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IN
STORAGE

ARCHAEOLOGICAL EXCAVATIONS AT THE
NORTH WEST COMPANY'S DEPOT
GRAND PORTAGE, MINNESOTA IN 1970-71,
BY THE MINNESOTA HISTORICAL SOCIETY
ALAN R. WOOLWORTH - 1975

CX 1410-2-920-202

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ABSTRACT

This report describes archaeological remains excavated near the Great Hall, Grand Portage National Monument, Minnesota in 1970-71. Little information was found on the Great Hall aside from a porch in front of it. These scanty remains suggest that the building was razed and sound timbers transported by water to Fort William for reuse.

A Kitchen building was found and excavated in the rear of the Great Hall. It measured about 27 by 35 feet. Within it were a stone outlined fireplace and dry well or "Cooler." Porches were found on the north, east, and south perimeters of the building. The ground on which the Kitchen was built was wet in 1785. Drainage was afforded by ditches in the front and rear of the building. The structure was excavated on a 10' grid.

Approximately 14,000 artifacts were found in the Kitchen. Most common were roseheaded nails. Thousands of fragments of creamware and pearlware bowls were recovered. Present also in quantities were broken liquor bottles. There were many personal possessions such as beads, brass tinklers, and kaolin pipe fragments. Cutlery, in the form of steel knives, forks, and pewter spoons was relatively plentiful. A moderate amount of woodworking tools, iron bar stock and building hardware was also found.

Simplistically, these artifacts can be divided into the four major classifications of building hardware and tools; household goods; personal possessions and trade goods; and artifacts of native origin. Generally, these artifacts depict the demolition of the Kitchen building; some of its furnishings; and the cooking, eating, and drinking which went on within it from about 1785 to 1804.

A considerable amount of information on the functional usage of space in this building has been inferred from artifact distributions. The working face of the fireplace was its southern aspect. Leisure moments were spent on the porches surrounding the building or lounging in front of a doorway facing the rear of the Great Hall. A food preparation area was located east of the fireplace. Social activities took place in front of the fireplace.

The age and use of the puzzling "Central Palisade Trench" was resolved. This trench ran from the main gate westward to the western palisade. Available evidence suggests that the trench and its palisade were older than the Kitchen. The Kitchen and the Great Hall appear to have been erected about 1785. At the same time, the palisades were extended northwest, north, and northeast to enclose an additional area of about one acre.

These excavations provided data for a more accurate reconstruction of the Great Hall; the location, dimensions, and many furnishings of the Kitchen structure. Much information was also provided for the interpretation of the life styles at the site during the period ca. 1785-1803.

SECRET

The first part of the document discusses the general situation of the country and the role of the government. It mentions the need for a strong and stable government to ensure the development and progress of the nation. The text emphasizes the importance of maintaining law and order and promoting economic growth.

The second part of the document focuses on the social and cultural aspects of the country. It discusses the role of education in shaping the future of the nation and the importance of preserving the country's cultural heritage. The text also mentions the need for social justice and the elimination of poverty.

The third part of the document deals with the political system and the role of the citizens. It discusses the need for a democratic and participatory government and the importance of the citizens' active involvement in the political process. The text also mentions the need for transparency and accountability in the government's actions.

The fourth part of the document discusses the international relations of the country. It mentions the need for peaceful and cooperative relations with other nations and the importance of maintaining the country's sovereignty and independence. The text also mentions the need for international cooperation in various fields.

The fifth part of the document discusses the economic development of the country. It mentions the need for a strong and diversified economy and the importance of investing in infrastructure and human resources. The text also mentions the need for economic reforms and the promotion of private enterprise.

The sixth part of the document discusses the environmental protection and the sustainable development of the country. It mentions the need for a clean and healthy environment and the importance of conserving natural resources. The text also mentions the need for sustainable development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The seventh part of the document discusses the role of the media and the importance of a free and independent press. It mentions the need for the media to provide accurate and unbiased information to the citizens and to hold the government accountable. The text also mentions the need for the media to promote social justice and the development of the nation.

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MAPS

(In pocket at rear of report)

- Map 1. General Map of Excavations, 1970, Grand Portage National Monument. This map shows the general features explored in 1970 such as the Great Hall, the porch area in front of it, the Kitchen structure, and the two fur trade era drain trenches. Also shown are associated features such as the Well, the Palisade, the Gatehouse and the two modern drains. Drawn by Alan R. Woolworth; drafted by J. W. Oothoudt. (32" x 36"; Scale: 1" = 5')
- Map 2. The Great Hall Excavations, 1970, Grand Portage National Monument. This map depicts the details of the 1970 excavation of the Great Hall and of the area immediately in front of it. Given on it are the concrete Great Hall foundations, the concrete fireplace bases, the piers, the fox run, step footing, the numbered post molds found in front of the Great Hall and the limits of the excavation. Drawn by Alan R. Woolworth; drafted by J. W. Oothoudt. (27" x 36"; Scale: 1-1/2" = 5')
- Map 3. The Kitchen Structure and Associated Features, Grand Portage National Monument, July 1970. This map shows the structural features of the Kitchen building such as the fireplace and the "cooler", important artifact locations, the presumed limits of the building and the Fur Trade Era Drain Trench. Drawn by Alan R. Woolworth; drafted by J. W. Oothoudt. (27" x 37"; Scale: 1" = 2')
- Map 4. The Kitchen Structure and Associated Features, July, 1971, Grand Portage National Monument. This large map was prepared to show the associated features within the Kitchen building and around it at the close of excavations in 1971. It depicts graphically all of the archaeological features found in the 1970-1971 excavations in this portion of the Monument. Drawn by Alan R. Woolworth; drafted by Jerry W. Oothoudt. (39" x 46"; Scale: 1" = 2')

I.

INTRODUCTIONPurpose, Objectives and Presentation

The purpose of this report is to describe the archaeological remains, both structural and artifactual, found during the excavations in and around the location of the Great Hall at the Grand Portage National Monument in 1970 and 1971. These excavations were sponsored by the National Park Service and conducted under contract by the Minnesota Historical Society. Funds were provided by Contract No. 14-10-2:920-202; by supplements to it; and Purchase Order No. 4970L10867.

A summary report on the 1970 excavations was submitted to the National Park Service, Western Service Center on July 28, 1970.

Objectives for excavations at this site were set forth as follows:

1. To excavate the area in and around the site of the Great Hall, in a search for data regarding the location, materials and dimensions of this structure.
2. To excavate the area to the rear of the Great Hall and across the "Central Palisade Trench" in a search for the remains of a large kitchen structure which would have been used to prepare food for tenants of the Great Hall.
3. To date if possible the "Central Palisade Trench" to the rear of the Great Hall.
4. To undertake detailed research on the artifacts recovered during the 1970 field season and to provide further information on possible furnishings for the Great Hall and adjacent Kitchen structure.

All of the foregoing was to be completed by August, 1971 unless the time for completion was extended by the Service.

By the terms of this contract and the purchase order, the Society was committed to provide qualified personnel and facilities to conduct the excavations and to process and study materials and data from these excavations. Provisions were also made for the preparation of a final report on the work and for the ultimate return of all artifacts to the Monument upon completion of the study.

In the present report, the site is described, archaeological field work summarized, structural remains described, and an analysis of the artifacts recovered is presented. Artifact catalogs are included to meet the needs of the National Park Service. Throughout this report, a narrative form of presentation is used. Where possible, conclusions are drawn from the data; and some speculations are made where the data are insufficient for formal conclusions. Efforts have been made to provide as complete a report as possible for interpretive and developmental uses.

The responsibility of carrying out the field work and report preparation fell upon myself and my wife, Nancy Woolworth, who has served as an assistant archaeologist on so many excavations at Grand Portage and who knows much of the history of this location herself and who did the preliminary research on the artifacts.

Institution, Excavators, and Acknowledgements

Heartfelt thanks are due the following staff members of the Minnesota Historical Society who all contributed much of themselves to the preparation of this report. Leslie D. Peterson who cataloged the numerous artifacts from the 1970 field season and who later printed this report; to Jerry W. Oothoudt who drew many of the maps and figures of

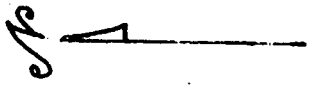
artifacts; Neil D. Saylor who likewise drew and photographed artifacts; Douglas George who cataloged the artifacts from the 1971 field season; Susan Zeik who aided materially in collating data on many kinds of artifacts; Catherine Miller who identified the faunal materials; Brenda M. Lockhart who aided with the ceramics; and Libuse O. Tweedale who patiently typed the report manuscript and who aided in many other ways. Thanks are also due to Superintendent Richard Tousley, Architect Francis Robson and many old friends at Grand Portage who cheerfully did the heavy labor of the field excavations. An extra note of thanks is due to Edward Lofstrom who analyzed the ceramics and the glassware in a professional manner. Cathleen Coppini has diligently redrawn a number of the Text Figures. As ever, the resources of the Minnesota Historical Society were placed at my disposal during the project. Russell W. Fridley, Director, has continued his warm interest and support of the Society's involvement at this complex site. Many others on the Minnesota Historical Society staff have patiently borne up under my chronic interest with the life and lore of Grand Portage.

The Site DescribedLocation and Topography

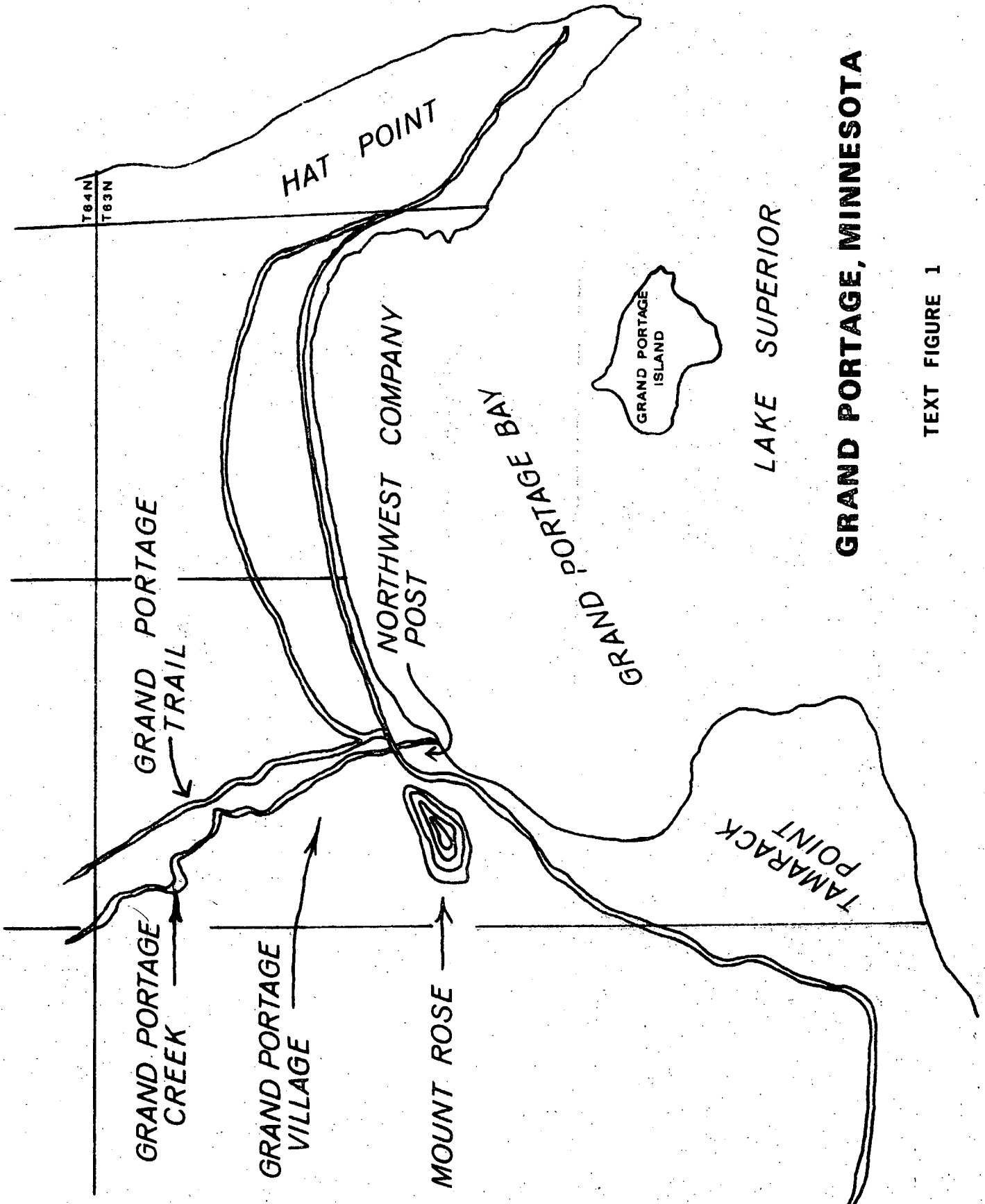
The following data are a condensation of a similar portion of the report on the Society's 1936-37 excavations at Grand Portage. The reconstructed North West Company depot is located in the Southwest 1/4 of Section 4, Township 63 North, Range 6 East, Cook County, extreme northeastern Minnesota. It is a few hundred yards south of the modern community of Grand Portage and fronting immediately on the shore of Lake Superior.

