
Fox	1	
Bear	1	
Badger	1	
Rabbit/Hare	2	
Hare	3	
Cottontail	1	
Small Rodent	17	
Beaver	29	
Muskrat	9	
Squirrel	1	
Mouse/Vole	55	
BIRD		311
Undifferentiated Bird	147	
Large Bird	10	
Medium/Large Bird	39	
Medium Bird	35	
Small/Medium Bird	12	
Small Bird	2	
Perching Bird	3	
Shore Bird	4	
Goose/Duck/Swan Family	13	
Swan	5	
Goose	6	
Duck Sub-Family (Anatinae)	13	
Duck (*Anas* sp.)	15	
Merganser	2	
Grouse	3	
Eggshell	2	
FISH		3435
Undifferentiated Fish	3175	
Salmon Family	1	
Perch Family	1	
Perch	1	
Catfish/Sucker Family	11	
Sucker	43	
Catfish/Bullhead	96	
Freshwater Drum	5	
Mooneye/Goldeye	1	
Pike	3	
Sturgeon	81	
Walleye/Sauger	17	
AMPHIBIAN		30
Frog/Toad	30	
BIVALVE		233
Undifferentiated Bivalve	7	
Fingernail Clam	34	
Freshwater Clam	192	
GASTROPOD		79
Undifferentiated Gastropod	5	
Flat Snail	44	
Spiral Snail	30	
TOTAL FAUNAL REMAINS		14166

Table 20: Identified Faunal Remains, Fur Trade Period

While the mammalian assemblage indicates to some extent which species were available and were being exploited for various purposes by the site inhabitants, it was common for much of the meat from larger mammals to be obtained elsewhere and transported back to the post. Depending upon the degree of processing that occurred at the kill site, much of the meat would have been already stripped from the bones. Thus, the faunal remains recovered from within the fort would represent only a small portion of the meat consumed by the inhabitants.

The bird remains are dominated by waterfowl and grouse, presumably present in greater numbers due to their use as a subsistence resource. The fish remains include the greatest range of species of all periods. While it appears that *Ictalurus* sp. (catfish/bullhead) dominates the sample, this may be due more to the increased likelihood of preservation and identification than to an actual preference for these fish by site inhabitants. Similarly, the high number of sturgeon fragments recorded may be due to their characteristic appearance, and the concomitant ease of identification, than to any actual dietary bias.

The marked increase in gastropod numbers is interesting. Further identification of these gastropods may provide useful environmental data. For example, *Planorbula campestris* (a type of flat snail) is considered characteristic of vernal ponds and spring-time flooded portions of permanent water bodies (Clarke 1981:196). Certain Lymnaeidae species (spiral snails) are characteristic of temporary flood waters or of certain types of aquatic vegetation. Perhaps flooding or high spring water levels were more common during the fort occupation. It is possible that the fort structures inhibited drainage or the low-lying location resulted in longer periods of inundation. Another possibility is that the gastropods were transported into the fort, when riverbank vegetation, such as cattails, was harvested.

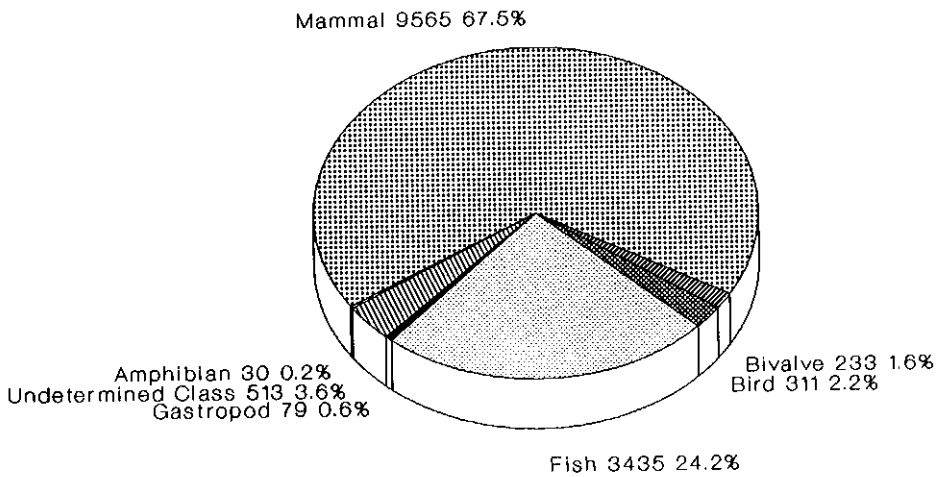


Figure 59: Frequency of Faunal Recoveries, Fur Trade Period

7.3.8 Disturbed Context

Fauna from disturbed contexts totals 140 pieces (Table 21). Little can be deduced from this sample, as it is a mixture of levels and of periods. The high percentage of mammal remains (Figure 60) suggests some Fur Trade levels are included, but with such a small sample, one shattered bone may skew the results.

IDENTIFICATION	QUANTITY	
UNDETERMINED CLASS		**10**
MAMMAL		**74**
Undifferentiated Mammal	11	
Medium/Large Mammal	61	
Wolf/Dog/Coyote/Fox Family (Canidae)	1	
Beaver	1	
BIRD		**3**
Undifferentiated Bird	1	
Large Bird	1	
Mallard/Black Duck	1	
FISH		**34**
Undifferentiated Fish	31	
Catfish/Bullhead	1	
Walleye/Sauger	2	
AMPHIBIAN		**9**
Frog/Toad	9	
BIVALVE		**10**
Fingernail Clam	9	
Freshwater Clam	1	
TOTAL FAUNAL REMAINS		**140**

Table 21: Identified Faunal Remains, Disturbed Context

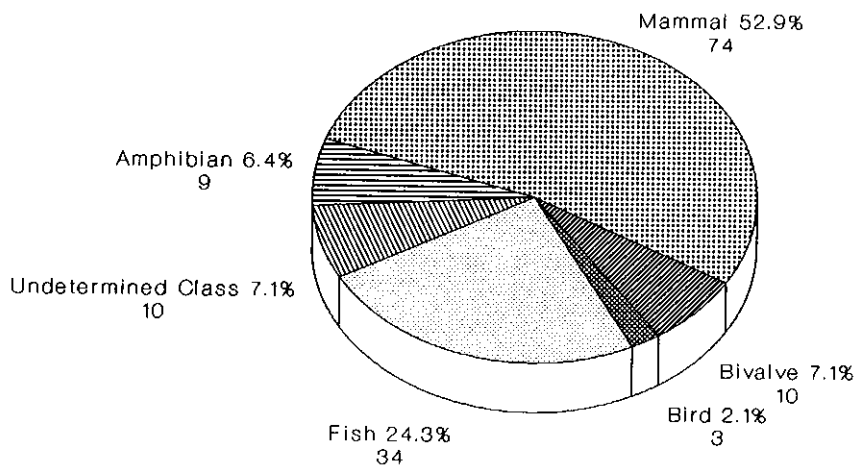


Figure 60: Frequency of Faunal Recoveries, Disturbed Context

7.4 Worked Bone

Excluding the bone bead and bone button discussed in Sections 6.2.3 and 6.3 respectively, nine artifacts have been classified as Worked Bone. Eight of these were recovered from Fur Trade levels, while one was found in the 1826 Flood sand deposits.

A sawn and polished large bird bone shaft fragment, 21K57Q4-8092 (Figure 61a), would ordinarily be termed a bone bead. Two shaped siltstone fragments, 21K57Q4-8091 and 21K57U8-8698 (Figure 61a), were recovered nearby. One of these fragments fits around the bone shaft (24.0 mm in length, 11.2 mm in mid-shaft diameter). Due to the fit between the bone and lithic specimens, it must be considered that they comprise a portion of a composite artifact. The function of such an artifact is unknown, although it could be hypothesized that it served as a gaming piece or as a portion of a pipe stem.

A second bird bone artifact, 21K57S7-14111, is a radius shaft fragment (Figure 61b). The fragment (35.0 mm in length, 3.0 mm in mid-shaft diameter) exhibits cutmarks at both ends and the shaft is polished. It is possible that this artifact is a bead (Miles 1963:Figure 5.38), although some literature describes similar items as gaming pieces or hair tubes (Section 6.2.3).

Three bone artifacts are fragments with drilled holes. 21K53T5-14107 is a small polished fragment with a very small hole (Figure 61c). The function of this artifact is unknown. Excavated from 1826 flood sands, it may have originated in the Fur Trade levels and been redeposited by flood waters. 21K66B11-14109 is a larger mammal bone fragment (Figure 61d). One arc of a drilled hole is present, with slight use wear polish visible. 21K55Q4-10999 is an ovoid bone piece (Figure 61e) with a drilled hole near one end, possibly for suspension as a pendant.

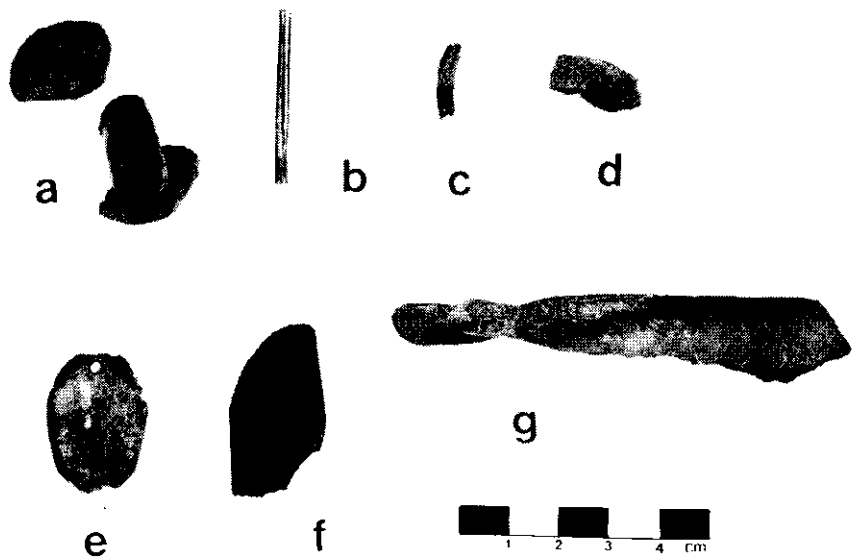


Figure 61: Worked Bone Artifacts

Two artifacts are longer, large ungulate bone fragments, exhibiting some rounding and use wear polish. 21K53Q7-13154 is a rib shaft fragment (Figure 61f) while 21K66B11-14110 is a long bone shaft fragment (Figure 61g). Both recovered from Fur Trade levels, these may be hide processing or marrow extracting tools.

Two small fragments, 21K53P8-11821 and 21K53P7-9751, also display rounding and polish. The first is a mammal long bone fragment while the second is a bird bone shaft. Both appear to be incomplete.

Bone tools are commonly found in Pre-Contact sites. Given the adoption of some Native technology by fur trade employees and the presence within the fort of Native peoples (particularly women), the presence of bone tools in a Fur Trade context is not problematic. Many bone tools require little or no modification. These implements, sometimes termed expediency tools, would likely not have been retained for subsequent uses.