In geographical terms, the site is situated in the western portion of Grand Portage Bay which is one of the finest natural harbors on the northern shore of Lake Superior. The eastern portion of the bay is enclosed by Hat Point, a prominent and elevated peninsula which juts out into the lake. The western border of the bay is shaped by Raspberry or Tamarack Point which rises only about twenty feet above the lake. In the center of the bay and about midway between these two points of land is Grand Portage Island. The arms of the bay and the island act as buffers to prevent high waves from sweeping into shore. Hence, the bay is quite sheltered and not much exposed to severe wave action. The bay is approximately 1-3/4 miles across and more than a mile in depth (Text Figure 1).

The North West Company post is situated in the western portion of the bay. The shoreline in front of it is steep and rocky and about five feet above the lake elevation of 602 feet above sea level. Grand Portage Creek is immediately to the east of the post, and Mount Rose,

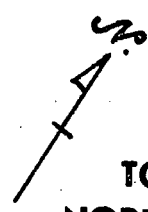


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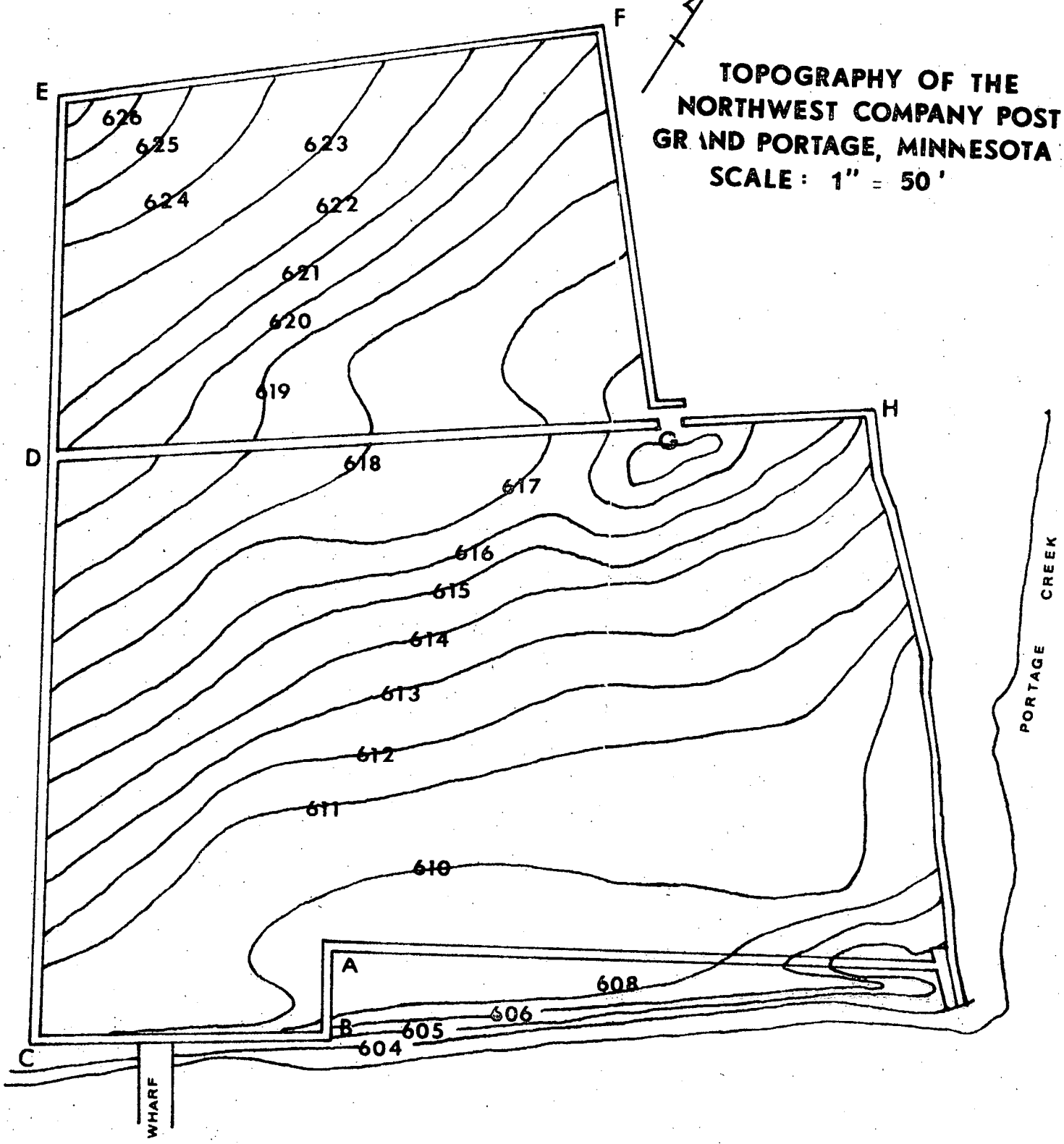


GRAND PORTAGE, MINNESOTA

TEXT FIGURE 1



**TOPOGRAPHY OF THE
NORTHWEST COMPANY POST
GRIND PORTAGE, MINNESOTA
SCALE: 1" = 50'**



TEXT FIGURE 2

a local landmark, rises to a height of about 920 feet above sea level to the rear of the post. The stockaded enclosure has an elevation of 608 feet in its southeastern corner and slopes gradually upward toward Mount Rose to an elevation of 626 feet in its northwestern corner. Most of the stockaded post lies between elevations of 610 to 620 feet above sea level. A relatively prominent glacial beach runs east-west through the center of the southern portion of the enclosure. The reconstructed Great Hall is on this beach which has an elevation of 614 feet (Text Figure 2).

Thus, the land surface slopes upward gently from Lake Superior toward Mount Rose. It breaks off relatively sharply on the western bank of Grand Portage Creek which is only a few feet eastward of the stockade's eastern facade. Surface drainage is reasonably good within the enclosure except for its northeastern portion which lies behind the Great Hall.

A thin mantle of humus mixed with sand and gravel overlies the entire enclosure. The subsoil near the lake is composed of fine beach sands for a distance of about 150 feet northward from the lake shore. A heavy brown clay thereafter extends northward for about 100 feet across the central portion of the enclosure. About 250 feet northwards from the southwest corner of the enclosure is found a layer of slate which is close to the ground surface and extends across most of the northwestern portion of the site. Large subsurface boulders are present over the entire area of the northern portion of the enclosure. The heavy clays and slate which underlie the central and northern sections of the enclosure retain water. Consequently, the northern portion of

the enclosure and the area immediately west of it are marshy in some spots and wet after rains. These geological features had an important bearing on the depot and continue to do so now and will into the future.

The area in the southern portion of the enclosure and immediately to the west of it were occupied intermittently by Indians from about 1840 to 1936. Usage was also made of the region along the west bank of Grand Portage Creek for many years by the local Indian and White populations. Lastly, the section now utilized as a parking lot and immediately north of the enclosure was used for an unknown number of years by the same people.

Historical Sketch Of The Area

The Grand Portage had undoubtedly been used by Indians for centuries prior to the coming of white men to the north shore of Lake Superior. The first known mention of this route dates from 1722 (Margry, 6:516, 1886). La Verendrye landed there in the fall of 1731 and used the Grand Portage Trail, but it is doubtful if the French had an extensive establishment at this location. With the fall of New France in 1760, a new group of traders shortly began to make a more extensive utilization of the site of Grand Portage and the Trail itself.

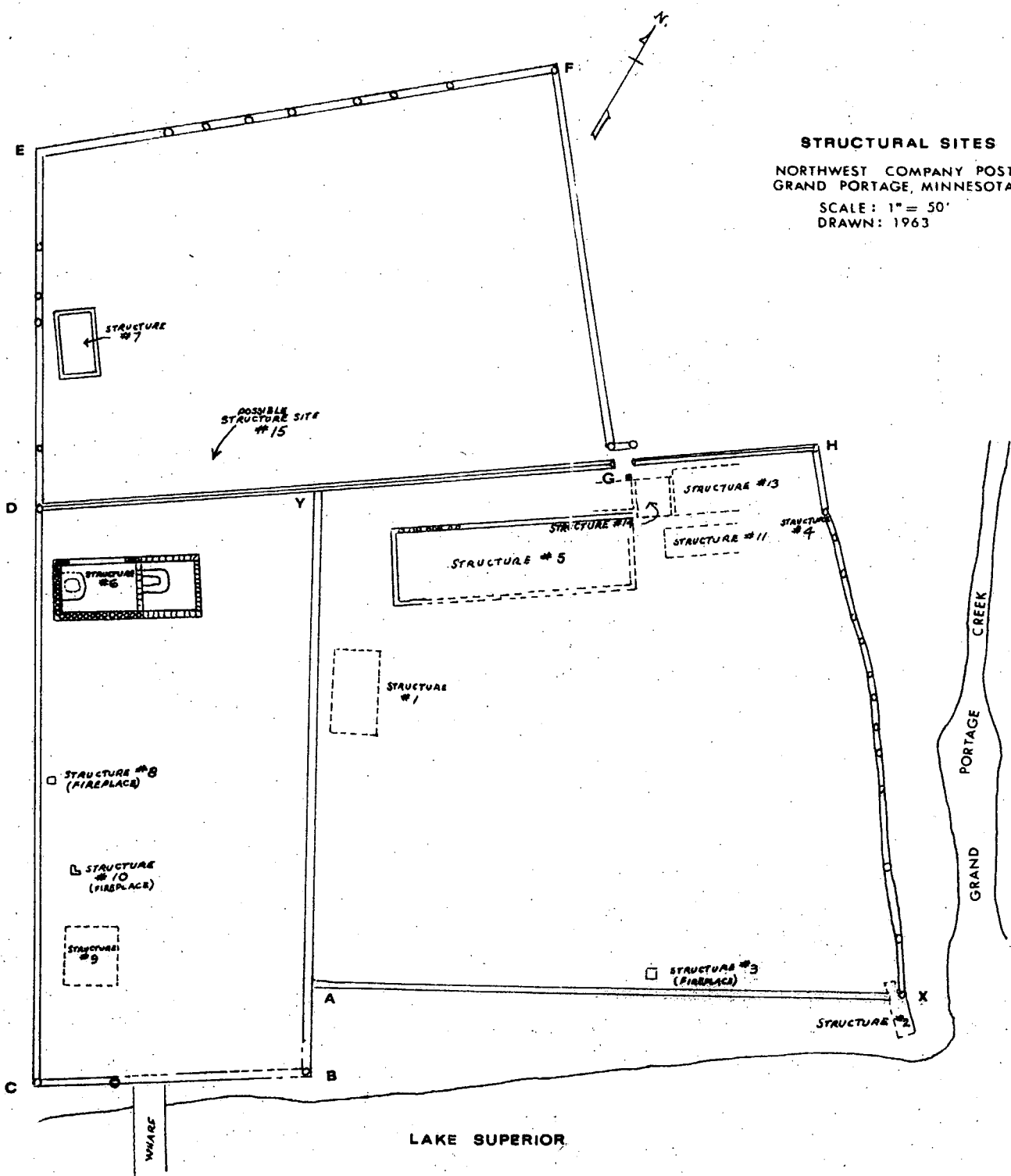
British traders who came here about 1762 remained for many years and soon commenced the development of an extensive fur-trade depot. John Askin is the first trader about whom much is known at this location. In about 1768, he cleared a portion of the site with which we are concerned and erected a few buildings (Nute, 1940, p. 134). By 1778, a merger of competing traders had formed a concern called "The North West Company" and Grand Portage became the great entrepot for a vast

region to the north and west. At about this time, a more elaborate post was commenced at the site. Thereafter, Grand Portage grew in importance up to about 1800. It was abandoned in 1803, when the Northwest Company moved to Fort William on Canadian soil. The structures at this site in 1803 represented the accretion of many years and had most probably been erected by many traders over a span of about 30 years, and in a variety of construction styles (Text Figure 3).

During its heyday, from around 1785 to 1800, Grand Portage was the point at which all furs, all supplies, and hundreds of employees gathered for an annual rendezvous in the month of July. Its function as a depot for outgoing supplies and incoming furs led to a specialization in the functions of buildings at the site. A description dating from 1793 states that the enclosure had three gates in its palisades over which stood two guard houses. Sixteen buildings of slight construction stood within the enclosure. They were made of whip-sawn cedar and spruce boards. Their roofs were covered with cedar and pine shingles. Of these buildings, six were storehouses, one a counting house, one a mess hall, and the remaining eight were dwellings and shops. (Gates, 1933, pp. 92-94). At this time, the palisade pickets were from 15 to 20 paces from the waters of Lake Superior. Another account of Grand Portage dated 1803, mentions that "bastions" stood at the four corners of the stockade (Quaife, War on the Detroit, 1940, pp. 10-12).

By 1822, the palisades along with the numerous structures had vanished and David Thompson found only red clover blooming where they had stood (Nute, Lake Superior, 1944, p. 307).

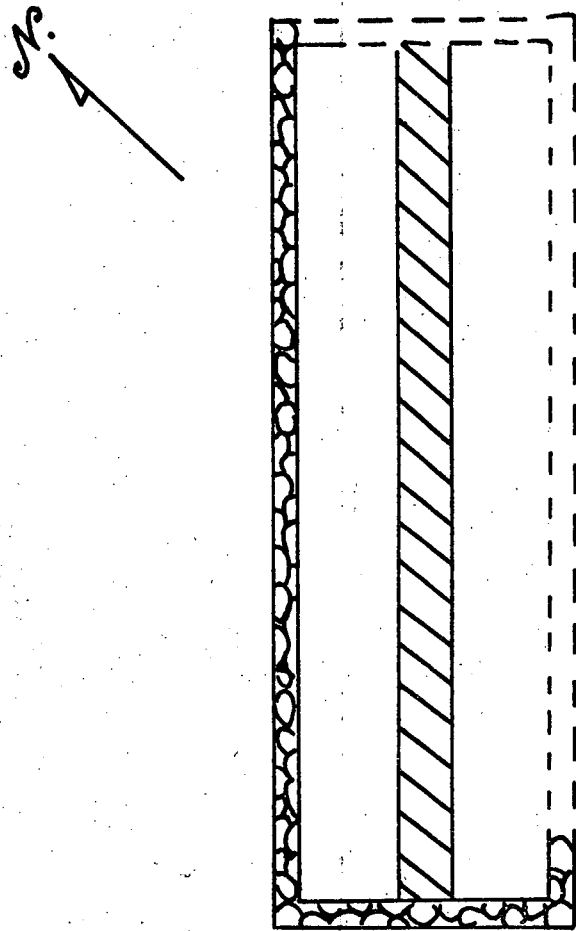
In the mid-1830's the American Fur Company had a fishing station at Grand Portage which may have stood on or near the site of the reconstructed North West Company post, but as yet nothing has been found which would show the location of this probable occupancy of the site (Woolworth, 1963, pp. 4-6, 8-10).



STRUCTURAL SITES
NORTHWEST COMPANY POST
GRAND PORTAGE, MINNESOTA
SCALE: 1" = 50'
DRAWN: 1963

TEXT FIGURE 3

THE GREAT HALL
STRUCTURE NO. 5
1937



SCALE: 1" = 20'
(From: Woolworth, 1963)

TEXT FIGURE 4

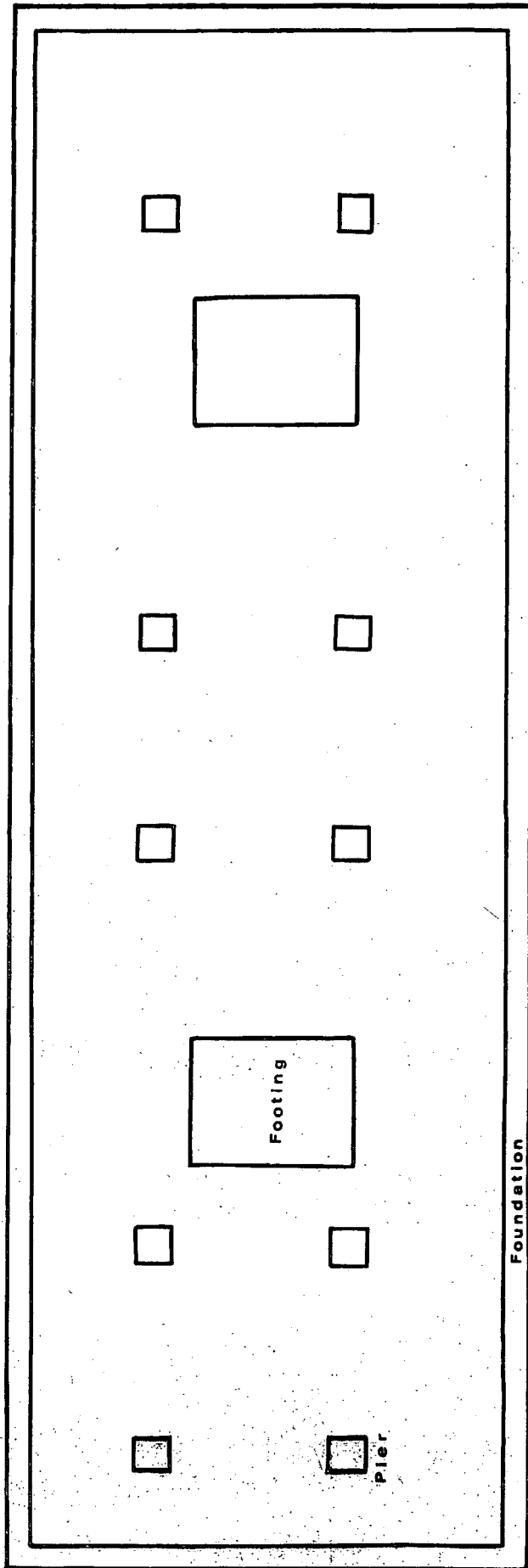
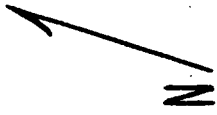
II

ARCHAEOLOGICAL FIELD WORKReconnaissance of the Site in 1969

In September of 1969, Mrs. Woolworth and myself were at Grand Portage for minor archaeological tests. Proximity to the ruins of the Great Hall and conversations with Superintendent Tousley induced us to make a measured drawing of the foundations, piers, and concrete fireplace bases of that structure. In part, this was done to have a record of these features prior to their presumed demolition and in anticipation of field work there in 1970.

Familiarity with the reconstruction of this structure in 1938-40 had led me to assume that the exterior dimensions of the poured foundations would be 30' x 95'. To my great amazement, we found that the exterior dimensions of the concrete foundations were 32' by 96'10". These walls were 18" thick at their bases, and the building plates were inset 1'0" from the outer perimeter of the walls. This gave the reconstructed building a dimension of 30' by slightly less than 95'. It was also rather disappointing to find that these poured foundations had been merely set into trenches dug into the gravel and clay of the site, not onto "step footings." Further, some portions of the walls had cracked to a considerable degree and had been undermined. Additionally, the corners had not been reinforced with reinforcing steel. It must be remembered, however, that this work had been done under standards of an earlier time when funds for materials were scanty, but labor was plentiful (Babcock, 1941, pp. 52-55; Larson, 1946, p.25).

Present within the interior of the foundation were five pairs



TEXT FIGURE 5



FOUNDATION, PIERS AND FIREPLACE FOOTINGS

GREAT HALL, 1970



of matched concrete piers which had once supported stringers under the floor joists. They were 2' by 2'. Their presence was noted as they had been formed over square pits dug into the earth. Conceivably, they could have had an effect upon structural or other remains at the site. Also very noticeable were two massive concrete fireplace footings. One of them was at the eastern end of the enclosure, the other at the western end of it. These measured approximately 7' by 12' and had a considerable elevation as they had once risen to the finished floor level within the Great Hall. Strewn about within this area were large quantities of ashes and some other debris from the fire which had destroyed the Great Hall in July of 1969. A "cleaned up" version of this map is included within the present report as : "Foundation, Piers, and Fireplace Footings" (Text Figure No. 5).

Surveying Methods and Controls

At the start of excavations in 1970, there were no readily available survey points near the Great Hall. The survey points established in 1963 were inaccessible because of the palisades surrounding the enclosure. With this fact in mind and aware of a need for a convenient survey point, a 0-0 point was established in the exact center of the Great Hall foundations by making diagonal measurements across the rectangle. An East-West line running through this point was then laid out. With this as a base line, it was a simple matter to lay out other lines within the enclosure or outside it in the immediate vicinity. Initially, however, our concern lay with the area within the Great Hall foundations. Here, parallel lines

were laid out in an East-West direction from the baseline at 5' intervals. Stakes were set into the earth at 10' intervals along these lines.

No particular efforts were made to establish vertical controls as the area within the foundations was relatively level.

A North-South baseline was next laid out at a right angle to the original baseline. The East-West baseline was extended eastward to a point 50 feet east of the 0-0 point and westward an equal distance. The North-South baseline was extended southward 30 feet to 0 E-W/30S and northward to 0 E-W/80N.

A glance at Map 1 will show that this system encompassed the entire Great Hall and an area south of it which measured approximately 14' wide by 110' long. It will also be noted that the North-South baseline extended perpendicularly through the approximate center of the Kitchen building which was discovered to the rear of the Great Hall. Eventually, the entire kitchen structure was excavated on the basis of this survey.

The entire area was mapped with an alidade and plane table and the usual steel tapes. A Brunton compass was used to establish angles. All measurements were recorded in the English Linear system.

Excavation Techniques in 1970-71

As the area under investigation was level and had a sandy surface, the initial excavations did not create any unusual problems. As a start, the area in front and to the rear of the Great Hall was stripped of sod with a front end loader and scraper blade. This was done however, only after a number of test excavations had established

that the fur trade era artifacts were at a considerably lower level. Once the sod had been removed, the area was leveled up with shovels and examinations made for buried features.

Next, the North-South and East-West baselines were established by setting rows of marked stakes at 10' intervals. Then, the entire area scheduled for excavation was staked out on a grid of squares which measured 10' on a side.

Excavation of individual squares now began with sharp shovels. Soil was removed in three inch levels whenever possible, and any artifacts retrieved were placed in paper bags with the date, square designation and the depth recorded. A close watch was kept for structural evidence and when found, it was carefully uncovered, photographed, and recorded on a map. Notes were made on observed features and feature sheets made out to permanently record them. Efforts were also made to keep stones and large pieces of rotted wood in place so that their nature and relationships with other structural members could be studied. Little was found in the first 3" level at the site, but gradually, artifacts became increasingly numerous. Shovels were then set aside and trowels used to strip away thin layers of soil, and in some instances to profile promising areas, etc. The area containing the Fur Trade Era Drain Trench and the Kitchen Structure was largely exposed by troweling and excavated to a depth of about 1' below the original grade level to sterile soil.

As the excavations proceeded, the upper portions of large numbers of rounded glacial boulders and some segments of the local shale began to appear. Excavations continued in the dark soil which

lay between these stones, and a number of artifacts were found there. The majority of these boulders were from 8" to 12" in diameter. They lay under a mantle of about 9" of soil. The bulk of the artifacts were found in the soil just above these boulders. Only a few randomly distributed artifacts were retrieved at depths greater than 12". Most of the soil between the boulders was sterile. Although the artifact catalog indicates that some artifacts were found at depths of from 9" to 18" below the ground level present in 1970-71, it was only rare specimens which were found at depths below 12".

When the excavation had been completed, an almost solid mantle of glacial boulders lay over the entire area in which the Kitchen structure had stood. The building's center was the highest elevation. It was approximately 12" higher than the mantle of boulders. Thus, the upper surfaces of the stone outlined Fireplace and "Cooler" rose about one foot above these boulders.

History of Excavations in 1970-71

Excavations began on June 15, 1970 after consultations with Superintendent Richard Tousley. A crew of local residents was hired. As an initial step, a sketch map of the foundations which had been made in September, 1969 was checked. Thereafter, many truckloads of debris from the 1969 fire and the 1938-1940 reconstruction were removed. This consisted of broken firebricks, mortar and quantities of stone fragments from the dressing of stone for the fireplaces and chimneys ca. 1938. Approximately 8" of fill was removed during this phase which took about 10 working days.

The area was then leveled off and survey points established. A 0-0 Point was established in the approximate center of the building and a line extended East-West through the long axis of the foundation. This was the base line from which the rest of the season's excavations were conducted.

Frequent consultations were held during this period with Francis Robson, the architect assigned to the reconstruction of the Great Hall, on soil conditions, etc.

A total of five trenches were excavated into sterile soil within the building foundations. As artifacts were found, they were placed in bags by levels and at intervals controlled by the grid stakes. During the course of these excavations, only a very few artifacts of the fur trade era were found. No structural evidence was discovered from an earlier building. A number of modern intrusions such as the remains of a fox pen and a fox run were found however. These remains were mapped, photographed and selected artifacts from them saved. Once these excavations were completed, all trenches, etc. were backfilled and operations shifted to the front of the Great Hall.

In this area, it was necessary to remove the stump of a large spruce tree which had stood in front of the Great Hall. Considerable time was spent in breaking up and hauling off a large concrete and stone step from the southern wall of the building. Considerable modern fill from in front of the exterior face of the southern wall of this building was removed with a front end loader. This stripping revealed the outlines of a woven wire fox run which had crossed this wall in two places. It had been placed into the ground and stones had been used as backfill around the wire to prevent the foxes from digging out of it.

Approximately another foot of earth was removed from this area by hand methods. During this time, a watch was kept for pit outlines, post moulds and artifacts. Large quantities of modern remains such as bottle glass, mason jars, wire nails and stove parts were found.

Finally, the outlines of the fox run and several modern disturbances such as pits had been delimited. By then, we were in sterile beach sands and gravels. After much effort, we succeeded in finding the posts described hereafter and indicated on the enclosed map. Their locations were carefully platted on the area map, and notes were made on all of them. Profiles were made to substantiate each post mould (Map 2).

As a last effort in this area, the excavations were extended outwards on the east and west to try to find post moulds which might have supported steps at each end of a porch, but results were entirely negative.

A total of 15 posts were found in front of the Great Hall; undoubtedly others had once existed but had been destroyed by human activity since its abandonment about 1803. Five of these posts were round with rounded moulds. The other ten had square or rectangular outlines and were obviously dug with a square shovel or spade.