7.5 Non-Culturally Modified Bone

Thirty bones displaying signs of gnawing or chewing, were identified. Twenty-one of these were recovered from Fur Trade levels including two bison foot bones (calcaneus and second phalanx) that were gnawed by rodents. Rodent gnawing is characterized by the presence of long, shallow grooves on the bone surface. The remaining 19 (of the 21) bone fragments, mostly large ungulate bones, were gnawed by carnivores, likely dogs. As the elements represented are ribs, vertebrae, skull, and longbones—all are highly fragmented—the fort's dogs were likely gnawing on the scrap from the butchering and food processing that would have been ongoing at the post. The gnawed swan bone (21K66B11-13311) is a tibiotarsus—a lower leg bone with very little meat. The Fur Trade trench, Feature X, yielded one gnawed beaver scapula fragment, 21K66B10-13097.

Nine other gnawed fragments were recovered. The 1826 Flood event yielded one distal phalanx and two undiagnostic large mammal bone fragments. These may be redeposited Fur Trade Period materials. The Experimental Farm event and the Pre-Railway/Post-Experimental Farm levels each contained two undiagnostic mammal fragments. One fragment was found in a disturbed context. Considering the small fragment sizes, these specimens likely represent scrap from on-site butchering or carnivore scavenging.

Six bone fragments display evidence of digestion. Four small mammal fragments and one bird fragment from the Fur Trade period appear to have passed through the digestive tract. One of these also had evidence of carnivore gnawing. One bone fragment from a posthole has also been digested. These are all very small fragments that were likely consumed by dogs or other scavengers.

A number of faunal pieces also appeared extremely weathered. Many of these derived from Fur Trade levels, suggesting that the scrap from some butchering activities remained on the ground surface for an extensive length of time. Three of the twelve Fur Trade Period weathered fragments were recovered from the ash pit (Feature W), suggesting that this may have also been a refuse pit, as well as a dumping area for ashes.

Weathered bone fragments from the 1826 Flood event are small fragments, either medium mammal bone, or small, low utility bones of large ungulates. The Experimental Farm, Pre-Railway/Post-Experimental Farm, and B&B Construction levels yielded an additional twelve weathered pieces of fauna, most of which are smaller fragments of large mammals.

7.6 Indications of Seasonality

The presence of migratory birds such as ducks, geese, and swans denotes spring to fall occupation. Many of the identified species nest in the region and would have been present during the summer. While the easiest time to shoot migratory waterfowl would be when they congregate during spring and fall, Hurlburt (1977:58) notes that, ". . . birds could have been procured by methods other than shooting, that there were no legal hunting seasons, and that it is unlikely that any of the residents at Fort White Earth would have qualms about shooting sitting ducks."

A small amount (eight elements) of newborn and/or fetal bone was recovered during the 1991 season. All derive from large ungulates. Given the lack of diagnostic characteristics on fetal bone as well as the relative absence of fetal/newborn specimens in comparative collections, it is difficult to determine the exact age of the individual. As bison calve in April/May and wapiti calve during May/June, these specimens would suggest procurement during the spring (Banfield 1974:401, 406). The identified bones are mostly long bones—both epiphyses and diaphyses. Only two specimens could be identified to element: a distal femur (21K56V6-11509) and a metapodial (21K57R10-10831). The metapodial has been cut. Two fetal bones were recovered from Fur Trade levels and five were recovered from the 1826 Flood deposits. A very immature vertebra (21K54V4-8395 to 21K54V4-8402) from a domesticated ungulate was recovered from the Experimental Farm horizon. The flood-deposited bone may be redeposited from Fur Trade levels, easily moved due to its relative weightlessness.

Although beyond the scope of this project, the best indication of seasonality would be a detailed analysis of fish scales. If it is assumed that fish were caught and/or processed throughout the year, frequencies of intense harvesting could be ascertained. In addition, available species for specific seasons could be determined and perhaps correlated with spawning seasons. These periods of intense utilization could correspond with peak populations at the fort, such as the spring arrival of canoe brigades from the east or the fall dispatch of personnel and goods to the wintering posts in the northwest.

7.7 Summary

In the 1990 Fort Gibraltar I report (Kroker *et al.* 1991:134–135), a number of trends relating to the faunal assemblage were summarized.

The first of these trends is the steady increase in the proportion of mammal recoveries with depth—and thus with antiquity. The 1991 assemblage differs somewhat in that the proportion fluctuates. This may be due to small sample size, area specific deposition and/or quantification techniques. Another contributing factor may be the 1991 division of the Pre-Railway/Post-1826 Flood period into two temporal periods—Pre-Railway/Post-Experimental Farm and Experimental Farm. The overwhelming mammalian proportion in Fur Trade levels is greater in the 1991 assemblage than in the 1989 and 1990 faunal assemblages.

The second trend, that the total amount of fauna recovered increases with depth, is substantiated by the 1991 excavations. The total amount of recovered fauna is slightly higher in the Pre-Railway/Post-Experimental Farm event than the previous Experimental Farm Period.

The roughly constant shellfish frequencies from Fur Trade to Pre-Railway events is not borne out by 1991 findings. The gastropod numbers increase in the Fur Trade, while the bivalve frequencies increase in the 1826 Flood levels. This may be due to the separate quantification of gastropod and bivalve in 1991. As noted in 1990, both gastropod and bivalve frequencies decrease in the Railway and B&B Construction events. This would result from the raised ground levels in the Railway Period.

In 1990, the trend noted for bird remains was their relative constancy, with a drop in frequency during the 1826 Flood event. The 1991 recoveries show an increase in numbers of fragments with depth. There is no decrease for the 1826 Flood, but rather an increase during the Experimental Farm period. This results from the recovery of eggshell, the majority of which was excavated from one area. If the eggshell is discounted, the Experimental Farm period actually shows a decrease in bird remains.

The trend in amphibian remains clearly exhibits how the recovery of complete skeletons can skew a small sample. In the B&B Construction event, amphibian remains account for 60.4% of the total faunal assemblage for that event. Many of these remains were spatially clustered and likely are the *in situ* remains of hibernating frogs or toads. Excluding this anomaly, the amphibian remains consistently represent a small percentage of the faunal samples for the other events.

7.8 Comparison of Faunal Data from 1989, 1990, and 1991

In order to analyze the complete faunal assemblage, recovered over the three years of The Forks Public Archaeology Project, the data has been organized into four temporal periods. In the following analysis, the Railway and B&B Construction Periods are combined. Similarly, the 1991 data from the Experimental Farm Period has been included in the longer Pre-Railway/Post-1826 Flood Period (cf. 1989, 1990).

In Figure 62, the classes of Amphibian and Reptile have not been included. Amphibian presence tends to be indicative of soil texture rather than cultural activity or climatic conditions. Minimal representations of reptiles were recorded (three in 1989, one in 1990, and none in 1991). Snails and fingernail clams (Sphaeriidae) have been combined as both are indicative of similar environmental conditions (i.e., flooding and/or standing water). All mammal bone is included rather than attempting to eliminate, on a subjective basis, specimens which may be representative of natural inclusions.

It is evident that the preponderance of faunal recoveries have, over the three seasons, derived from levels that have been attributed to the 1826 Flood and the occupation of Fort Gibraltar I. The total quantities of faunal remains, within each of the four time periods, have been different each year. As each year's excavations focused in a slightly different area, this would indicate that much of the faunal deposition was area specific. While the absolute quantities have varied, the graph does indicate the dominant aspect of fish and mammal remains. This frequency is more easily seen in Figure 63, where the quantities have been converted to percentages of the total faunal recoveries.

Two characteristics are readily obvious. First, there was a difference in the analytic procedure during 1989, wherein a high percentage of small, fragmented bone was categorized as Undetermined Class. Second, some of the temporal periods are more internally homogenous than others. The frequencies of different classes within the Railway Period vary considerably, while those within the Pre-Railway/Post-1826 Flood are roughly constant.

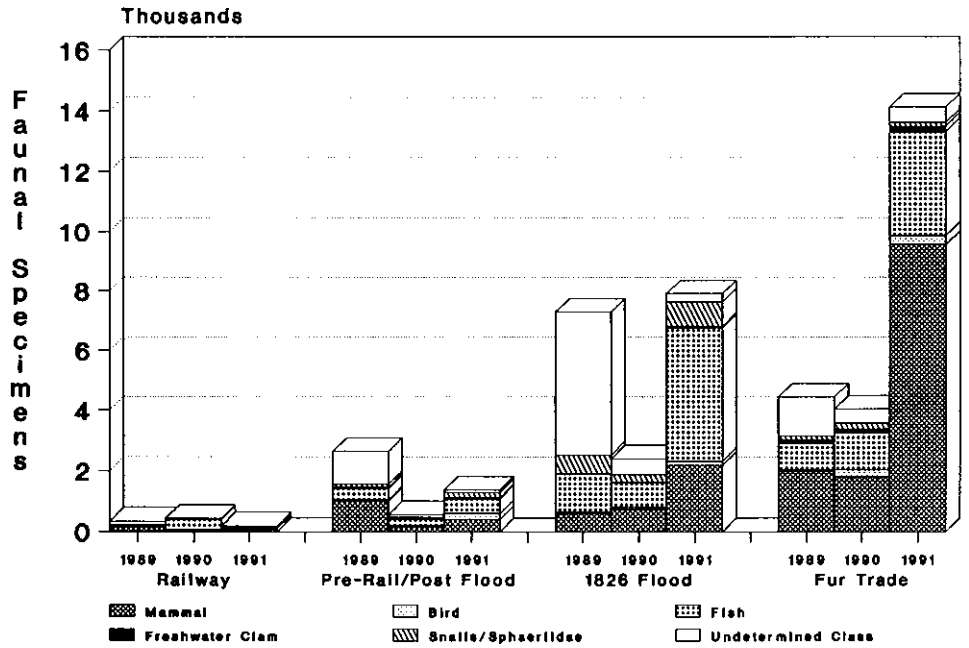


Figure 62: Comparative Faunal Recoveries

In an attempt to obtain similar comparative values for culturally utilized classes of fauna for the three years, the data from Figure 63 was modified to produce Figure 64. The values for snails and Sphaeriidae were eliminated. As in Figure 62, all mammal, bird, and fish recoveries were included, rather than attempting to eliminate possible natural inclusions. The values for Undetermined Class faunal material was apportioned between the three vertebrate classes (mammal, bird, and fish) according to the frequency of the identified material. The inherent assumption is that the small, unassignable fragments would derive from the same species as would the identifiable material and thus would occur in a similar proportion.

Examination of Figure 64 indicates that the class frequencies for the Fur Trade and 1826 Flood Periods are relatively homogenous. The uniformity of frequency is probably due to the short time span of these periods, as opposed to the Pre-Railway/Post-1826 Food and Railway Periods, each of which comprise several decades. The difference in frequencies, especially for mammal and fish, between the Fur Trade Period and the subsequent flood episode may be explained by water action affecting the lighter fish bone more readily than the heavier mammal bone. Fish bone fragments from Fur Trade horizons would have been more likely incorporated into the flood deposits.

The frequencies for the Pre-Railway/Post-1826 Flood Period (1826–1888) are similar for 1990 and 1991. The 1989 recoveries from the northeastern sector of the site display a considerable variance, indicating a different depositional pattern. During the 1991 analysis, the Experimental Farm Period was examined as a discrete event within this temporal period. Using the frequencies of the faunal recoveries from the Experimental Farm Period (mammal—36.5%, fish—35.5%, bird—1.2% after eliminating eggshell), it can be seen that the 1990 and 1991 frequencies for the total period are very similar to those of the Experi-

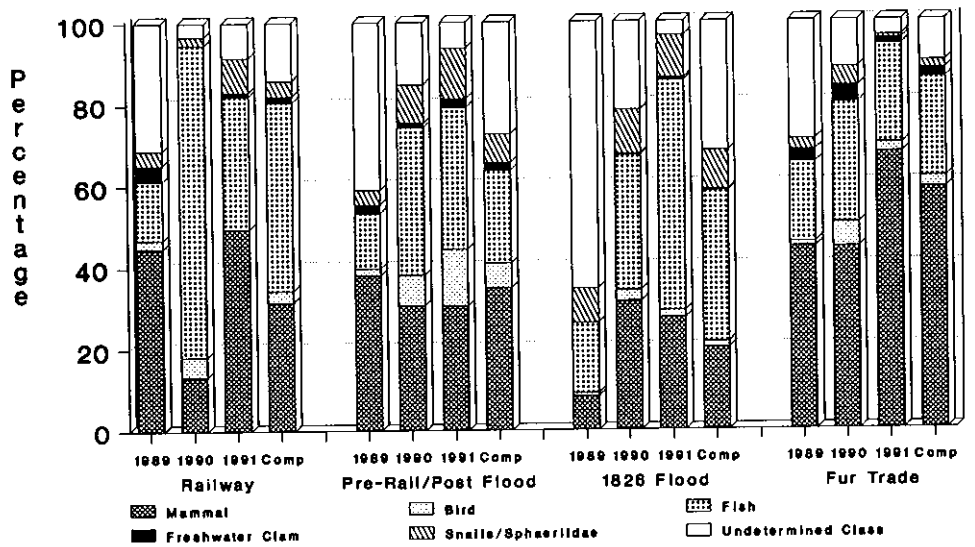


Figure 63: Comparative Frequencies of Faunal Recoveries

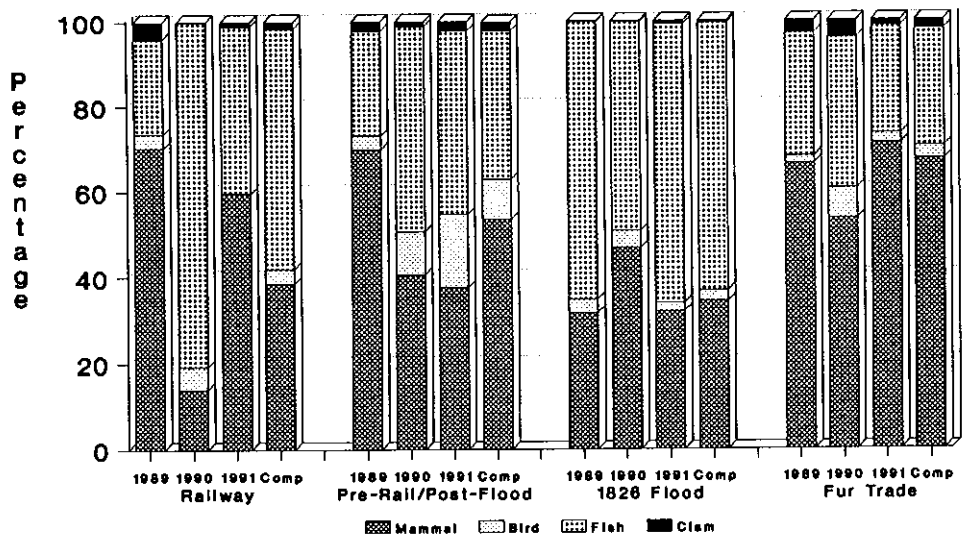


Figure 64: Adjusted Frequencies of Selected Fauna Classes

mental Farm Period. Thus, the 1989 recoveries may be the result of activities related to the habitation during the immigration sheds and shanty town period (1872–1885).

Fluctuating frequencies within the Railway Period are indicative of the area-specific aspect of food refuse deposition which became incorporated into the predominately cinder and clinker fill.

8.0 INTERPRETATION: 1991 FORKS PUBLIC ARCHAEOLOGY PROJECT

8.1 Railway Period (1888–1988)

The major developments of the Railway Period at The Forks are well documented in the historical records of the City of Winnipeg. The excavation site was located on the west bank of the Red River, near the junction of the Red and Assiniboine rivers. The land (formerly called the flats) was low and, in the past, flooded periodically. Prior to being used for railyard development, the surface had to be built up and levelled.

The fill and overburden level, excavated at the site in 1989, 1990, and 1991, overlays the natural soil surface of the area and relates to the Railway Period. About 1.75 m of post-1888 railway deposits were found in the excavation area. Most of this material is composed of by-products of coal-fired steam generation—cinders and clinkers. The materials may have come from either steam locomotives or from the stationary steam plant built in 1947, some 200 m to the west of the excavation.

The cinder and ash matrix contains the bulk of the debris produced by the railway activity. Discarded ties, rails, wood, wire, broken bottles, earthenware jugs and window glass were found throughout the overburden level. Since this thick level of debris has formed a protective cover over the earlier surface, recent activities in the area have not disturbed the buried soils and cultural features at the site.

8.2 B&B Construction (1888–1889)

Considerable archaeological evidence exists for a specific Railway Period event. This was the construction, during the fall of 1888 and into 1889, of a "ten stall roundhouse, a repair car shop, and a blacksmiths' shop, all solid brick and connected with each other under the same roof" (Guinn 1980b:4). This building still stands immediately southwest of the excavation area. It is commonly known as the B&B Building, so named because of its function as the Bridges and Buildings Department depot during the era of railway activity associated with Canadian National Railways. The roundhouse was demolished in 1926. Sub-surface structural evidence of this facility was located during the 1984 CPS excavations (Preiss *et al.* 1984).

Evidence for the event is found in the soil record. One or more of five separate construction-related strata were observed in most of the units. They were thickest in the southcentral portion of the excavation in units 54V, 55V-X, and 56V-X, thinning to the west in units 57R-U. The layers were not present in the 53 and 63 operation lines. Discussions with a retired bricklayer yielded the information that the patterning of the Australian Camouflage layers could have resulted from mortar preparation during cold weather (Kroker *et al.* 1991:149).

Feature B, excavated in 1990, represented the primary evidence of activity during this construction period (Kroker *et al.* 1991). It was a refuse pit approximately 1.5 m in diameter. The upper part of the feature contained 149 bricks. Once the bricks were removed, a variety of other artifacts were recovered from the feature. These included two clay pipe stems, a

medicine bottle, eight metal items, bottle finishes, square nails, screws, fence staples, and fish and mammal remains.

Other artifacts, such as a boot sole, woven wool, a glass doorknob, two glass buttons, two metal buttons and square nails appear to derive from Fur Trade levels, which had been disturbed by the feature. No features relating to the B&B Construction Period were encountered in 1991.

Artifacts, recovered in 1991, that are contemporaneous with the construction activity include bottle fragments, 72 windowpane sherds, 22 sheet-cut nails, five wire-cut nails, six historic ceramic sherds, a piece of wire, a brass object, and a construction staple.

The presence of earlier artifacts, within the lower strata of this period, represents surface disturbance during construction. Material on or immediately below the ground level would have become incorporated in the basal levels of the B&B phase. These include two beads and chinking fragments.

8.3 Post-Experimental Farm to Pre-Railway Period (1848–1888)

During the 1989 site excavation, three distinct strata were defined between the railway fill stratum and the 1826 Flood level. In 1990, these levels were present in the units in the northwest portion of the site and in the extension area. In the 1991 project, the Hudson's Bay Company Experimental Farm was defined as a separate event. Two strata encompass the period from 1848 to 1888.

The upper level (Layer 8) is a mottled, dark brown to tan clay found directly below the Railway Period or B&B Construction deposits. Artifacts recovered from this level include a screw, washer, fence staple, lamp burner, three buttons, three cartridge cases, eight beads, 17 historic ceramic sherds, 86 nails, and a Bannerman pipe stem fragment manufactured between 1870 and 1903.

The lower level (Layer 9), a tan to buff silty clay, contained a lead shot, two fence staples, four historic ceramic sherds, and 58 nails. Two post holes, Features T and U, were located within this layer. Each was approximately 30 cm square and extended down into the Fur Trade levels. Similar post holes (Features C and S) were excavated in 1990. They could relate to a structure or fence.

Two differing hypotheses—based on the 1989 excavations—have been presented as possible interpretations of the stratigraphic sequence for this time period (Kroker, Greco *et al.* 1990:135–136). Hypothesis A was predicated upon the assumption that each of the three recorded historic floods (1882, 1861, 1852) during this period had left evidence of their occurrence. Hypothesis B assumed that, even with the occurrences of the floods, stratigraphic evidence need not have been present.

The 1991 site excavations have provided information indicating that both hypotheses are applicable, albeit not in the same location. The representation of flood water deposition is extremely site specific and may vary considerably over a distance of a few meters. Unfortunately, few temporally diagnostic artifacts were recovered during the 1984, 1989, 1990, or 1991 excavations of these strata. However, the quantities and types of artifacts, such as the Bannerman pipe stem (1870–1903), suggest that Layer 8 represents a cultural level, probably associated with the Immigration Period (1872–1885). At this time, people were living in immigration sheds located west of the excavation area. An adjacent shanty town

existed on the flats from 1875 until 1884. Objects such as screws, washers, nails, ceramics, buttons, lamps, and smoking pipes are everyday household items.

In contrast, Layer 9 contained few artifacts, and given the silty nature of the soil, these may have been incorporated during a flood episode(s). The 1852 flood produced the second highest recorded water levels in Winnipeg. The high water mark was two feet below that of the 1826 flood (Clark 1950:7). Ross (1856:413, 415) noted that:

> *. . . the water had risen eight feet above the high water mark of ordinary years, overflowed the banks of the river, and began to spread devastation and ruin in the settlement. . . . At its height, the water had spread out on each side of the river six miles, for a distance of fourteen miles in length. The people were huddled together in gipsy groups on every height or hillock that presented itself.*

A flood of this magnitude could have deposited the silty clay of Layer 9. The 1861 flood was slightly less severe (Clark 1950:8) and could have provided some of the Layer 8 soil matrix.

8.4 HBC Experimental Farm Period (1836–1848)

The Experimental Farm Period (1836–1848) is represented by Layer 10, a reddish-brown, organic, mottled silty clay. The presence of manure, found within this layer in 1990 and 1991, helps to confirm the presence of domestic animals at the stable complex (Kroker, Greco *et al.* 1990:136). To date, no structural evidence of the farm buildings has been excavated. The Moody map of 1848 depicts a complex of at least five stable buildings in this vicinity (FRC 1988:204–205).

Sheep/goat and pig faunal remains also confirm the presence of domestic animals. The low frequency of these remains may be due to the consumption of these local food resources at places of residence (i.e., Upper Fort Garry, in settlers' homes, etc.) rather than at the Experimental Farm stable complex.

8.5 1826 Flood

The flood of 1826 was a major disaster for the residents of the Red River valley. The flood began on May 5, and the residents sought refuge on high ground at Silver Heights, Stonewall Ridge and Pine Ridge (now known as Birds Hill). Alexander Ross provided an eye-witness account:

> *The people had to fly from their homes for the dear life, some of them saving only the clothes they had on their backs. . . . Hardly a house or building of any kind was left standing in the colony. . . . The country presented the appearance of a vast lake, and the people in the boats had no resource but to break through the roofs of their dwellings, and thus save what they could* (Ross 1856:102–103).