Dr. Paul Schumacher visited the site in late June and early July. On his first visit, he left a request to conduct excavations in an area measuring approximately 50' x 100' in the area north of the Great Hall. On July 2nd, and in view of the short time available, I hired a skilled machine operator and proceeded to strip the sod from this area. Within two hours, this had been accomplished. It would have taken approximately two weeks by hand labor.

Within a short time, we had found unmistakable evidences of a wooden structure which had an elevated fireplace and adjacent to it a "cooler" which was surrounded by large rounded boulders. This building was situated approximately 25' due north of the center of the northern wall of the Great Hall. It measured approximately 35' East-West by 27' North-South. The materials within it were rich and varied. They were mostly rosehead nails, ceramics, tumblers, bottles, brass spigots, animal bones and beads.

The area was then leveled off and a grid of 10' squares superimposed over it. This grid was based on the North-South base line running through the short axis of the Great Hall. Thereafter, trowels were used to excavate for both structural and artifactual remains.

Gradually, large numbers of glacial boulders and pieces of flat, angular shale were uncovered. All stone was left in place until the excavation had been almost completed. Special efforts were made to map the shale slabs as they had been used for structural purposes. Many of them lay around the fireplace and had clearly been a part of it or of the chimney. The entire area was covered by a mantle of rounded glacial boulders. Many artifacts and segments of flooring were found above them. Eventually,

the trowling was completed and the clay was exposed underneath the boulders.

Unfortunately, little structural evidence was uncovered to delimit the building. Building outlines could be approximately determined only by the rotted wooden flooring. Therefore, the building size was as yet only approximate.

The Great Hall building foundations were removed after marking the building corners. No damage was done to the surrounding soil and nothing of interest was noted during this work on the evening of July 22nd. The excavations were completed on July 23rd, 1970.

Excavations were resumed at the site of the kitchen structure on July 9, 1971. Initial efforts were devoted to relaying the 10' grid system and to cleaning out a drainage trench to remove surface water. Thereafter, some time was consumed in trying to repair the damage caused by power equipment which had entered the kitchen site earlier and had destroyed the exposed stone fireplace and cooler. These features had been left open for their interpretive potential. Additional problems had been created by approximately one foot of fill materials which had been deposited over the uncovered glacial boulders in this area.

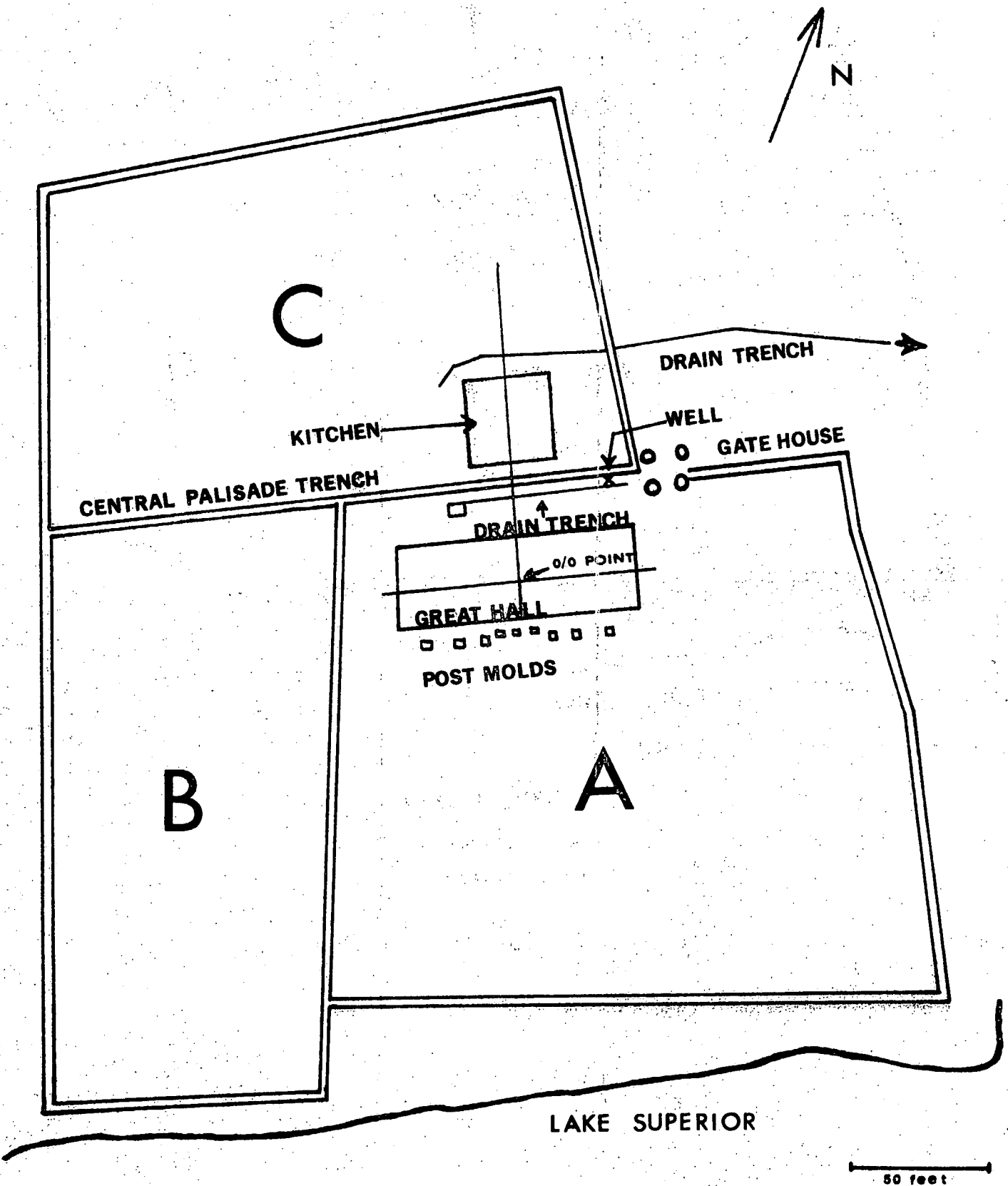
With these tasks completed, our attention shifted to extending the grid system to the west, north and east of the kitchen building. Stripping operations were then commenced which removed the sod and surface debris from these areas. In some instances, traces of red cedar flooring were revealed. A number of locations were also found in which flat slate slabs were either lying flat on the soil or vertical. In other instances, circular areas were found which were surrounded by both slate and rounded stones. It would appear that most of these features were braced post moulds.

In general terms, it was evident that the major portion of the Kitchen

had been excavated in the 1970 field season. We were now working on its periphery in locations where porches and sheds which were in close proximity to the Kitchen had once stood. This undertaking continued up through July 24th.

During the 1970-1971 field seasons, an extensive area enclosed within the coordinates 20 East-30 North to 30 West-30 North and 30 East-90 North to 30 West-90 North had been completely excavated to sterile soil or glacial boulders. It was apparent that all available data concerning the Kitchen and its associated features had been excavated.





TEXT FIGURE 6

MAJOR FEATURES OF THE NORTH WEST COMPANY DEPOT

GRAND PORTAGE, MINNESOTA

THE ARCHAEOLOGY OF THE SITEExcavations On The Interior Of The Great Hall Foundations

As a preliminary step, a sketch map of the concrete foundations which had been made in late 1969 was checked. The National Park Service's maintenance crew had already removed many truck loads of large rubble and debris from the building site. In addition, the concrete piers were removed as were the massive stone fireplaces and their chimneys. This was accomplished by the NPS and a local contractor. Thus, much effort had already gone into cleaning the site prior to the archaeological field work.

It was necessary, however, to level up the land surface within the foundations and to remove obviously modern materials before commencing a serious archaeological excavation. Therefore, many truck loads of small modern materials from the recent demolition of the chimneys, fireplaces and the fire were removed. Following this, rubble from the ca. 1938-40 reconstruction of the Great Hall was found and hauled away. This consisted of broken firebricks, mortar, and stone fragments. Approximately 8" of fill was removed which required about 10 days.

The area inside of the foundations was then leveled off and survey points set up. A 0-0 Point was located in the approximate center of the building and a base line extended in East-West directions through the center of the structure. Parallel lines were then laid out at intervals of 5' to the north and south of the base line. Following this, stakes were set at intervals of 10' along these lines. The 0-0 Point, of course, was the basis for the numerical designations placed on them.

In a number of instances, the extant concrete fireplace bases impeded this staking. (See Map 2 and Figures 1-3).

Trenches 18" in width were then excavated along these lines into sterile soil. Testing was also done around the fireplace bases to learn if they stood on earlier remains. Frequent consultations were held during this period with Francis Robson, the architect assigned to the reconstruction of the Great Hall, concerning soil conditions, etc.

A total of five trenches were excavated lengthwise within the building foundations. These measured 18" in width and approximately 92' in length. These were along the 0-0, 5 North, 10 North, 5 South and 10 South lines. When artifacts were found, they were placed in bags by levels and at intervals designated by the stakes.

A very meager artifact collection was recovered from this area. Discarded in the field were such obvious items as rusted tin cans, soft drink bottles, round wire nails, "square nails" from the reconstruction of the Great Hall, broken bricks, and many souvenir materials which were once sold here. A few of the more interesting items are illustrated in Figure 29. In the main, they are from the late 19th and early 20th centuries.

The trenches within the Great Hall foundations were excavated with difficulty because of the presence of a large number of glacially deposited boulders. This portion of the enclosure lies on an old beach ridge. A typical soil profile in this area is as follows: 9" fine yellow sand, 2" small pebbles, 4" brown sand and pebbles, 6" fine banded sand, 3" brown sand and pebbles, and small glacial boulders. Towards the northwestern corner of the enclosure, the dense gray clays lie

close to the surface and water stands on them. Beach sands and gravels are more common in the Southern portion of the area, and the clay is quite deeply buried beneath them. In many areas here, large glacial boulders were encountered almost at the surface and made excavation very difficult. The trenches were excavated into obviously undisturbed gravel, boulder or clay deposits in every instance. Once these excavations were completed, all trenches were backfilled.

A variety of modern intrusions were found within the Great Hall foundations. Most intriguing were the fox run and fox pen. These had been built by a local resident, Samuel Crawford, about 1910 who raised foxes there into the 1930's. The evidences of these activities were mapped, photographed and selected artifacts from them saved. Of more casual interest were a few shallow pits which contained tin cans, modern bottle glass, round wire nails, etc. They were excavated to be sure that they did not conceal older remains. Also of some merit was one archaeological trench excavated into the southeastern corner of the Great Hall in 1937 by Ralph D. Brown (Figure 5).

Only a very few artifacts of the fur trade era were discovered within the Great Hall foundations; most of them were retrieved in the fox pen locality. Represented here were: clay pipe fragments, an oval and a "D" shaped firesteel, a flintlock hammer screw, a piece of lead bar stock, seed beads and 13 rosehead nails. No structural evidence of an earlier building was found.

The scanty number of rosehead nails found here and the general lack of late 18th century artifacts leads to the conclusion that the original Great Hall may have been held together largely with wooden

pegs; at least for the floors. The walls no doubt were of the post and sill type which does not require nails. Perhaps nails were used only in doors, door and window casings and on wooden trim. Presumably, the shingles would have required them also. Further speculation is that the more valuable portions of the building such as the doors, windows, and most of the structure was taken apart and moved by water to Fort William. Had the building been left standing, and finally burned down, many nails would have been left even from the casings and other trim. Little window glass was found in this area also.

Although there were some indications that a trench was excavated in an East-West direction through the center of the Great Hall by Ralph D. Brown in 1937, no trace of it was found in 1970 (Text Figure 4). Perhaps most vestiges of it had been destroyed by the reconstruction of the building in 1938-40. A discussion of Brown's excavations in this area during 1937 is present on pp. 86-89 of my synthesis of the Society's 1936-37 excavations at this site (Woolworth, 1963). Brown's major concern was to find the structure's site and to delimit its size so that it could be rebuilt as an Indian CCC project. It would appear that his excavations within this building's foundations were rather limited.

Over the years, there has been much conjecture concerning the location of the fireplaces in this building. According to Willoughby M. Babcock, who was in charge of the project, evidences of two fireplace bases were found here. Apparently the replacement fireplaces in the reconstructed Great Hall were built on their exact locations. Mr. Babcock also thought that some traces of an earlier occupation were

found while excavating the footings of one of the fireplaces in 1938. A careful watch was kept for such an indication in 1970, but nothing aside from a few fur trade era artifacts was found adjacent to the fox pen. This pen had at one time intruded into the building and was under the southwest corner of the eastern fireplace base. It is altogether possible that Mr. Babcock mistook similar materials for structural evidence (Babcock, 1940, p. 7; 1941, pp. 52-55).

After excavations had been completed around the Great Hall, the corners were marked, a backhoe was hired and the foundations removed. They were in poor condition and lacked footings or reinforcing steel and were unsuitable for reuse. Nothing of an archaeological significance was observed during this time. Of minor interest were a number of pieces of slate which were found underneath some portions of the foundations. It is probable that they were portions of the original walls and were deposited there for preservation during construction in 1938 (Figure 4).

Area in Front of the Great Hall

After completion of the test trenches within the Great Hall, operations shifted to the area south of the foundations. Here it was necessary to remove the stump of a large spruce tree which had grown up next to the building. Much effort was also expended in breaking up and hauling off the remains of a large concrete and stone step which had been in the approximate center of the southern wall of the building. Care was taken during this phase to disturb the earth as little as possible in the hope that archaeological materials might be found.