As the flood waters did not begin to recede until June, thick layers of silt and clay would have settled out of the relatively stationary waters. Current interpretation is that the sand stratum (Layer 11) would have been deposited during the first phase of the flood, with the subsequent layers of silts and clays being laid down when the waters slowed or became stationary. Layers 12 and 13 may have been deposited during the first rise of the waters. In fact, they may have originated during minor high water episodes after 1816 and prior to

1826. Faunal recoveries of large numbers of Sphaeriidae and aquatic gastropods support the hypothesis that these layers are the result of minor flooding.

The artifacts from the flood horizon are concentrated in the western portion of the excavation, along with the thickest sand deposits (ca 30 cm). The erosional and transport behaviour of flood waters can explain the presence of artifacts that probably derive from the occupation of Fort Gibraltar I. Lead shot, beads, and chinking, located in this stratum, would have been relocated by the flood waters swirling through the burned ruins of the fort.

8.6 Fur Trade Period

8.6.1 Post-Fort Gibraltar I (1816–1826)

Layer 14, immediately underlying the 1826 Flood deposits, contained the hoof and wheel rut impressions, described in Section 5.2.1. This layer is situated above the debris related to the burning of the residue of the dismantled structures of the fort. It must have been deposited by a minor flood or high water episode that occurred after the summer of 1817 and prior to the spring of 1826. Further archival investigation may be able to ascertain the year in which this layer was deposited and thus provide a sharper focus for the date of the hoofprints.

8.6.2 Fort Gibraltar I (1810–1816)

This section will attempt to draw together the information recovered during the three years of The Forks Public Archaeology Project. To develop a comprehensive picture (Figure 65) of the structures of the fort, it is essential to refer to the recoveries of previous years. These include Feature I (1989, 1990), Feature M (1990), Feature P (1990), Feature Q (1990, 1991), Feature R (1990, 1991), and Feature W (1991) as well as the 1984 recoveries. Details of each of these features have been provided in the relevant sections of each year's report.

A cellar depression, Feature I, proved to be the most interesting feature excavated during the 1989 and 1990 field seasons. Many artifacts were recovered from the feature in 1990, including 1591 trade beads, 394 lead shot, two gunflints, and two trade rings. Another trade ring, which probably originated in the feature, was found in the 1826 Flood level above the feature. The abundance of smaller artifacts such as the beads and the shot is likely due to flood action washing them into the depression. Alternatively, these small artifacts may have fallen through the rough-hewn floor planks of the building above. A similar cellar depression was excavated in 1984 (Priess *et al.* 1986) and the two are perhaps located within the same structure.

Further structural evidence was provided in 1990, by Feature M. Thin, vertical fragments of burnt wood, running east-west for approximately 3 m, were located about 2 m north of Feature I. This feature may represent a part of the collapsed north wall of the same structure that also contained Feature I.

Features P and Q represent further remains of this structure. Feature P, excavated in 1990, was composed of limestone rocks from a chimney collapse. Some of these rocks were revealed during the 1984 Fort Gibraltar I excavation, but were not removed at that time. A similar rock concentration was encountered in 1984 (Priess *et al.* 1986:139), approximately 1 m east of Feature P (Figure 65). The rocks are probably from the same chimney collapse, which may have occurred post-1816.

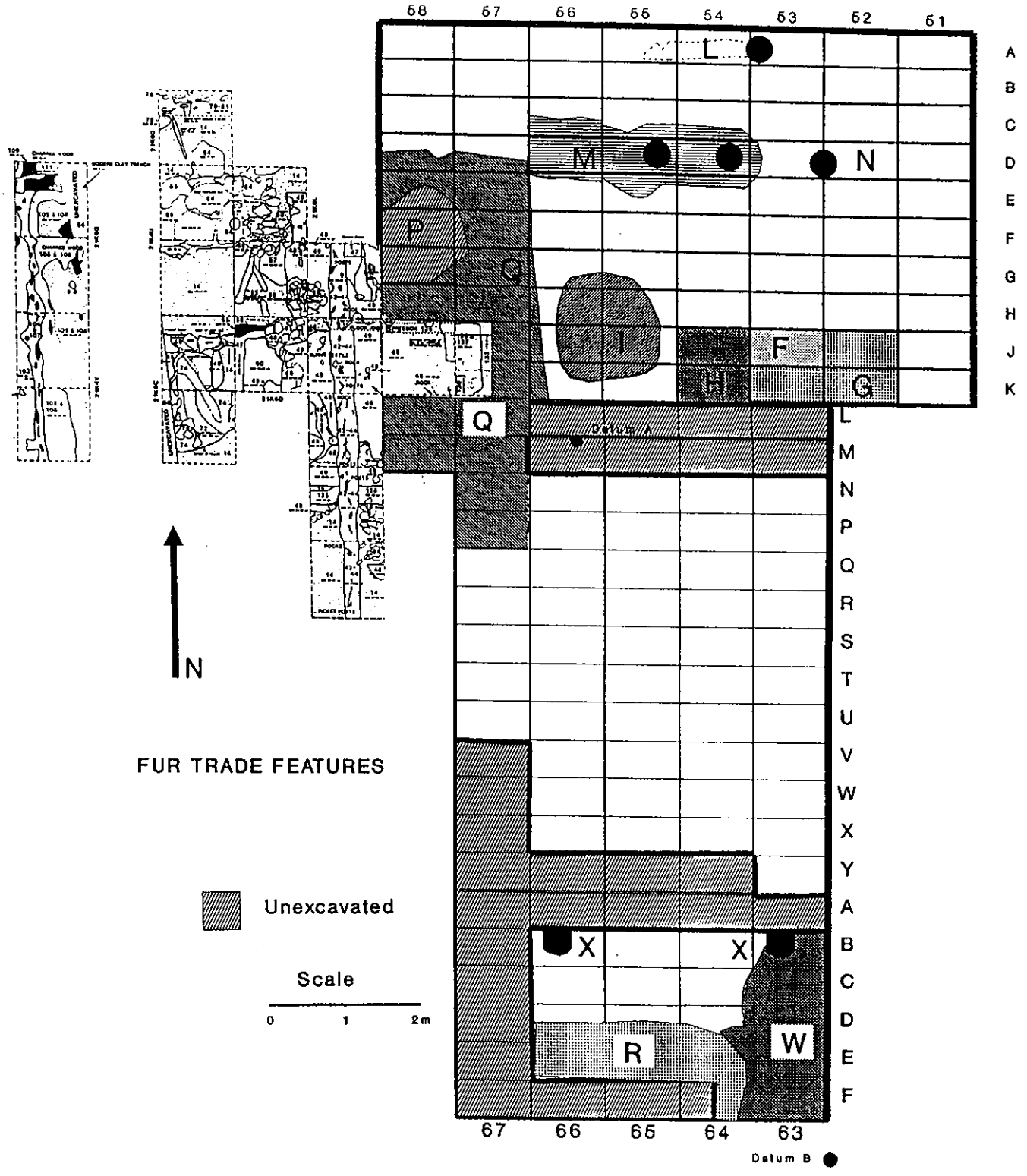


Figure 65: Composite Map of Fur Trade Features

8.6.2.1 Feature Q

During the 1990 field season, a large (11 cm to 30 cm thick) deposit of orange chinking was uncovered. It extended to the north, south and east below the rocks. This chinking formed part of Feature Q. Charred wooden flooring planks, oriented north-south, were found east of the chinking as well as under it. One of these planks was identified as poplar. In some areas the wood had burnt away, leaving a dark carbon-stained clay layer.

Additional charred wooden flooring, oriented east-west, was located in the northern portion of this feature. This wood could be related to the north wall of the structure also identified, just to the east, in Feature M.

Along the eastern edge of Feature Q were two burnt, parallel, wooden poles, approximately 1.7 m long and 5 cm in diameter. The westernmost pole, identified as poplar, was encountered again in 1991. These poles could represent roof supports or stringers.

At the end of the 1990 field season, a deep depression was discovered in unit 58G at the southern end of the feature. Four parallel wood fragments, each approximately 50 cm long and oriented north-south, sloped into the depression. A few wood fragments were located at the bottom of the depression. Artifacts recovered from this depression included two trade rings, a tinkling cone and 24 glass trade beads. Two tinkling cones and another 107 beads were found in other areas of the feature. In 1991, the depression did not extend south into unit 58H. It may represent a short-term storage pit.

Feature Q provides a link with the 1984 project. Excavation of 1984 unit 21K6R ceased once the chinking was encountered. This unit is equivalent to all of unit 58E and part of unit 58F, that had been excavated during the 1990 field season. The chinking and carbon-stained flooring level from unit 21K6S were found to extend north into 1990 units 57H, 57G and 57F (Kroker *et al.* 1991: Figure 19, Figure 27).

In 1991, Feature Q was found to extend into units 57L, 57M, and from 58H to 58M (Figure 18). This area incorporated all of the 1984 CPS units 21K6P and 21K6S as well as portions of units 21K6A, 21K6J, and 21K6E. The carbon-stained flooring level was found in the western part of 1991 units 57H to 57M. Charred parallel timbers, oriented north-south, covered most of units 58H to 58M. These timbers probably represent flooring and have been identified as oak, poplar, and basswood. Excavation below the timbers yielded trade beads and lead shot, which had probably fallen between the floor boards.

An east-west oriented wood fragment, 1.4 m long was found in units 57M and 58M. Part of this fragment was encountered in 1984, in unit 21K6E. No charred flooring was encountered south of this wood fragment. This may be part of the south wall of the structure.

8.6.2.2 Features R and W

Excavations in 1990 uncovered a large feature in the southern end of the site. This feature (R) is represented by a deposit of chinking, charcoal and ash located below the Fur Trade clay. The 1990 artifact recoveries from the ash deposit included a stone platform pipe bowl, a metal knife blade and a few trade beads.

In 1991, large charred timber fragments were exposed in units 64D, 65D, 65E, and 66E (Figure 20). Samples of wood from unit 66E have been identified as elm and poplar. Thin, vertical fragments of wood were uncovered north of these timbers, in units 65D and 66D. These fragments, approximately 25 cm long, were oriented east-west. Similar wood pieces, running north-south, were found in units 64D to 64F.

Feature R probably represents the remains of another structure. The vertical fragments of wood indicate the north and east walls. Further excavation to the south and west is necessary to reveal more of the structure.

The ash deposit, encountered in 1990, and investigated in 1991, was found to be extensive and was treated as a separate feature (W). The western edge of the feature is adjacent to the north-south vertical wood fragments in Feature R. The ash, present in units 63B to 63F, filled a depression 60 cm deep. The feature appears to extend to the east and the southeast, beyond the current excavation boundary. Artifacts recovered from the ash included quantities of faunal remains, a Micmac pipe bowl, a gunflint, and 196 trade beads. This feature probably represents a midden or refuse pit into which ash was dumped. The ash could have been cleaned from a fireplace located within the Feature R structure.

As would be expected in a midden deposit, the faunal remains appear to be primarily scrap—much of which is burnt and/or calcined. Large ungulates are represented by small fragments (often too small for further identification) or by low utility foot bones (e.g., phalanges); medium mammals are represented primarily by teeth and low utility foot bones. A limited number of small molluscs and a few small rodent remains are also present. Evidence of weathering and gnawing on some specimens suggests that bone was not always buried immediately following processing.