A number of test excavations were made here which demonstrated that there had been much modern fill placed against the exterior face of the southern foundation of this building. Therefore, a front end loader and a careful operator was secured, and approximately 1' of fill dirt was removed from an area about 10' wide and 100' in length. A close watch was kept for artifacts and structural remains, but little of importance was found, with the exception of modern remains such as the fox run.

The Fox Run and Other Intrusions

Samuel or "Sam" Crawford lived on this portion of the site from about 1910 into the 1930's and may have built a barn over a portion of the Great Hall. He raised foxes here for many years and had erected a fox run of woven wire which had crossed the southern foundation wall in two places. This feature measured 26' East-West, and a similar distance North-South, but its northern side was missing. At one time, it no doubt had a square form; perhaps the open end abutted against a building which closed the square. The fence had been built over by the Great Hall reconstruction in the late 1930's. It was supported by cedar posts and was placed in a trench about 1' wide and 2' deep. Stones were backfilled along the base of the wire to prevent the foxes from escaping. Within the fox run was located a much smaller fox pen which was about 6' wide and 11' long and dug into the ground to a depth of about 30". Portions of this pen were destroyed by reconstruction of the southern wall and a fireplace base (Figures 5 & 7 and Map 2).

Approximately another foot of earth was now removed from the area with hand shovels. The method followed was to carefully strip off 2" to 3" of earth at a time and to level up each square before proceeding deeper. A careful watch was kept for post molds, pit outlines and artifacts. During this period, large quantities of modern artifacts such as mason jars, bottle glass, wire nails, and stove parts were recovered. Mingled with them were a number of fur trade era artifacts such as rosehead nails, clay pipe stems, beads, and a few gun flints. The soil was removed with wheelbarrows.

Finally, the outlines of the fox run and several modern pits had been revealed. These intrusions were usually surrounded by sterile beach sands and gravels. No special efforts were made to excavate these pits as their fill was obviously modern. Our attention now became concentrated on a search for post molds. After much effort, and testing, a number of proven posts emerged which formed a line approximately parallel to the front of the Great Hall.

Post Molds From The Great Hall Porch

The locations and shapes of these posts are shown on Maps 1 and 2. It will be noted that there are 15 posts. Of this number, 5 have round post molds and 10 have square molds. Those posts with the round molds average about 9" in diameter and from 6" to 10" in depth. The square molds all were dug with a square shovel or spade. They average approximately 1' square and from 4" to 12" in depth. Many of these posts had fragments of rotted wood in their molds. A number of them had rosehead nails, bits of charcoal, or clay pipe stems in their fill. Three of the square post molds had rounded stones or

squared slabs of slate jammed alongside them as braces (Figures 9-11).

Inconclusive though this evidence is, it definitely demonstrates that a porch once stood in front of the Great Hall, and that it was approximately 10' in width and about 95' in length. It must have had a height which was about the same as the finished floor level of the Great Hall. Also, there appears to have been a step area located to the right center of the front of the building.

It is entirely possible that not all of the round post molds held posts which were associated with this porch. Posts 1 and 14, for instance, were not massive and hardly of a size to support a heavy porch. Post 15 which had a square mold was larger and deeper than any of the others. It appears to have held a large post and was heavily braced with many stones and slate slabs. Its function, aside from a support for the porch is unknown. Logically, it would appear very probable that many other posts were once here and that all traces of them have been destroyed by modern activities such as the building of the fox run, modern pits and the concrete marker footing.

One interpretation of these post molds is that a rather modest porch or piazza ran across the front of the Great Hall. It was between 9' and 10' in width. The inner edge of the porch rested on a stone ledge formed by the outer face of the foundation wall. The outer edge of the porch was supported by a series of posts. A number of steps led up to the porch. They were located in the right center of the building and were closer to the foundation than the outer row of support posts. Thus, the porch may have been divided into two sections by the steps which gave access to it.

Photographs were made of many of the posts. Some of these are reproduced in Figures 9 - 11 in this report. Each post was carefully plotted on a map and notes made concerning them. As a final test, each mold was sectioned vertically and its profile carefully studied. All posts were then marked with segments of 2" galvanized pipe and the profiles backfilled (Text Figure 6).

Excavations were completed in this area by extending outwards to the east and west in an attempt to find additional post molds which may have carried steps at each end of the porch, but to no avail. The completed excavation in front of the Great Hall was about 14' in width, 110' in length and 18" in depth (See Figures 7 & 8).

The Kitchen Structure

In late June of 1970 a request was made that the excavations be extended into the area to the rear of the Great Hall in an effort to locate a Kitchen building. To a degree this request was probably based on historical research which had shown that the Great Hall at Fort William had a kitchen building to its rear. In any event, an area measuring approximately 50' North-South by 100' East-West was laid out north of the Great Hall. A skilled machine operator was engaged and proceeded to strip the sod from the location. Afterwards, shovels and mattocks were used to level off the area and to remove sod which had been missed by the machine.

Our attention was swiftly drawn to a raised area in the center of the new excavations. Here a line of squared slate was found, and after minor cleaning, a rectangular stone outline approximately 5' by 7' appeared. In its center was a rich deposit of white wood ashes and mixed in with them were quantities of rosehead nails, broken bits of glazed ceramics, and fragments of clay or kaolin pipes. There was no question but that this was a stone outlined fireplace and that it was in the approximate center of the remains of a vanished building. Immediately to the north of the fireplace was a jumble of large round boulders, but their significance was not yet understood.

Immediately after this unexpected discovery, the North-South line which ran through the center of the Great Hall was extended northwards for a distance of approximately 70'. Oddly enough this line ran through the fireplace and the cluster of boulders adjacent to it. This strongly implied that the two buildings were associated with each other.

Thereafter, a grid composed of squares which measured 10' on a side

was staked out over the area. Each stake was assigned a number which correlated with the baselines and the 0-0 point in the center of the Great Hall. A workman was assigned to an individual square and given careful instructions on how to remove thin layers of soil and to place any artifacts or other materials in a paper bag which had a number corresponding to the stake which designated the square. Continuous efforts were made to excavate each square in 3" levels and to keep all squares at approximately the same level.

Within a few days, it was evident that we were excavating a building which contained large quantities of ceramics, glassware, cutlery, nails and animal bone. Also present were a few segments of rotted wood, presumably from the floors, and pieces of angular shale with squared faces. Care was taken to accurately record the dimensions and positions of these building materials. A plane table and alidade were present for this use. Gradually, it became apparent that there was not much structural evidence at hand. The fireplace and the boulder outlined pit immediately north of it, which we called the "Cooler" for want of a better name, were the major structural features which had survived. Evidently, this survival had been only because of their sub-surface nature. Obviously, much of our attention was then concentrated on these features and the numerous artifacts.

From time to time, a few squared slabs were found which appeared to match up with others and to form patterns. This was especially apparent in a line west of the fireplace and cooler. Here, a series of slabs were found which formed what may have been the supports for a stringer which carried a portion of the joist load. Commonly, these "piers" consisted of single courses of squared shale slabs laid into the soil. Towards the close of the excavation, a series of probable post molds were found along the southern wall of the building.

The eastern and northern sides of the structure were more similar to each other. The eastern wall for example was defined by a line of braced post moulds running from the southeastern corner to the northeastern corner, which was a large stone. In between these stones were a number of stone-braced post moulds which appeared to form the outer limits of a porch. A part of this outline was incomplete, presumably because of a drainage trench placed in this location in 1963. The northern building wall was also defined by stone outlined post moulds. In this instance, the wall line commenced at the northeastern corner and ran west to an indefinite terminus. This line was composed of both flat slabs of shale and boulder outlined post moulds. Paralleling it at a distance of about 8' was an almost perfect duplicate line of boulder-outlined post moulds. Presumably, this outer line was the outer limits of a porch which had been supported on posts. Still farther out to the north was a line of stone-outlined post moulds which apparently delimited an attached shed (Map 3).

The western wall of the building was the most poorly defined of all. It began at the southwestern corner, continued to a stone outlined post mould and there it stopped. Unfortunately, this portion of the building site had been disturbed to a degree by construction activities during the 1938-40 reconstruction of the Great Hall. A large area was stripped beyond this location in an effort to find further structural evidence, but without success, aside from a carefully prepared stone base which consisted of a round stone surrounded by a circle of smaller stones. About three feet north of this was found a slate slab and near it the butt of a fallen post or perhaps a horizontal log.

Approximately 40 slate slabs which measured about 1-1/2" thick by

1' wide and 15" long were found in the area to the east of the fireplace and the cooler. They lay at random. Underneath them were quantities of animal bone, teeth, cutlery, broken ceramics and bottle glass. From all appearances, this area had been used for food preparation, and in all probability, a few simple cupboards and wooden chests had stood against the rear of the fireplace and the cooler.

The chimney and upper portion of the fireplace had fallen down, perhaps a few years after the building had been torn down. Gradually, the mound of stone had been taken by nearby inhabitants for reuse in their own dwellings or storage structures. A similar, but much smaller assortment of stones was found west of the fireplace. These too appeared to have been deposited at random but were not located over quantities of artifacts or discarded animal bone.

Porches

Evidence, consisting largely of stone-outlined moulds were found in lines paralleling the outer walls of the building on its eastern and northern sides. In general, these lines were situated about 8 to 10' distant from the major outline of the building. Supportive evidence indicated that these represented the outlines of porches peripheral to the building. A less distinct, but suggestive situation existed on the southern face of the building. Here, there were large quantities of clay pipe fragments, broken glass, bottles, and other artifactual evidence which suggested that people had lounged around this area and had thrown down trash for a long period of time. It is probable that this trash was mostly deposited under a porch rather than on the ground where it would be a hazard to passers-by in addition to being unsightly. Further, this area fronted onto the "Fur

Trade Era Drain Trench" which in all probability was covered over at least by boards. Otherwise it would have been a hazard to pedestrians. At the same time, the artifacts found therein suggest strongly that it must have been open for a considerable length of time.

The Kitchen Building Materials

Most of the structure was composed of perishable wooden members and only tiny portions of them have survived. Their presence, however, can be inferred from scanty bits of architectural evidence and data preserved in the historical record. As one would suspect, a larger proportion of the inorganic materials from the building's fabric were recovered during the excavation.

Local resources were utilized for construction materials. The roved slate, for instance, used in the fireplace, chimney, and a few piers was quarried at the foot of nearby Mount Rose. The rounded field stones used in the cooler or dry well probably were taken from the building site. The large quantity of hewn timbers and sawn boards used to form the walls, roof, floors, and partitions of the Kitchen was no doubt obtained from standing trees in the nearby forest. A very limited quantity of building hardware items was imported from the eastern seaboard.

The windows and hardware such as pintles, hinges, locks, hooks, nails, etc. were made in eastern Canada or England and brought to Grand Portage by canoe or sailing vessel. Likewise imported was the well known Spanish Brown paint and the brass kettles from which some window and door flashing was made. The Spanish Brown paint is discussed in more detail on page 119.

These objects are described in detail in a portion of this report

entitled, "Building Hardware." It is apparent from the rather scanty number of such objects which were found that most of them were salvaged and removed from the site. Here I am referring to hinges, pintles, door hooks, etc. It should be evident that these items were usually attached to finished building components such as doors, windows, shutters, and portable cupboards. Logic alone would indicate that these things were removed from the building and transported by water to Fort William. There, they would have been reused in building this new North West Company depot. With sailing vessels such as The Otter in use on Lake Superior, this would have been feasible.

Supportive evidence for this viewpoint is afforded to a degree by the many clinched nails which were found amidst white wood ash in the fireplace. Obviously, they had not been withdrawn from the wooden members which they fastened together before the wood was burned. It would have been logical and simple for workmen razing the Kitchen to have cooked their last few meals in the fireplace. Presumably, they would have used wooden trim and scraps which were at hand from window, shutter, and door removal.