The ash or midden deposit is probably the best representation of faunal usage by the occupants of Fort Gibraltar I. Micro-stratigraphy within the ash deposit and fish scale analysis may provide evidence of seasonal variations in the diet of the fort inhabitants.

8.6.3 Fort Construction Techniques

The North West Company usually built rectangular structures, also known as row housing. Three construction techniques were employed in the manufacture of these structures: post-on-sill, post-in-ground, and single log (Janes 1974). In the first technique, large squared logs were set on a levelled ground surface, forming a frame or sill for the foundation (Figure 66a). Squared uprights were set at various intervals, via mortices, into this sill (Figure 66b). Horizontal logs were then slid in grooves between the uprights (Janes 1974:28).

The second technique (Figure 66c) involved placing large upright posts in the ground at intervals. The above ground portion of the posts were generally shaped into a square cross-section by using broad-axes. The portion that was below the ground surface was left round. The posts had vertical grooves into which tenoned wall logs fit. For additional stability, the first horizontal log (Figure 66d) was sometimes set into the ground (Tottle 1981:56).

In the third technique, large sill logs were placed on the ground and single logs, notched at the corners, were laid horizontally on the sill (Janes 1974:28; Klimko 1987:43). No upright posts were used.

One or more techniques could be used to construct different buildings within the same fort or trading post. In Fort Alexander, constructed in 1817, one building was made by the post-in-ground method and another by the post-on-sill method (Janes 1974).

Structures usually had wooden flooring, although some rooms could have had a clay floor. Floor joists were also used and the flooring was nailed to them. The joists commonly abutted the walls or the sills (Janes 1974:31, 54).

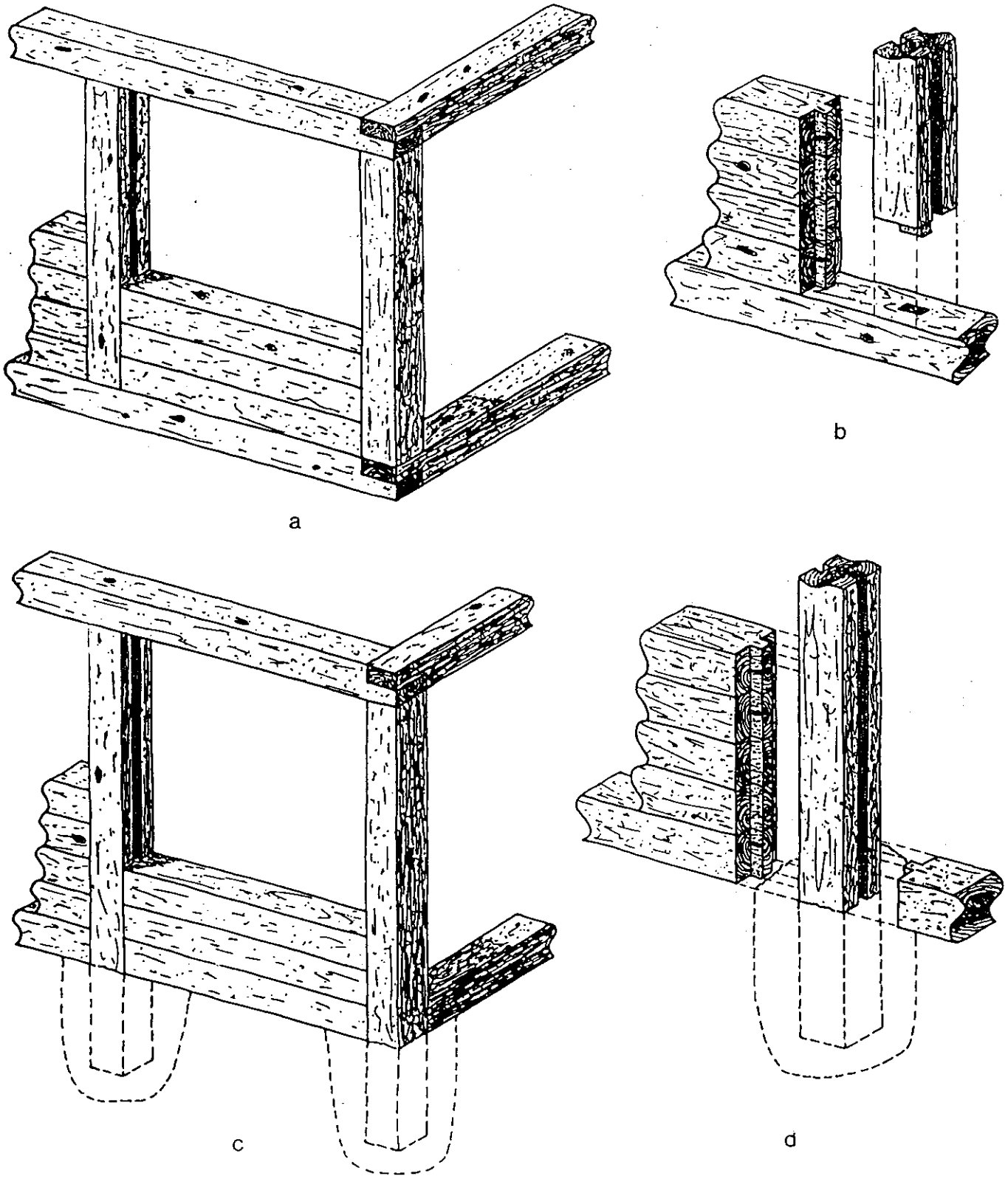


Figure 66: Construction Techniques (Steer *et al.* 1979:375)

As Fort Gibraltar I was dismantled and burned, it is difficult to determine the method of construction employed. Little evidence of the outer walls remains, and it is uncertain if the vertical wood fragments in Features M and R represent posts from a post-in-ground construction. No large sill logs such as those used in the post-on-sill method were found.

The 1984 CPS excavation revealed evidence of a building interpreted as row housing. This structure could have been 4.5 m wide and at least 7.0 m long (Priess *et al.* 1986:128). Three outer walls and a possible inner wall were found. The west wall was represented by a dense amount of wood-impressed chinking, and charred wood fragments in a linear band 16 cm to 24 cm wide and 4.0 m long (Priess *et al.* 1986:132). These remains were located approximately 5 m west of Feature Q.

The back edge of the fireplace hearth, the truncation of the carbon stained flooring along the northern edge of unit 21K6L, and the east-west turn of chinking in unit 21K6G, perpendicular to the west wall beam chinking, are seen as evidence of a north wall (Priess *et al.* 1986:133). Feature M, excavated in 1990, probably represents an easterly extent of this north wall. Evidence for the south wall has been discussed above.

Priess *et al.* (1986:133) speculated that the structural evidence, located in 1984 units 21K6P and 21K6S, represented an inner wall of a building. This area, extending from unit 57H south to unit 57M, was further investigated in 1991. The large quantity of chinking and ash recovered from these units could be representative of the outer east wall of the structure rather than an inner wall.

Feature I, excavated in 1990, and located just beyond this east wall, could be located in another building, adjacent to or attached to the structure. This feature may represent a hangard—a store-house for meat and other food. These were similar to modern root cellars or to semi-subterranean store-houses (Fladmark 1976:175). A hangard was excavated at the NWC Fort St. John (1806–1821) in British Columbia. The feature was unlined, uncribbed, and had no storage shelves or racks (Fladmark 1976:176). These characteristics are the same as those of Feature I, indicating that it may represent one of the hangards mentioned by Roi in his description of Fort Gibraltar I:

> *Within the said enclosure were built the house of the partner, 2 houses for the men, a store, two hangards or stores, a blacksmith's shop and a stable; there was also an ice-house with a watch-house (guerite) over it; these houses were good log houses, large and inhabited* (Coutts 1988:79).

Mennie refers to three houses (64 feet, 30 feet and 28 feet long), a store (22 feet long), and a detached kitchen (15 feet long) as the fort buildings (Coutts 1988:80). He does not mention the hangards, which could indicate that they were contained within other structures such as the kitchen and the store. Based on its dimensions, the structure represented by Feature Q and the 1984 excavations could be the store.

Further excavation is necessary to reveal more evidence of the structures represented by Feature Q and Feature R, as well as to fully investigate the Feature W ash deposit.

8.6.4 Activity Areas at Fort Gibraltar I

The artifact recoveries indicate that some activities were carried out in the areas between the buildings of the fort, represented by Features Q and R (Figure 17). Each activity leaves behind some evidence—flakes from stoneworking, scrap from metalworking, and organic debris from woodworking.

Concentrations of lithic artifacts, primarily debitage flakes were located in unit 57R and adjacent units. This is interpreted as the residue from the manufacture of a stone tool (e.g., a gunflint) from a chert nodule or the flakes produced during the reworking of an exhausted gunflint. Similarly, the densest occurrence of metallic scrap fragments occurred in the same area, albeit slightly to the south (Figure 41). Most of the triangular iron fragments derive from units 56V and 55V and probably represent a specific manufacturing process—the end result of which is, as yet, unknown. A concentration of cuprous material occurs in the same area. This may be the residue from the manufacture of tinkling cones from unserviceable copper kettles. It would seem that this location was used for individual activities relating to tool manufacture and craft production.

Another activity-specific deposit was located south of Feature Q. A layer of organic material, consisting primarily of small wood and bark fragments, occurred in units 57P to 57T. This could have resulted from log and timber preparation during the construction of the buildings of Fort Gibraltar I, manufacture of furniture, or preparation of firewood.

An activity area relating to subsistence activity is interpreted from the faunal remains located in units 53Q and 57R. Bones, identified as horse, were concentrated in this location and probably represent a butchering activity. Alternatively, the animal was butchered elsewhere and the bones were deposited at this spot.

8.6.5 Occupations Prior to Fort Gibraltar I

Some tantalizing evidence has been recovered which gives rise to the possibility of habitation at the site prior to the establishment of the fort in 1810. Artifacts have been located in undisturbed layers under those associated with the period of the existence of Fort Gibraltar I. The most notable artifact is the fragment of the French triggerguard (21K66B11-7759). This specimen has an earlier timeframe than Fort Gibraltar I and, as previously discussed, may represent an earlier visitation at the site. Some faunal remains, particularly elk vertebrae and a premaxilla (part of the skull), were recovered from soil layers beneath the Fort occupation horizons. Two beaver bones from the same horizon show cutmarks that indicate butchering for consumption. Migratory waterfowl and fish bones are also present.

This evidence would suggest an occupation which was more than short-term, i.e, overnight or a few days. Archival evidence lists several specific occupations at The Forks (Guinn 1980a; FRC 1988). The possibilities as to the identity of these occupants are numerous:

- Dorion in 1803
- North West Company camps from 1800 to 1808
- a Saulteaux camp in 1800
- an Ojibwa and Ottawa camp immediately prior to 1800
- a North West Company camp in 1793
- Bruce and Boyer during the winter of 1781–1782
- St. Pierre during the winter of 1752-1753
- a Cree camp in 1738

- La Verendrye and his successors from 1737 to 1749
- an Assiniboine camp in 1737
- an unrecorded camp by a European explorer or fur trader
- an unrecorded camp by a Native trader
- an unrecorded seasonal campsite of one of the local Native groups

Future research designs must be cognizant of this potentiality of pre-Gibraltar I habitations. Any project should attempt to integrate analyses of riverine flooding sequences with the above list of possible occupations.

9.0 ADMINISTRATION

9.1 1991 Project Development

In 1989, the administrative bodies consisted of a senior Policy Coordinating Committee comprised of senior representatives from the three funding agencies (Canadian Parks Service, Forks Renewal Corporation, Historic Resources Branch), and a Site Coordinating Committee made up of operational personnel from the above mentioned agencies with representation from the Manitoba Archaeological Society (Kroker, Goundry *et al.* 1990:6–7). Based upon the extremely positive results of the 1989 Pilot Public Archaeology Project, the administrative group planned a similar program for 1990.

The 1990 Operations Committee fulfilled the same role as the 1989 Site Coordinating Committee and consisted of Paul Melanson (Interim Board), Leo Pettipas (HRB), Ellen Lee (CPS), Al Baronas (FRC), Linda Seyers (Manitoba Archaeological Society) and Sid Kroker (1989 Project Director). During February and March 1990, the Operations Committee developed a proposed program and projected budget for submission to the three primary funding agencies. The proposed program was a modified version of the 1989 proposal (Kroker, Goundry *et al.* 1990:Appendix A). During the development of the proposal, the recommendations from the 1989 project (Kroker, Goundry *et al.* 1990:34–36) were adopted and the fiscal ramifications determined. The budget recommended by the committee envisioned a 16-week field program: twelve weeks of general public programming, two weeks for school programming, two weeks for set-up and take-down of the site. Subsequent post-field season research, analysis and publication costs, up to May 1991, were included.

During 1990, public meetings (March and October) resulted in the formation of a community-based, non-profit association to take charge of the delivery of public archaeology programs at The Forks. The October meeting saw the election of a Founding Board of Directors for The Forks Public Archaeological Association (FPAA). An Operations Committee was struck to develop plans for the 1991 project.

In consultation with the 1990 Project Director and administrative personnel of the three primary funding agencies, a proposal and budget for the 1991 project were developed and submitted to the Board of Directors for approval. Based upon confirmed funding, the proposal consisted of a ten-week public project, including 13 days of school programming. The proposal, as in the previous years, included set-up, field season, and tear-down with the attendant post-season analysis and report writing components. After approval was granted by the Board, the necessary administrative arrangements were devised. The FPAA contracted Quaternary Consultants Ltd. (QCL) to deliver the program, with Sid Kroker as Project Director. Lateral contracts between QCL and Canadian Parks Service and between QCL and The Forks Renewal Corporation were executed. Under these contracts, QCL administered the funds from CPS and FRC, while FPAA administered the grant from HRB, upon which QCL would draw under an invoicing arrangement.

9.2 1991 Project Funding

The project was funded by three agencies: Canadian Parks Service, The Forks Renewal Corporation, and Historic Resources Branch of Manitoba Culture, Heritage and Citizenship. In addition to monetary contributions, each agency contributed assistance in supplies and services (Table 22). At the completion of the field component of the project, artifact analysis was undertaken at facilities generously provided by the Manitoba Museum of Man and Nature.

AGENCY	MONETARY	OTHER
Canadian Parks Service	40,000.00	Supplies, Services
Forks Renewal Corporation	45,000.00	Services
Historic Resources Branch	37,500.00	Services
Manitoba Museum of Man & Nature		Lab Facilities
Manitoba Archaeological Society		Kiosk Supplies
Quaternary Consultants		Office Facilities
Registration Fees/Kiosk	6,187.05	
TOTAL	128,687.05	

Table 22: 1991 Financial Support

In addition to contributions by the funding agencies, the project levied a moderate participant registration fee of $12 for the first day and $6 for subsequent days. The fee was levied to cover a portion of the operating costs and to demonstrate to funding agencies that there was a movement towards fiscal self-sufficiency. The fee was collected on-site by the Coordinator when the participants arrived for their allocated days.

The fiscal administration of the 1991 project was similar to that of the previous years (Kroker, Goundry *et al.* 1990, Kroker *et al.* 1991). Quaternary Consultants Ltd. (QCL) was the contracting agency and handled all disbursements. Invoices for expenditures on salaries, capital expenses, reimbursable expenses, and secondment fees were directed to the appropriate agencies.

A finalized budget statement will be provided to the three funding agencies at the completion of the project fiscal operation. To date, expenditures are on target with anticipated costs as developed during the operational budget.

9.3 Project Staffing

The Project Team consisted of eleven people. The personnel and their positions are delineated in Table 23. The Project Director (Sid Kroker), a consultant archaeologist with Quaternary Consultants Ltd (QCL), was retained as the Site Archaeologist by The Forks Renewal Corporation. The Forks Renewal Corporation seconded Sid Kroker to act as the Project Director. The staff positions were funded from the monetary contributions of the three agencies (CPS, FRC, HRB). Some staff changes occurred during the field season. Individuals denoted with an asterisk left the position and were replaced by the following person.

Director:	Sid Kroker
Field Supervisor:	Barry Greco
Laboratory Supervisor:	Sharon Thomson*
	Kate Peach
Field Assistant:	Eric Simonds*
	Laura MacLean
	Lori Dueck
	Lee-Anna Smith
	Catherine Flynn
Lab Assistant:	Kate Peach*
	Shannon Coyston
Participant Coordinator:	Paul Speidel
Site Interpreter:	Gilbert Chartrand
	Darrin Stevenson

Table 23: Staff Positions and Incumbents

The duties of each of the staff positions are detailed below. Implicit in these descriptions is the requirement for professional ability, public interaction, and educational skills.

Director
responsible for overall administration of the project, including budget administration, liaison with funding and regulatory agencies and the media.

Coordinator
responsible for booking and scheduling all individuals and groups who wished to participate.

Field Supervisor
responsible for all aspects of the excavation component—supervision of excavation personnel and participants; excavation procedures; maintenance of field records, etc.; preparation of final report.

Laboratory Supervisor
responsible for all aspects of the laboratory component—supervision of laboratory personnel and participants; artifact preparation and identification; computer cataloguing; maintenance of field records, etc.; preparation of final report.

Field Assistants (4)
responsible for day-to-day supervision and instruction of participants; maintenance of field records.

Laboratory Assistant
responsible for day-to-day supervision of participants; artifact preparation and identification; computer cataloguing.

Site Interpreters (2)
responsible for providing information about the project and the discoveries to the general public

The 1991 Public Archaeology Program has had differing degrees of staff involvement over the course of the project. The staff began at staggered intervals and were employed for different periods. The Project Director has been involved from initial planning (February 1991), through the entire project, to the publication of this report. Other staff members have been involved for shorter durations. The Participant Coordinator began his duties two weeks before the public programming was initiated on July 11. The Field and Laboratory Supervisors began to organize their components on July 2 and the other staff members started to set up the operation on July 4 (one week before the public program). Most positions were terminated at the end of the field season (September 30). The Field and Laboratory Supervisors continued during the preparation of this report. Pamela Goundry and Leigh Hambly provided editorial advice. In addition, Leigh Hambly produced the report in a desktop publishing format.

9.4 Kiosk Operations

The Kiosk was housed in one of the three trailers at the site and was operated by the Coordinator, in conjunction with his other duties. The Kiosk was considered a separate entity with its own budget, even though it functioned as an ancillary component of the 1991 Public Archaeology Project.

In 1989, the Kiosk was primarily an information centre with limited opportunity for volunteers and public visitors to purchase publications and T-shirts. The day-to-day operations were undertaken by the Data Management Officer along with his other duties. The administration of the 1990 venture was undertaken by the Manitoba Archaeological Society, through the MAS Kiosk Committee.

During 1991, the Kiosk operated as the project information centre as well as a retail outlet. Distributional material, relating to the project and other archaeological opportunities, was available for the public. A portion of the display space in the Kiosk area was used by the Manitoba Archaeological Society.

Within the retail aspect of operations, the Kiosk sold various publications and project-related souvenirs. The publications consisted of titles published by The Forks Public Archaeological Association, Manitoba Archaeological Society, and The Forks Renewal Corporation. The souvenirs consisted of specially imprinted items: caps, buttons, and T-shirts. These materials had been provided for sale by The Forks Public Archaeological Association, Manitoba Archaeological Society, and The Forks Renewal Corporation.

Final accounting of the Kiosk component has been completed. Gross income was $1237.50. Debits consisted of $570.67 for returns to vendors, resulting in a net return of $666.83. The 1991 gross income was considerably reduced from that of 1990, due to the decision to return to the 1989 format wherein the Kiosk was operated by a staff member. Thus, retail opportunities occurred only when the Coordinator's presence was not required on his primary duties.

9.5 Public Involvement

The public component of the project was designed to accommodate all degrees of interest, as well as to provide experience for students within the Social Sciences curriculum.

9.5.1 Participants

As soon as announcements were made that individuals could register to participate in the 1991 Public Archaeology Program, intense public interest was evident. A high percentage of the registrations for the entire summer were made during the first few days. The booking procedure was the same as in 1989 and 1990. Individuals registered for their selected days by telephoning the Coordinator. During the field season, on-site registration also occurred. Confirming letters, with project information, were sent to all registrants.

Participation by the general public was limited to three days per participant in order to accommodate as many people as possible. Members of The Forks Public Archaeological Association were entitled to register for five days. During the summer, 219 individuals (Appendix C) worked with the professional staff at the project. Some people booked their days as a block, while others spread their participation out over the summer in order to experience the evolution of a dig.

9.5.2 School Programming

As in the previous two years, the 1991 project could not meet the expressed interest of the school system. Thirteen days in September were allocated for hands-on educational programming for students in the elementary grades. During these days, provisions were made for twice daily in-depth lecture programs. Both components were immediately over-subscribed, creating an extensive waiting list.

The hands-on program was identical to that offered to the general public participants. School class sizes were limited to 30 students, although some variation was acceptable. The classes were divided into three groups. Each group of students received a period of hands-on instruction in the excavation area, an equivalent period participating in laboratory activities and a historical lecture tour of the National Historic Site. The lecture tour was undertaken by the Coordinator. On two days, Gordon Hill, an archaeologist with Historic Resources Branch, provided demonstrations of stone tool manufacture.

During the summer, the University of Manitoba Mini-U Program, booked two days of the program for their participants. In addition, the Young Archaeologists Club booked two days during August.

The 13 days of hands-on school programming were filled by 12 schools (Appendix C) and involved 353 students of Grades 4 through 8. Twenty-one schools (Appendix C), encompassing 782 students, received the in-depth lecture program.

9.5.3 Public Observatory Component

The Public Archaeology Program attracted thousands of visitors. During the course of the summer operations, 15,351 people came to observe the project. These individuals watched the progress of the staff and participant excavators, obtained the most recent information from the site interpreters, collected the brochures about the project (available in English, French, Cree, and Saulteaux), and visited the lab to examine the artifacts that were being processed and view the displays. Many signed the Guest Book located on the viewing platform at the excavation area. They also visited the Kiosk to view the current displays, purchase publications or souvenir items, or just chat with the staff.