Wood and Bark From the Kitchen Structure

During the course of excavation, a watch was kept for any evidence which would shed light on the construction or other aspects of the structure. Particularly noticeable were many fragments of rotted wood. The majority of these specimens were in a badly rotted condition and appeared to be from the flooring or floor joists of the building. A series of 29 wood samples were preserved and identified by the B. F. Kukachka, Center for Wood Anatomy Research, USDA Forest Service, Forest Products Laboratory, Madison, Wisconsin (Kukachka, 1972). These samples are tabulated:

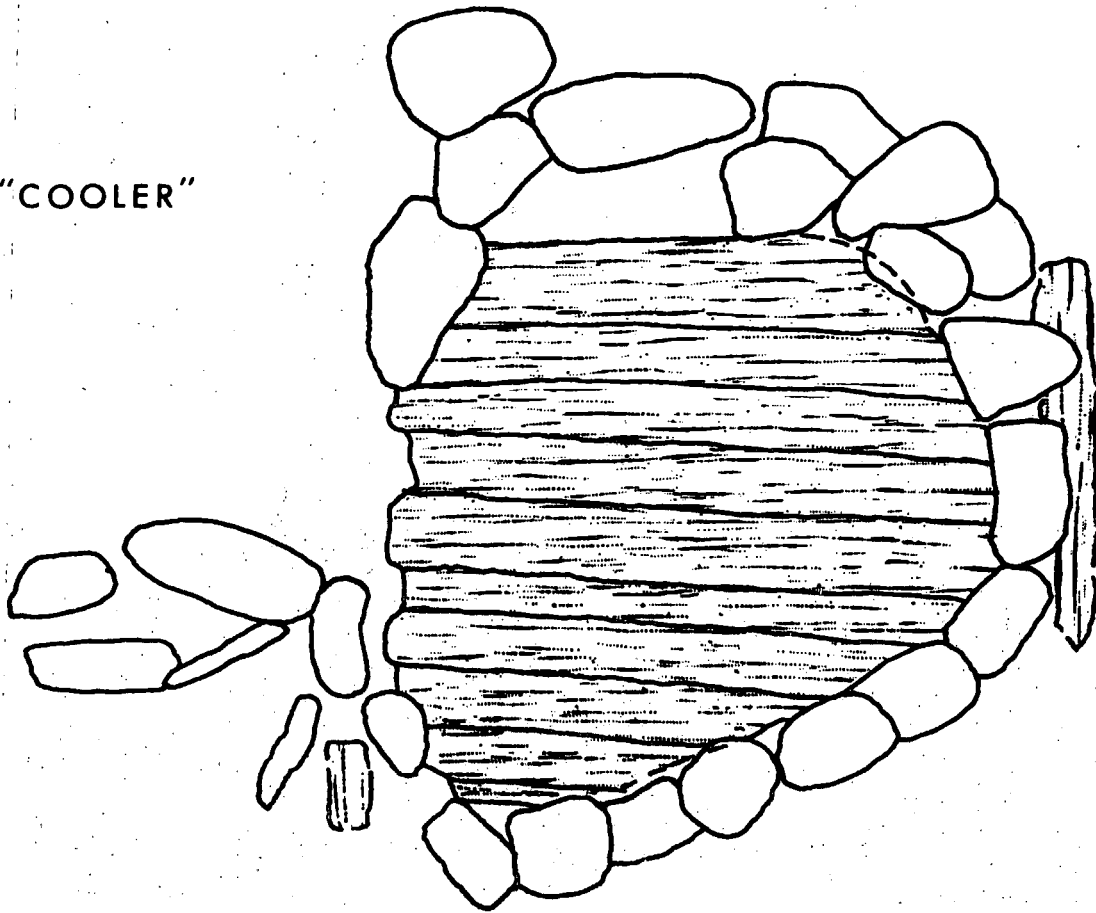
TABLE 1

WOOD AND BARK FROM THE KITCHEN STRUCTURE

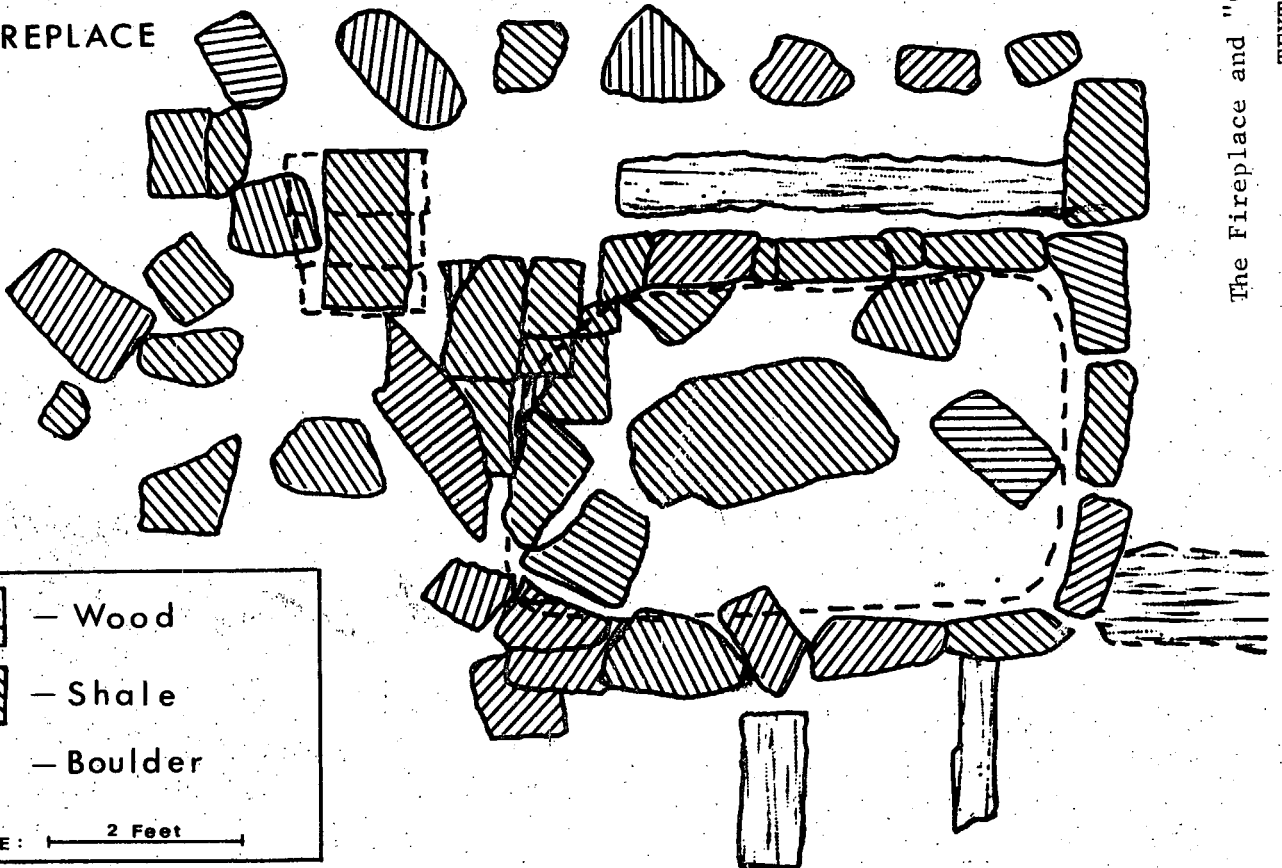
<u>Species</u>	<u>Number of Specimens</u>	<u>Comments</u>
White Pine	6	
Tamarack	8	
Northern White Cedar	7	
Spruce	2	
Birch	2	
Birch Bark	2	
Willow Root	1	
Red Oak	1	With glue or varnish







"COOLER"



FIREPLACE



	— Wood
	— Shale
	— Boulder

SCALE:  2 Feet

The Fireplace and "Cooler", Kitchen Structure

TEXT FIGURE 7



The Fireplace

This distinctive structural unit was located in the approximate center of the Kitchen building. Near its western edge was stake 0-E-W-50N. The fireplace was situated on a slight rise in the land surface which elevated it about 6" above the other portions of the building. When first discovered beneath the sod, it was readily recognized because of its white ash fill which was outlined by pieces of slate from nearby Mt. Rose. This feature was formed of slabs of slate laid in a roughly rectangular form which measured 4'9" North-South and 7'0" East-West. These stones ranged from 6" to 12" in width and 12" to 18" in length; with the majority being about 15" in length and were from 2" to 4" in thickness (Figures 17-18).

The complete outline of the fireplace was readily visible as it was filled with white wood ashes, rosehead nails, bits of decorated ceramics and burned earth. Surrounding this fill was the inner faces of the rectangular stones which formed the fireplace. The interior dimensions of this feature were 3'6" North-South and 5'9" East-West. The rich fill within this feature extended downwards approximately for 1'. At the bottom of the fireplace was a number of other large and somewhat irregular pieces of slate which formed a floor or base for it (Text Figure 7).

The walls of this feature were standing to a height of about 12" and consisted of from three to six courses of dry laid masonry. Clay had been used as a mortar and small stones had been inserted at intervals to bear some of the weight. The fireplace had been made by first excavating a rectangular pit about one foot below grade and

then leveling the large glacial boulders. Then, a first course of flat slab of slate was laid on a bed of clay and subsequent courses laid above it in clay mortar. Little evidence of the fireplace survived aside from these few courses of stone.

When first built, or for that matter, when the Kitchen was abandoned, there is a great probability that the fireplace and its chimney survived intact; perhaps for a number of years. Gradually, the clay mortar would have washed out from between the stones, and they would have begun to fall to the ground. It is very possible that there was a waist high mound of fallen stone in this location for a few years at least. Then, it was probably taken away for reuse by other inhabitants such as the local Indians or some of the other trading concerns in the locality. We do know that there was little evidence of the former depot when the site was revisited by David Thompson in 1822. Therefore, we may assume or conjecture at least that the stones had largely been taken away and reused before that time.

Some additional evidence relating to the fireplace and chimney was found after from 4" to 6" of soil had been removed from the surrounding area. A considerable quantity of slate slabs was found to the west and east of the fireplace. Presumably, they had fallen from the chimney and upper portion of the fireplace. These slabs were carefully mapped and then removed. A number of them were at the northern and western perimeters of the fireplace. These appear to have fallen in a purely random fashion and were quite close to the fireplace. They were situated in an area measuring approximately 10' North-South by 8' East-West. These slabs seem to have fallen from the chimney.

Underneath them were found considerable amounts of animal bone, glass, decorated ceramics, cutlery and some small building hardware such as padlocks.

It is readily evident that we have little evidence concerning the height or design of the fireplace or its chimney. About the only concrete things concerning it are its location and basal dimensions. There is some evidence which indicates that the fireplace had been rebuilt at least once. The clay chinking between the fireplace stones contained small artifacts such as bits of pearlware and creamware, beads, clay pipe stems, etc. Logically, this would have come about from using clay which contained such materials as a mortar in rebuilding it. Also, bits of carbon were found at the base of the northeast face of the fireplace, adjacent to the bottom course of stones. This was well below the floor level of the building and below the level in which any cultural materials were found (Figures 17-22).

Nothing resembling a stone hearth was found. The fireplace opening and hearth appear to have been on its southern face. This would have placed it facing the doorway and along the long axis of the fireplace which was a rectangle with its long axis running East-West. It would have been very difficult for the opening to have been on the northern face of the fireplace as this would have placed it directly in front of the cooler; hardly a logical work space. Further, few artifacts were found between the cooler and the fireplace. I interpret this as evidence that little activity took place in this area. Additional evidence is that a large quantity of kitchen debris such as cutlery, animal bone, etc. was found in an area northeast of

the fireplace in Squares OE-W-50N to 10E-50N and OE-W-60N to 10E-60N. These materials will be discussed in more detail in another portion of this report. They are interpreted here, however, as evidence of a food preparation area. Presumably, this area to the right of the fireplace would have been in close proximity to the cooler, to cupboards, and to work tables.

A number of details concerning the fireplace can be examined by referring to a line drawing accompanying this portion of the report (Text Figure 7). The northern wall of the fireplace consisted of approximately five layers of stone laid in a clay mortar. It had leaned to the north, but it is impossible to tell whether this had taken place while it was still in use or at a later time (Figures 17-22 show various aspects of the fireplace). Immediately to the north of the fireplace were found the remains of a large log. Its function is open to at least two interpretations. The first surmise is that it may have been a structural member in the building such as a joist which ran to the rear of the fireplace. It could also have been a part of a support which was intended to keep the fireplace from collapsing (Figure 21).

In my opinion the fireplace was used right up to the moment when the building was abandoned. By this time, a selection had been made of the furnishings which were to be removed for future use at Fort William. Discarded materials such as benches and perhaps trestle tables, along with window and door casings, etc. from their structure and nearby buildings were broken up and used in the fireplace to cook a last few meals. This is demonstrated by the fact that the fireplace was full of white wood ashes and a large and varied quantity of cultural debris when

it was uncovered. The most numerous artifacts were quantities of rosehead nails. A majority of them were bent over at a right angle or otherwise showed signs of usage. It would have been impossible, for instance, for these nails to have been withdrawn from boards without straightening them. Therefore, they must have been the residue of furnishings and building trim consumed in the fireplace. Many of the nails showed signs of burning on them. They are tabulated below:

TABLE 2
NAILS FROM THE KITCHEN FIREPLACE

<u>1-1/2"</u>	<u>2"</u>	<u>2-1/2"</u>	<u>3"</u>	<u>3-1/2"</u>	<u>4"</u>	<u>4-1/4"</u>	<u>5"</u>	<u>Total</u>
175	70	73	95	26	43	7	7	496

This sample represents nearly 29% of the nails found at the entire building site. It is also readily apparent that the bulk of these nails are 3" and under in length. Also found within the fireplace were 151 nail fragments. These are 13% of the nail fragments found at the site.

Also present within the fireplace were many clay pipe stems and bowl fragments; burned gun flints, pieces of clear window glass, clear bottle glass, clear glass tumbler bases, clear glass fluted tumbler bases, creamware and pearlware fragments, beads, dark green bottle fragments and animal bones. Present also but in lesser quantities, often as single examples, were: a keyhole saw blade, a copper tinkler, a brass candle snuffer, brass buttons, a musket ball, a pen knife blade, pewter spoon fragments, and steel knives and forks. Collectively, these materials could be characterized as the general types of materials which would have been used in food and drink preparation or storage and items of personal use which appear to have been lost or discarded by individuals who either

worked, ate, or lived in this building.