The number of visitors was considerably diminished from the peak visitations of 1989 and 1990 (41,439 and 42,480 respectively). There seem to be several reasons for this lessened attendance, which is still greater than the original forecast made during the proposal stage in 1989. First, the number of visitors to The Forks National Historic Site was less, perhaps reflecting the current economic situation. Second, the riverside walkway connecting the Amphitheatre in the Historic Site with the Assiniboine Riverfront Quay and the north bank of the Assiniboine River past Bonnycastle Park had been completed. Many individuals did not utilize the inland portions of The National Historic Site and, accordingly, did not pass by, or were unaware of, the archaeology project. Increased signage may be necessary to rectify this situation. Third, no major activities occurred adjacent to the site during the summer, as had happened in 1990 when the Western Canada Summer Games ceremonies were nearby.

LOCALITY	INDIVIDUAL	FAMILIES
Winnipeg	811	51
Other: St. Vital Parks & Rec. Prov. Employees Day Care Rise & Shine Day Care South Park Child Care YMCA/YWCA Day Care Little Scholar Kollege Care-A-Lot Day Care Kildonan Park Envir Group		
Rural Manitoba (Appendix D)	195	19
Provinces and Territories		
Alberta	78	12
British Columbia	102	3
New Brunswick	6	1
Newfoundland	3	
Nova Scotia	5	
North West Territories	4	
Ontario	220	17
Quebec	31	1
Saskatchewan	49	3
Yukon		1
TOTAL	1504	108

Table 24: Canadian Visitors Who Signed the Guest Book, 1991

The number of Canadian visitors (Table 24) is reduced by nearly 50% from that recorded in 1990. The decrease is approximately the same for all places of origin, including Winnipeg and other Manitoba locations. A similar diminution was noticed in the total number of visitors to The Forks National Historic Site.

LOCALITY	INDIVIDUALS	FAMILIES
Alabama	2	
Arizona		1
California	13	1
Connecticut	2	1
Florida	7	
Hawaii		1
Illinois	2	
Indiana	4	
Iowa	1	1
Kansas	3	
Louisiana	3	
Maryland		1
Massachusetts	2	
Michigan	1	
Minnesota	26	4
Mississippi	1	
Missouri	3	
Nevada	2	
New Hampshire	2	
New York	2	
North Dakota	19	2
Ohio	4	
Oklahoma	3	
Pennsylvania	2	
Rhode Island		1
South Dakota	1	
Tennessee	1	
Texas	4	
Washington	2	
Washington, D.C.	1	
Wisconsin		1
Unspecified State	1	
TOTAL	114	14

Table 25: American Visitors Who Signed the Guest Book, 1991

The numbers of American visitors (Table 25) were down 46% from 1990—114 compared to 211. The number of represented states remained nearly constant (32 in 1989; 33 in 1990; 31 in 1991).

LOCALITY	INDIVIDUALS	FAMILIES
Australia	5	
Austria	1	
Belgium		1
Bermuda	1	
Brazil	4	
Corsica (France)	1	
Curaçao	1	
Denmark	1	
El Salvador	2	
England	28	
Finland	2	
France	6	
Germany	22	
Greece	1	
Haiti	2	
Holland	6	
Hong Kong	1	
Ireland	4	
Italy	2	
Jamaica	1	
Japan	2	
Malaysia	2	
Marshall Islands	1	
Mexico	2	
Norway	2	
Pakistan	1	
Paraguay	1	
Portugal	2	
Scotland	11	
Sweden	5	
Switzerland	1	
Wales	5	
West Indies	1	
TOTAL	127	1

Table 26: International Visitors Who Signed the Guest Book, 1991

The number of international visitors (Table 26) decreased by 47% from the total recorded during 1990. In 1989, 175 individuals from 32 countries signed the Guest Book. In 1990, 239 individuals and five families from 42 countries visited the project. In 1991, 34 countries were represented by 127 individuals and one family.

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APPENDIX A
Glossary

GLOSSARY

acceptance mark
a stamped mark denoting acceptance at the French armouries of Maubeuge and St. Etienne. The different 'crowned R' marks may denote different armouries.

Altithermal
a warm, dry climatic period (7000 to 4000 years ago). Also known as *Hypsithermal.*

Archaic
an archaeological time period referring to Native history prior to the introduction of ceramic manufacture (7000 to 2000 years ago).

arsenal mark
a mark denoting the manufacturer.

Blackduck
an archaeological term which refers to a specific type of Native ceramics decorated with cord-wrapped object impressions before firing. By extension, the term also refers to the people who made this pottery (ca 1400 to 500 years ago).

bourgeois
chief trader and administrator of a North West Company trading post. Equivalent to the factor in the Hudson's Bay Company system.

Cornaline d'Aleppo
A term applied to drawn beads composed of two layers of glass. The inner core is a different colour than the outer layer. Examples are red on white and red on green.

cryoturbic
referring to the process wherein objects, such as pebbles and artifacts, are moved upward in soils due to freezing and thawing cycles.

cup bottom mold
used in blowing glass bottles into a mold in which the separate base portion of the mold is shaped like a shallow cup. There is a horizontal mold seam above the base and vertical body seams join the horizontal seem. Used from ca 1825 to present.

drawn nail
nails made by this method are cut from a length of drawn or extruded wire. Also known as *wire-cut.*

feature
a portion of an archaeological site which shows evidence of human activity, such as a hearth or remnants of a building foundation.

the flats
with reference to The Forks, a colloquial term used prior to 1900 which referred to the low-lying west bank of the Red River, immediately north of The Forks. The site of the *Shanty Town.*

hand-wrought
an adjective describing metal artifacts which have been individually made by a blacksmith, using a hammer and anvil.

Hard Rubber
rubber which has been hardened by vulcanization. The process was invented by Charles Goodyear in 1844 and improved by his brother Nelson in 1851. Buttons were made from this material during the 19th century. Also known as *India Rubber.*

Hypsithermal
see Altithermal

Immigration Sheds
buildings constructed in 1872 at The Forks as temporary housing for immigrant families. Demolished in 1885.

in situ
Latin phrase meaning "in place." Refers to an artifact found in its original position.

kaolin
a fine white clay, found in China, used for making porcelain. Also, a general term which refers to the white ball clay used to make smoking pipes.

King's mark
indicates use and/or acceptance by government troops and armies. Similar to the English broad arrow found on Brown Bess guns.

Laurel
an archaeological term which refers to a specific type of Native ceramics. Decorative patterns include punctates, dentates and incisions. By extension, the term also refers to the people who made this pottery (ca 2100 to 900 years ago).

lot
minimum unit of excavation within a *sub-operation*. May be applied to soil layers, artifact clusters, individual artifacts or samples.

mamelon
a domed, circular protuberance found in the tip of the push-up.

mold cast shot
made by pouring molten lead into a mold, which consists of a spherical cavity between two opposing metal plates, held together by a plier-like arrangement. Shot may also be cast in a multi-cavity, gang mold. Cast shot displays mold seams as well as cut marks where it has been sheared from the mold.

operation
Canadian Parks Service designator for culturally significant areas within a site.

post-bottom mold
used in blowing glass bottles into a mold in which there is a raised area centred in the bottom part of the bottle mold which forms all or part of the bottle base." (Jones and Sullivan 1985: 45). There is a mold seam on the base surrounding the shallow indentation of the post.

Ricketts-type mold
used in blowing glass bottles into a mold in which consists of three parts: a hollow container, often cylindrical, for forming the body; and two matching halves for shaping the shoulder or shoulder/neck portion. The mold seams occur horizontally at the body/shoulder junction and vertically over the shoulder on opposite sides of the bottle. Generally used from 1820 to 1920.

Rupert shot
a technique introduced in 1665 where lead, fluxed with arsenic, is heated in a sieve-like container. Droplets of molten lead fall through the holes into cold water approximately ten inches below. Rupert shot is ovoid in cross-section with a small dimple on the more flattened side.

sand-struck
term applied to soft-mud bricks produced in molds using sand as a lubricant.

Selkirk
an archaeological term which refers to a specific type of Native ceramics, decorated only with punctates. By extension, the term also refers to the people who made this pottery (ca 1000 to 300 years ago).

Shanty Town
colloquial term referring to the temporary houses built on *the flats* (1875–1884).

sheet-cut
a technique of nail manufacture introduced about 1885. Tapered shanks were cut from a sheet of rolled iron and heads added individually.

sub-operation
CPS term used to designate excavation units, e.g., 58K, 52A, etc.

tang
a projecting shank (of a knife, etc.) designed to fit into a handle.

transfer print
popular form of porcelain decoration introduced in the 18th century and still in use today. The technique involves the transfer of a design from an etched and inked metal plate to paper and then to the object. Although many colours were used, blue was the most common prior to the 20th century.

unit
individual excavation area within a site grid—equal to *sub-operation.*

wire-cut nail
see *drawn nail*

APPENDIX B
Scientific Taxonomy

Scientific And Common Names of Recovered Flora and Fauna*

ANIMALS	
Mammal	***Mammalia***
Rodents	*Rodentia*
Beaver	*Castor canadensis*
Rats and Mice family	*Muridae*
Muskrat	*Ondatra zibethicus*
Squirrel family	*Sciuridae*
Rabbits	*Lagomorpha*
Rabbit/Hare family	*Leporidae*
Jack rabbit	*Lepus* sp.
Cottontail	*Sylvilagus* sp.
Carnivore	*Carnivora*
Wolf/Dog/Fox family	*Canidae*
Dog	*Canis familiaris*
Wolf	*Canis lupus*
Coyote	*Canis latrans*
Fox	*Vulpes* sp.
Bear family	*Ursidae*
Bear	*Ursus americanus*
Weasel family	*Mustelidae*
Skunk	*Mephitis mephitis*
Mink	*Mustela vison*
Badger	*Taxidea taxus*
Cat family	*Felidae*
Lynx/Bobcat	*Lynx* sp.
Single-hooved Animals	*Perissodactyla*
Horse	*Equus caballus*
Cloven-hooved Animals	*Artiodactyla*
Cow/Bison/Moose/Elk group	*Artiodactyla* (large)
Pig/Sheep/Goat group	*Artiodactyla* (small)
Deer family	*Cervidae*
Moose	*Alces alces*
Elk	*Cervus cervus*
Deer	*Odocoileus* sp.
Cow/Bison family	*Bovidae*
Cow	*Bos taurus*
Bison	*Bison bison*
Sheep/Goat	*Ovis aries/Capra hircus*
Pig family	*Suidae*
Pig	*Sus scrofa*

Bird	***Aves***
Hawk/Eagle family	*Accipitridae*
Bald Eagle	*Haliaeetus leucocephalus*
Hawk	*Buteo* sp.
Duck/Goose/Swan family	*Anatidae*
Trumpeter Swan	*Olor buccinator*
Goose sub-family	*Anserinae*
Goose	*Branta* sp.
Duck sub-family	*Anatinae*
Duck	*Anas* sp.
Mallard	*Anas platyrhynchos*
Pintail	*Anas acuta*
Scaup	*Aythya* sp.
Merganser sub-family	*Merginae*
Crow/Raven family	*Corvidae*
Crow	*Corvus brachyrhynchos*
Grouse/Partridge	*Galliformes*
Shorebirds/Wading birds	*Charadriiformes*
Perching birds	*Passeriformes*
Fish	
Sturgeon	*Acipenser fulvescens*
Freshwater Drum	*Aplodinotus grunniens*
Catfish/Bullhead	*Ictalurus* sp.
Walleye/Sauger	*Stiziostedion* sp.
Mooneye/Goldeye	*Hiodon* sp.
Pike	*Esox lucius*
Burbot	*Lota lota*
Perch	*Perca* sp.
Sucker family	*Catostomidae*
Amphibian	
Frog/Toad	*Anura*
Reptile	***Reptilia***
Turtle	*Chelonia*
Snake family	*Colubridae*
Gastropod (Snail)	***Gastropoda***
Flat Snail (Ramshorn)	*Planorbidae*
Spiral Snail	*Lymnaeidae*
Shellfish	***Pelecypoda***
Money Cowrie	*Monetaria moneta*
Northern Quahog	*Mercenaria mercenaria*
Freshwater Clam	*Unionidae*
Fat Mucket	*Lampsilis radiata*
Pink Heel-splitter	*Proptera alata*
Pig-Toe	*Fusconaia flava*
Fingernail/Pea Clam	*Sphaeriidae*