Care was taken during the excavation of this unusual feature to record all types of evidence concerning it. Special attention was given to slate slabs found nearby and to pieces of rotted wood. These were plotted on a map with more than the usual degree of care and also photographed. Nothing of an unusual nature was observed in the area to the left of the fireplace or to the west, aside from a few randomly scattered slate slabs which did not form any discernable pattern. In my opinion, they had fallen from the nearby fireplace and had not been intentionally placed in these positions. There is one exception to this statement. Near the northwestern corner of the fireplace, three rectangular slabs of slate about 9" in width by 18" in length were found. Superimposed over them was another slab of slate measuring about 10" in width and 20" in length. This feature was interpreted at that time as being a probable pier which once carried a wooden support underneath the building (Map 3).

This evidence is discussed at some length to demonstrate that there was no evidence to indicate that an oven was ever built adjacent to the fireplace. The slate slabs for instance, with one exception, were of only one course and randomly deposited in the soil. In my opinion, an oven would require a substantial base similar to that of the fireplace. The fireplace base, for instance, was set at least a foot below the grade of the land surface.

Further negative evidence regarding the presence of an oven in this area is afforded by an examination of the numbers and kinds of artifacts found there, which are as follows: pipe stems, bottle

glass, tumbler bases, creamware, pearlware, animal teeth, beads and rosehead nails. These materials were found at random over the area. Had an oven been there, some areas at least would not have had this type of artifact yield.

The Cooler or Dry Well

This highly unusual feature was discovered at about the same time as the fireplace, but its true nature was not determined until it had been excavated. It was located in the north center of the Kitchen building and about 3'6" north of the fireplace. Like the fireplace, it lay on a slight rise in the land surface which elevated these features about 6" above other portions of the building. When first observed after the sod was stripped from the area, it had the appearance of merely another cluster of boulders left by glaciation (See Text Figure 7 , and Figures 15,16 and 22).

The outline of this dry well or cooler was formed by round and oval granite boulders buried in the clay in the rough form of a "D" with its long axis running North-South. It measured approximately 6'6" on interior dimensions in any direction. The exterior dimensions were approximately 8'6" North-South and 8'0" East-West. Its outline at the ground surface was composed of about 20 rounded or oval granite boulders which ranged from 9" to 12" in diameter and from 12" to 18" in length. Their average weight was between 30 to 60 pounds. Most of these boulders had rounded edges though a few pieces of roughly square slate were also in the general area. There was nothing about these boulders, except their relatively uniform

size and appearance to distinguish them from other granite boulders which are present here in great numbers.

The upper 6" of fill on the interior of the cooler was composed of fired red clay with rosehead nails in it. This deposit may have been formed by burning of wooden furnishings; perhaps when the building was being abandoned. Underneath the clay was a layer of cedar boards approximately 2" thick, 6" to 9" wide and running the width of the feature. They were badly decayed and could not be salvaged. These boards rested on a ledge of clay inside the stone outline and do not appear to have been fastened together. Even as loose boards, they were strong enough to bear a person's weight by themselves. Entrance to the cooler was probably gained by lifting one or more boards, laying them aside and then reaching in to obtain foodstuffs or liquors.

Beneath the boards, the cooler was filled with about 8" of dark organic fill and a line of loose boulders which lay across the center of the feature. As the excavation progressed, it became apparent that this dry well had been formed by excavating a roughly circular hole about 8'6" in diameter to a depth of about 18". Thereafter, a single course of granite boulders was set around the circumference of the hole and bedded firmly. One or two boulders of different sizes were then laid on top of the lowermost layer, probably with clay as a mortar. Care was taken that this dry laid masonry came out at about the same elevation at its upper portion. No definite statement can be made about the stones found within the cooler. They may have fallen in from the western edge of the circle, which was incomplete, or they could have been used as supports for

the wooden cover or even as a divider within the hole at a later stage in its use. This dry well had a depth of about 1'6" and its bottom was irregular.

The quantity of artifacts recovered from this location was disappointing. It was readily evident that they were discarded materials of little value. Randomly deposited within it were the following: fragments of bottle glass, decorated and undecorated ceramics, a large pewter spoon, a clear glass tumbler base, the stem and base of a wine goblet, rosehead nails, wood fragments and teeth from domestic cattle. It is probable that use of this storage area was not discontinued until near the close of the site about 1802. At that time, one of the surviving domestic animals, a calf, was eaten and some of its remains thrown into this pit.

When initially found, it had been our hope that this feature would develop into a large stone lined well filled with quantities of late 18th century artifacts. Such was not the case. Once its true form had been discerned, speculation arose concerning the functional use of a dry well in this building. To me at least, it seemed reasonable to call it "The Cooler" as it was much similar to dry wells used in rural areas prior to refrigeration.

In the not too distant past, spring houses or wells were often used to keep milk, cream, butter, and meats cool. A substitute for them was a simple hole in the ground sometimes lined with boards, wooden staves or a barrel. At times, a dry well would be laid up with available stones. This particular one most probably was used for preserving dairy products from the small herd of cattle kept at the site, meats and wines.

Conclusions and Speculations Relative to the Kitchen Structure

The location chosen for this building was wet during the fur trade era and still is today. In the period ca. 1785, two trenches outlined with boards were placed in the area to serve as drainage features. It will be noted that one drainage trench ran under the northern portion of the Kitchen and another a few feet in front of its southern edge. To me at least, this is absolute proof that the building was elevated above the wet, boggy soil on which it was built. The building was erected on a combination of wooden posts and stone piers which raised it from 1' to 1'6" above the surrounding area. Further, there is some evidence which indicates that wooden stringers were likewise placed on stone piers to support the floor joists in their relatively large span across the building.

Quantities of trash such as broken bottles, animal bones, clay pipe fragments, etc. were found under portions of the building, particularly the western wall. It is difficult to offer an explanation for the deposition of these materials unless the structure was elevated off the ground. Further, the presence of these objects argues against a stone foundation surrounding the building. How could they have been thrown under it if a wall was there?

There is a distinct possibility that the Kitchen predates the erection of the Great Hall; indeed, it may have served as a predecessor to it and have been reused as a kitchen facility after the Great Hall was built. Whatever the case, we can be sure that the Kitchen was built after the Central Palisade Trench which lies to the south of it had had its pickets removed and was filled in. Indeed, the construction of the Kitchen and the Great Hall both are closely linked with the expansion of

the palisaded enclosure to the west and northward. This is discussed in more detail elsewhere in this report.

This building was closely associated with the Great Hall in a functional sense for it served as a food storage and preparation area for meals, banquets, balls, etc. which were held in that building. The Great Hall, of course, appears to have been used only seasonally when the directors of the company came to Grand Portage from Montreal in early June of each year and remained for a month or six weeks. Here they met the wintering partners, clerks and other employees and conducted their business amidst some traces of luxury. To the best of our knowledge, all foods and beverages were prepared in the Kitchen and carried into the Great Hall for consumption. Seasonally at least, this probably caused an influx of a chef, cooks, and a variety of kitchen help into the Kitchen building (Thompson, 1970, pp. 8-9).

Perhaps the Kitchen building was the living area and quarters for these temporary personnel. The composition of this staff will remain a source for conjecture unless documentary evidence to clarify it is found. There is, however, rather strong artifactual evidence such as beads and broken stone pipes to indicate that Chippewa Indian women were either employed there or lived there with white males. This structure may well have been the mess facility for the permanent complement of employees who resided at the depot on a year-round basis.

Soon after excavation of the Kitchen began, it was noted that the building's center line coincided almost exactly with the north-south line through the Great Hall. As projected into the Kitchen, this line bisected the Fireplace and Cooler. Presumably, this could only mean that one of

these structures had been erected in line with the other.

A directly comparable situation existed at Fort William which was constructed after 1802 when a decision to abandon Grand Portage had been made. A ground plan of Fort William made by Lord Selkirk in 1816-17 depicts a rectangular Kitchen building immediately behind the Great Hall. Its center line is also in alignment with that of the Great Hall. A covered central passageway led from a doorway in the center of the Kitchen into the rear of the Great Hall. A pantry, presumably for off hour refreshments of the partners, is also attached to the rear of the Great Hall (Dawson, 1970, pp. 38-39).

The Kitchen at Grand Portage was roughly square and about 30' on a side, though there is some evidence which indicates that it may have been a few feet longer on its north-south axis and correspondingly shorter on its east-west length. All available evidence points towards it being a wooden building of the post-on-sill type which was erected on a combination of wooden and stone piers to elevate it above the wet soil of the area. Since its discovery, there have been suggestions that this building may have been of a story and a half in height and that sleeping quarters for some Kitchen personnel were in a loft-type arrangement. This space would have been lit by gable windows. An outside stairway may have led to this loft.

The structure appears to have been surrounded on three sides by wooden porches which were approximately 8' wide. These appendages were located on the south, east, and north sides of the building. The evidence for their presence consisted of many stone braced post moulds which ran around three sides of the building at a distance of about 8'.

The relatively wet climate during the spring months of the year and the boggy ground would have made such porches an asset in the preparation of foodstuffs and a convenient avenue of access to the nearby well and perhaps to dry firewood. Such a structure would have been in keeping with traditional French-Canadian dwellings which were used in Quebec, the Illinois Country, and to some extent in the western Great Lakes region.

There is also some evidence which suggests that one or more sheds were erected on the northeastern corner of the building. Again, there were stone braced post moulds in this area which formed an outline measuring about 14' north-south by 22' east-west. Presumably, a shed of these dimensions would have been very useful for the storage of dry firewood, bulk foodstuffs in wooden barrels, etc.

Additionally, there is evidence consisting of broken window glass along the building outline to show that windows had been present along at least the west, east, and south sides, and perhaps along the northern facade as well. It is very probable that there were two or three doors in the Kitchen. One of them would have been on a line with the 0-0 line which ran through the North-South axis of the building and would have faced towards a matching doorway in the rear of the Great Hall. It would have been used for the delivery of food and drink to the Great Hall. Supporting evidence for this concept lies in the large amounts of clay pipe fragments which were found in front of the Kitchen to the west of this doorway. Presumably, they were deposited by loungers who smoked on or in front of a porch at this location.

The "cooking face" of the fireplace appears to have been on the southern side which faced the doorway in the southern wall of the building. Convenience alone indicates this arrangement as the other long face of the

fireplace faced the cooler, and there was not enough working space between the fireplace and the cooler. Other hints as to the functional usage of the Kitchen interior are scarce. A large number of stone slabs had fallen from the chimney and perhaps the upper portions of the fireplace to the northeast. Here they overlay broken animal bones, cutlery, and pieces of ceramics and glass. It was apparent that the area to the east and north of the fireplace had served as a storage area with probably one or two wooden upright cupboards and wooden chests. It was also a food preparation area with wooden tables nearby. These conclusions were reinforced by finding two padlocks of a type used on chests or cupboards in this area. Additionally, large quantities of broken dishes were recovered there. Ultimately, distribution studies of the artifacts from the building will allow a more precise determination of the functional usage of the floor space in this structure.

The well which was dug near the southeastern corner of the Kitchen was logically used by cooks and kitchen attendants to obtain water for cooking, dishwashing, etc. Access to it could have been readily had by using a route out the southern doorway and down the front steps or by steps off the corner of a porch on this face of the building. A second doorway probably existed in the northeast corner or eastern wall of the Kitchen and led to a porch on the eastern side of the building. Such a door was no doubt a great convenience for access to the well or from obtaining firewood from nearby storage areas. It is probable that still another doorway led from the northern wall of the Kitchen into an attached storage shed which was used for the dry storage of commodities such as wild rice, dried beans, dried peas, flour, corn, pickled beef and pork, and other foodstuffs which were kept nearby for use.

There is absolutely no evidence of a structural or artifactual nature which indicates in any degree that a stone oven was built adjacent to the fireplace or that a stone foundation wall was built around the building's perimeter to support it and to elevate it. Walls of this type are placed in trenches which serve as footings--no such trench or quantities of stone were found here.

The Fur Trade Era Drain Trenches

Two drain trenches were associated with the Kitchen building. One of them was situated at the northern portion of the structure; the other to its front or to the south. Both of them had been used to drain standing surface water from the wet area in which the Kitchen was erected. The northern most trench was discovered first.

This feature was uncovered in 1936 approximately 38' north of Corner G. Its function, other than to drain this portion of the enclosure, was not understood at that time. A discussion of this feature from the report on the 1936-37 excavations at the site is repeated here. It will be noted that the conclusions set forth at that time are yet valid, but that we now know that this drain served to remove standing water from the area to the rear of the Kitchen building. This trench ran through the palisade north of Corner G and then turned diagonally to the southwest. Its end, in fact, made a rather sharp turn and then ran almost due south.