PLANTS

Grass family	*Gramineae*
Willow family	*Salicaceae*
Sandbar Willow	*Salix interior*
Peach-leaved Willow	*Salix amygdaloides*
Poplar	*Populus* sp.
Black Poplar	*Populus balsamifera*
Cottonwood	*Populus deltoides*
Trembling Aspen	*Populus tremuloides*
Birch family	*Betulaceae*
Hazelnut	*Corylus* sp.
American Hazelnut	*Corylus americana*
Beech family	*Fagaceae*
Bur Oak	*Quercus macrocarpa*
Elm family	*Ulmaceae*
American Elm	*Ulmus americana*
Nettle family	*Urticaceae*
Stinging Nettle	*Urtica dioica*
Buckwheat family	*Polygonaceae*
Smartweed	*Polygonum lapathifolium*
Goosefoot family	*Chenopodiaceae*
Goosefoot	*Chenopodium* sp.
Rose family	*Rosaceae*
Cinquefoil	*Potentilla* sp.
Wild Plum	*Prunus americana*
Pin Cherry	*Prunus pensylvanica*
Raspberry	*Rubus* sp.
Hawthorn	*Crataegus* sp.
Pea family	*Leguminosae*
Vetch	*Vicia* sp.
Tufted Vetch	*Vicia cracca*
Maple family	*Aceraceae*
Manitoba Maple	*Acer negundo*
Linden family	*Tiliaceae*
Basswood	*Tilia americana*
Olive family	*Oleaceae*
Ash	*Fraxinus* sp.
Black Ash	*Fraxinus nigra*
Green Ash	*Fraxinus pennsylvanica*
Morning-glory family	*Convolvulaceae*
Bindweed (Wild Morning-glory)	*Convolvulus sepium*
Daisy family	*Compositae*
Sunflower	*Helianthus* sp.

*Taxonomy based upon Banfield (1974), Clarke (1981), Godfrey (1966), Looman and Best (1979), and Scott and Crossman (1973).

** The above taxonomic list is a compilation of identified flora and fauna from all three years—1989, 1990, and 1991.

APPENDIX C
List of Participants and Schools

INDIVIDUALS

Heather Adamson
Nesta Becker
Michael Becker
Helen Beeston
Shelly Bergen
Danielle Blais
Daniel Boissonneault
Joel Boissonneault
Christine Braun
Dorothy Braun
Todd Braun
Gloria Briant
Janna Brown
Linda Brown
Moira Brown
Patrick Brown
Laurel Buckels
Betty Campbell
Brad Campbell
Derrick Campbell
Carla Chapman
Allison Chernoff
Agnes Champagne
Kelly Chisholm
Benji Cohen
Callie Cormack
Gilles Crevier
Jeff Crozier
Mark Currie
Andreas Dajic
Mirko Dajic
Cassandra Deane
Lynn Desilets
Lucille Desrosiers
Brian Doerksen
Tom Dorey
Betty Dougall
Taryn Dufault
Vera Dufault
Marie-Christine Eldridge
Michelle Eldridge
Lorna Mae Feilberg
Suzanne Gareau
Gideon Garland
Marshall Garland
Matthew Garland
Tom Garrett
Michelle Gilbert
Ruth Glinter
Jason Gren
Ryan Gren
Benjamin Gross
Issac Gross
John Gunn
Adell Hay
Graeme Hay
Paul Helewa
Ramzie Helewa
Lorraine Hercus
David Herfst
Leanne Hildebrand
Ingrid Hillman
Livia Hillman
Dylan Hoemsen
Ray Hoemsen
Travis Hoemsen
Douglas Holmes
James Holmes
Steven Hunnie
Kevin Jaworski
Sarah Kalcsics
Rose Kamchen-Oakes
Ilana Kogen
Shira Kogen
Denise Kolesar
Karen Lawlor
Alex Lawlor-Guérin
Kevin Lawson
Leanne Leblanc
Brian Lennox
Peter Lennox
Nick Lysecki
Margret MacKay
Pat MacRae
Angela Malchuk
Michael Malchuk
Nadia Malchuk
Dawna Marynuk
Don Masella
Eryn Massey

Leslie Massey
Linda Matheson
Chris McDowell
Jessica McDowell
Shannon McGregor
Paul Melanson
Ian Michel
Marta Michel
Aaron Nelson
Rebecca Nelson
Becky Nemetchuk
Karla Nemetchek
Kristin Nemetchek
Kelly Nestruck
Shane Nestruck
Stacey Nestruck
Susan Noblet
Daniel Oakes
Darren Officer
Joanne Olchowecki
Karen Pedersen
Lauren Pederson
Richard Pook
Matthew Powell
Adora Provinciano
Jane Provinciano
Barbara-Ann Puloski
Darryl Reilly
Andrew Reimer
Carlton Reimer
Maria Reimer
Pat Richl
Dave Russell
Wendy Russell
Andrea Schaffer
Allison Scholl
Nadine Scholl
Jessy Searle
Trevor Selymes
Betty Shale
Michael Shale
Diane Simister
Heather Simister
Ian Simister
Craig Simpson
Andrea Smith
Heather Sorko
Mary Steinhoff
Michael Stercl
Shelly Stewart
Val Stewart
Margaret Sucharov
Elaine Szymanski
Karen Tennenhouse
Ken Tennenhouse
Steven Terrick
Keely Timko
David Timms
Jennifer Watkins
Melanie Watkins
Sonia Watkins
Amy Wiebe
William Wiebe
J.A. "Sandy" Wilson
Michelle Wilson
Karen Zaplachinski
Janet Zebrinski

SCHOOLS AND GROUPS PARTICIPATING IN THE HANDS-ON PROGRAM

SCHOOL	GRADE	STUDENTS	TEACHER
Centennial School (Selkirk)	5/6	31	Bruce MacLaren
Dugald School	6	21	Nicolle Trudeau
Glen Elm School	6	26	Kim Gowryluk
H. S. Paul School	6	40	Bill Zuk
Jefferson Junior High	8	35	Lucy Bauer
Lac du Bonnet School	8	41	Russ Reid
Lavalee School	6	23	Murray Golub
Lions Gate Day Care Centre	-	10	Debbie Cowell
Ramah Hebrew School	5	34	Patricia LeClair
Sansome School	8	29	Anne Williams
Young Archaeologists Club	-	10	Leigh Syms
Univ. of Man. (Mini-U)	-	53	Lorraine Iverach
Westdale Junior High	8	24	Sergei Sherman
Westgate Mennonite	8	27	David Schroeder
Whitemouth School	8	22	Ray Steinhoff
TOTAL		**426**	

SCHOOLS AND GROUPS RECEIVING THE IN-DEPTH LECTURE PROGRAM

SCHOOL	GRADE	STUDENTS	TEACHER
Balmoral School	7/8	24	Joan Main
Fort Garry Program Enrich	5	23	Linda Jijian
Frontenac School	8	49	Mrs. Walker
Gordon Bell	8	75	Thomas Cann
H. C. Avery	6	27	Shelley Maslow
Interlake Home School	3/6	26	Bev Huebner
Jefferson Junior High	8	47	Lucy Bauer
Joseph Wolinsky	11	30	Linda Connor
Linden Meadows	8/9	46	Carol Husack
Lord Selkirk Recreation	-	74	Barb Henry
La Verendrye	6	29	Phillipe Le Dorze
Maple Leaf School	3	78	Donna Milne
Munroe School	6	76	Lee Ann Hodge
Royal School	6	20	Phil Saurette
St. Francis Xavier	4/5	69	Sharon Reinsch
St. George School	8	34	Yolanda Hogeveen
St. John Brebeuf	6	27	John Falloon
St. John's High School	8	14	Gary Nix
Victor Mager School	6	20	Marlene Murray
Warren Elementary	8	32	George Koch
Woodlands Elementary	8	16	George Koch
Windsor Park School	6	20	Al Freisen
TOTAL		**856**	

APPENDIX D
Rural Manitoba Visitors

Manitoba Locales—Visitors who signed Guest Book, 1991

Altona	1 Individual
Anola	3 Individuals
Arborg	1 Individual, 1 Family
Austin	1 Individual
Bagot	1 Individual
Belmont	1 Individual
Birtle	1 Individual
Boissevain	1 Individual
Brandon	14 Individuals, 1 Family
Carman	2 Individuals
Carroll	1 Individual
Cooks Creek	1 Individual
Cranberry Portage	1 Individual
Dauphin	2 Individuals, 1 Family
Deloraine	4 Individuals, 1 Family
Dugald	2 Individuals
Elgin	1 Individual, 1 Family
Elkhorn	1 Individual
Falcon Lake	1 Individual
Fannystelle	2 Individuals
Fisher Branch	2 Individuals, 1 Family
Flin Flon	3 Individuals
Gimli	2 Individuals
Gladstone	1 Individual
Glenlea	2 Individuals, 1 Family
Grand Rapids	1 Individual
Grandview	1 Family
Hamiota	7 Individuals
Holland	2 Individuals
Homewood	3 Individuals
Ile Des Chenes	1 Individual
Inwood	1 Individual
Killarney	1 Individual
La Broquerie	1 Individual
Lac Du Bonnet	17 Individuals, 1 Family
Landmark	2 Individuals
La Salle	3 Individuals
Lorette	6 Individuals, 1 Family
Lundar	2 Individuals
Lynn Lake	2 Individuals
Mariapolis	2 Individuals
Matlock	1 Individual
McCreary	2 Individuals
Melita	1 Individual
Miniota	1 Individual

Minnedosa	7 Individuals
Morden	1 Individual
Niverville	3 Individuals
Oakbank	5 Individuals
Oxford House	3 Individuals
Peguis	1 Individual
Pilot Mound	1 Individual
Pinawa	4 Individuals
Plum Coulee	1 Individual
Portage la Prairie	12 Individuals, 2 Families
Rathwell	1 Individual
Richer	2 Individuals
Russell	2 Individuals, 1 Family
St. Alphonse	2 Individuals
St. Francis Xavier	2 Individuals, 1 Family
St. Malo	2 Individuals
Ste. Anne	1 Individual
Sanford	1 Individual
Selkirk	8 Individuals
Souris	1 Family
Springfield Municipality	1 Family
Steinbach	5 Individuals
Stonewall	1 Individual
Strathclair	1 Individual
Swan River	4 Individuals, 1 Family
Teulon	1 Individual, 1 Family
The Pas	1 Individual
Thompson	7 Individuals
Treherne	1 Individual
Tyndall	1 Family
Virden	2 Individuals
Wanipigow	1 Individual
Winkler	4 Individuals