In 1936 considerable portions of this trench, and its wooden lining, were uncovered and left exposed to the air for an unknown length of time. Undoubtedly, this furthered the process of decay for the wooden members. Excavations in the northeastern portion of the Kitchen in 1970-71 uncovered some remnants of this wooden lined trench, but they could not be followed for any distance within this building. Much difficulty was encountered in attempting to trace this trench further west and southwest. In 1970-71, we had apparently succeeded only in uncovering the remnants of the trench excavated in 1936. It had undergone further deterioration since then and could

not be followed further. In my opinion, the trench ran under the Kitchen for a distance of perhaps 5 feet or more. This, of course, substantiates the belief that the Kitchen stood elevated above the ground on posts and a foundation. Little of significance concerning its physical nature was found aside from a disturbance in the earth and a few pieces of badly rotted wood which had formed its sides and bottom. The need for a drainage trench here was readily apparent in 1970-71. So much surface water stood here, especially after rains, as to require the excavation of a modern trench roughly along the northern wall of the Kitchen. Even with this, it was difficult to drain off all of the water and to excavate in a satisfactory manner. A discussion of this feature from the 1936-37 excavations follows:

"Inhabitants of the fur post found the ground wet, especially in the rear portion of the stockade enclosure, as it is today, and built an open wooden sided drain to alleviate this condition. Evidences of this feature were found during the excavation of the course of the palisade trench line between Corners H and G in 1936. It crosses this portion of the palisade obliquely 38 feet north of Corner G. Some 22 feet of the drain was exposed inside the stockade enclosure and 28 feet of it outside of the enclosure. More of it undoubtedly lies under the present day visitor's parking lot.

When exposed, most of the boards which comprised the sides and bottom of the drain were in a fair state of preservation. They were found at a depth of 18 to 21 inches below the ground surface. Hand hewn boards from 8 to 10 feet in length and about 2 inches thick and 10 inches wide had been laid in an open trench in a "U" shape. The top was probably left open. Although simple in design, it undoubtedly served to drain away surface water from this area into Grand Portage Creek" (Woolworth, 1963, pp. 114-115).

A second and hitherto unknown drainage trench was found to be associated with the Kitchen building during the 1970 excavations. This

trench ran parallel to the front of the building but was located about 8 feet south of it. This trench was immediately south of the "Central Palisade Trench" which had been found in 1936-37 and north of a modern drainage trench (Text Figure 6).

This late eighteenth century drainage trench was outlined by two roughly parallel rows of large stones which were about 18" apart. The base of the trench was about 20" below the ground surface and its sides and bottom had been cribbed with wooden boards which may have been held in place by wooden stakes. Some indications of stakes were found during the exploration of this feature. The general outline of the trench was that of a "V" with the bottom truncated or flattened. At one time, this trench may have had a wooden or even a stone cover.

The trench began at 20E-30N, a distance of 7' north and west of the well and continued westward for approximately 42'. It terminated in a rectangular sump pit about 2.5' west of 20W-30N. Elevations were taken along the course of the trench, but these were inconclusive. They showed that the approximate depth of the feature was about 19" and that it appeared to slope westward until it merged into an earthen sump pit which was not completely excavated. That feature measured approximately 4' north-south and more than 3' east-west. It was about 30" in depth and had apparently served to hold water drained off from the area of the well and from in front of the Kitchen (Maps 3 & 4; Figures 13 & 14).

There is a great probability that a wooden floored porch extended to the northern edge of this trench or that it even overlay it. Large quantities of artifacts such as beads, pipe stems, bottle glass, ceramics

and animal bones were found within and adjacent to this trench. There can be little question but that this area was well traveled by cooks and kitchen employees. Also, many of them spent at least some of their leisure hours lounging in this vicinity and left artifactual evidence of their presence.

This drainage trench should be restored for the bit which it would add to the interpretation of the Kitchen area.

The Central Palisade Trench Line

When the Society undertook the excavation of Grand Portage in 1936, one of the more interesting discoveries made was that the palisaded enclosure had been divided into three sections. Questions immediately arose concerning these areas. Had the post started out as a rather small enclosure and then been expanded twice, or had it been reduced in scope at the time of its abandonment? For ease of reference, these portions of the enclosure were designated as Areas A, B, & C (Text Figure 6).

The historical record has not been conclusive or even very helpful in answering these questions. We know that the French under La Verendrye came to Grand Portage in 1731 and that they built a cabin or two, perhaps near the beach, for storage. As time went on, there was probably a more elaborate post created on the bay, but we know nothing of it. John Askin, a British trader, came to Grand Portage about 1768 and cleared standing trees from a portion of the site on which the North West Company's depot was operating in 1802 (Nute, 1940, p. 134). Logically, Askin first occupied Area A.

In my own opinion, it is plausible to assume that Askin settled on Area A about 1768 and then expanded into Area B to the westward as more space was needed. This was probably around 1778 when the North West Company was getting well underway. A third and final expansion into Area C took place about 1785 as the company assumed a more mature form and development. If these conjectures are approximately correct, we can with some confidence assign a date to the time period in which the Central Palisade Line was torn down to make space for the Kitchen building. Closely connected with the demolition of the Central Palisade Line between Corners D and G was the erection of the Great Hall and perhaps of the Kitchen structure which served it.

When found in 1936-37, this Palisade Line had been filled with large

stones and badly rotted pickets. In about 1938, it was rebuilt but had fallen down by about 1958 and was not rebuilt again. In 1963 while large scale excavations were underway at the site, a need arose for drainage in the rear portion of the enclosure. At this time, the trench was roughly cleaned out with shovels in an effort to use it as a drainage ditch. Thereafter, it was filled with pea gravel. During the excavation of the site in 1970, this trench was avoided because of its fill. Also, it had been excavated twice and could be expected to yield little new information.

The discovery of the Kitchen building and its evident close association with the Great Hall at last offered an opportunity to solve the long standing problem of the relative use and age of the three areas within the palisades. It was apparent that the palisade was older than the Kitchen building and that it had been torn down at about the same time as when the building was erected. Further, the Great Hall and the Kitchen were closely connected and of the same approximate date. Logically, they would have been built about 1785 when the North West Company underwent a major expansion. At approximately the same time, the palisades were extended further northward on the west, north, and northeast to enclose an additional area of about an acre. The Kitchen was then built and drainage ditches placed around it to keep the ground reasonably dry. The nearby well may have been dug about the same time (Map 4 and Text Figure 6).

The Well

A "D" shaped well lined with wooden boards and barrels was found near the northeastern corner of the Great Hall in the fall of 1937. It was excavated at that time, but its association with a Kitchen building was not then suspected. It was only with the discovery of the Kitchen in July, 1970, that a fuller understanding of the well and its usage was achieved. We know now that the well was located approximately 16' southeast of the southeastern corner of the Kitchen (Map 4 and Text Figure 6).

The close proximity to this building gives a strong indication, almost an imperative one, that the well was used largely for culinary purposes. Access to it was probably at times from the front door of the Kitchen. More commonly, it was probably from the corner of a porch which would have been only about 4' from the well. A cook's helper carrying wooden pails of water from the well into the Kitchen must have been a common sight during the occupancy of this building.

There is absolutely no evidence which enlightens us concerning a super-structure or well house around the well opening. In all probability, it was four-sided, made of wood, and formed around four wooden stakes which were sunk into the ground at the well perimeter. Very probably, there was a wooden covering or roof over this enclosure which served to keep debris out of the water. This concept is supported by the probability that some type of pulley or windlass was used for lifting heavy pails of water. Such a device would have to be suspended from wooden members of some

strength which logically would be elevated to a point immediately below a roof.

In my opinion, it is doubtful that a masonry well house was erected here as there is no evidence of it at all. Secondly, only clay mortar has yet been found associated with late 18th century structures at this site. Such a mortar would have swiftly been washed out by rains or water splashed from the well. A third possibility is that a dry laid well curbing of slate slabs could have been placed around the well orifice, but this would have not supported a roof nor a pulley for the drawing of water.

It is recommended that a wooden well house be reconstructed here to surround and protect this well which should be reopened as an interpretive feature of the site. Further, some provision should be made for the drawing of wooden pails of water from the well to demonstrate its usage. This would probably require a simple pulley which would be suspended from a beam beneath the well house roof. Lastly, drainage in this area should be directed into a reconstructed version of the "Fur Trade Era Drain Trench" which runs in front of the Kitchen porch which fronts on the rear of the Great Hall.

The description of the well from the 1936-37 report on this site follows. It is of interest to note that no explanation can be had for the unusual "D" shape of the well opening. It is possible that the 4" x 4" timber found in the well fill once formed a part of the well house. Portions of it were painted the familiar "Spanish Brown."

"This unusual feature was found on October 15, 1937, but its true nature was not recognized for several days. It was situated 22 feet west of the northeast corner of the Great Hall and 11 feet north of the northern wall of this structure. The well opening was "D" shaped with the straight side of the "D" oriented to a true north-south direction. When completely excavated, its least diameter was 19½ inches; the greatest diameter, 27 inches. Total depth was 11 feet below ground surface (Figure 12).

The well's orifice was found about two feet below the ground surface in a heavy deposit of gray clay. A "D" shaped outline was formed by 10 vertical hand hewn boards. In the center of this outline was a fill of clay and flat stones which was difficult to remove. As excavation progressed, these boards were found to extend downward to a depth of about 8.8 feet below the ground level. The boards were about 9 inches in width and from 6.2 feet to 6.8 feet in length. They formed an exterior cribbing for the well and were held in place only by the wet clay which surrounded them. At a depth of about 8.8 feet, these boards rested on a wooden barrel lacking top or bottom. The barrel was about 24 inches in diameter and 27 inches in length. It was formed of 23 wooden staves. The bottom of the barrel rested on sand and gravel at the base of the wall.

Sitting on top of this barrel, and apparently inside the hand hewn vertical boards, were two other superimposed barrels also without tops or bottoms. The staves from these barrels had given way and stuck out irregularly into the well fill. As excavation

progressed downward, the staves from these two upper barrels were removed and labeled. The three superimposed barrels rose within the well to a height of about 7 feet 9 inches from the well bottom. The top of the uppermost barrel came within about 3 feet 3 inches from the ground surface.

The soil in the upper levels of the well was sandy; thereafter gray clay was found to a depth of about 8 feet, where it turned to a blue clay. Water had to be pumped out as the excavation was deepened into sand and gravel at the base of the well.

A number of objects were found in the well fill. Among them was a long stick $1\frac{1}{4}$ " in diameter and 66" in length; it extended vertically from about 4'6" from the ground surface to a depth of about 9'. One side of it was flat or a portion of its length and one end was pointed. It was apparently a building stake and of balsam or spruce. A timber, about 4" square and 47" long was also found extending vertically through the well fill. Its two ends were pointed and two sides were covered with a red or brown paint. Ralph D. Brown thought it might have been a decorative feature on the nearby "east gate." Also found within the well fill were a side and bottom of a wooden bucket. It was recovered at a depth of two to three feet about the well bottom. This bucket was covered with a reddish-brown paint which was probably the "Spanish Brown" mentioned in historical accounts as being used to paint the buildings of this depot. A symmetrical wooden device with a hole in it was found with this bucket. At the bottom of the well, on top of the sand and gravel, were found numerous wood chips, a single china sherd

and a shingle. The shingle had a weathered surface on it which was 4½" in length. This demonstrated that shingles used on the roofs of buildings at this site had a "weather surface" of this width.

The three wooden barrels found within the well had probably been used to carry provisions to the fur post, and when no longer needed, had their tops and bottoms knocked out and were used to crib the well. The bottom barrel, which was well preserved, was left in place. Thereafter, the entire excavation was filled with sand so that it could be easily re-excavated in the future." (Woolworth, 1963, pp. 111-113).

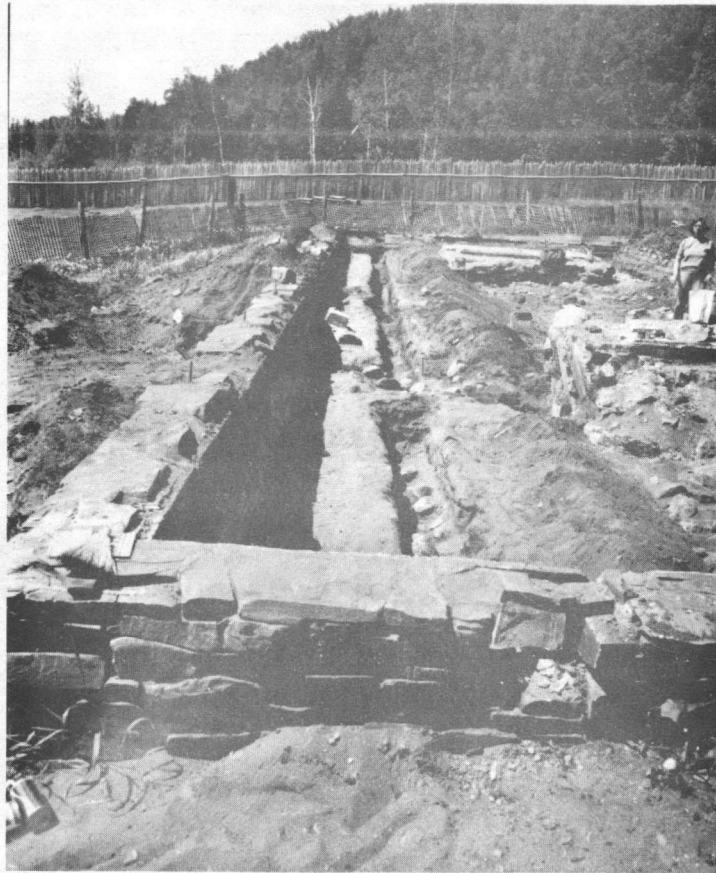


Figure 1: The Great Hall foundations, and an exploratory trench. View is West.



Figure 2: Exploratory trenches on the interior of the Great Hall Foundations. View is West.



Figure 3: Exposed foundations on the interior of the Great Hall.
View is East.

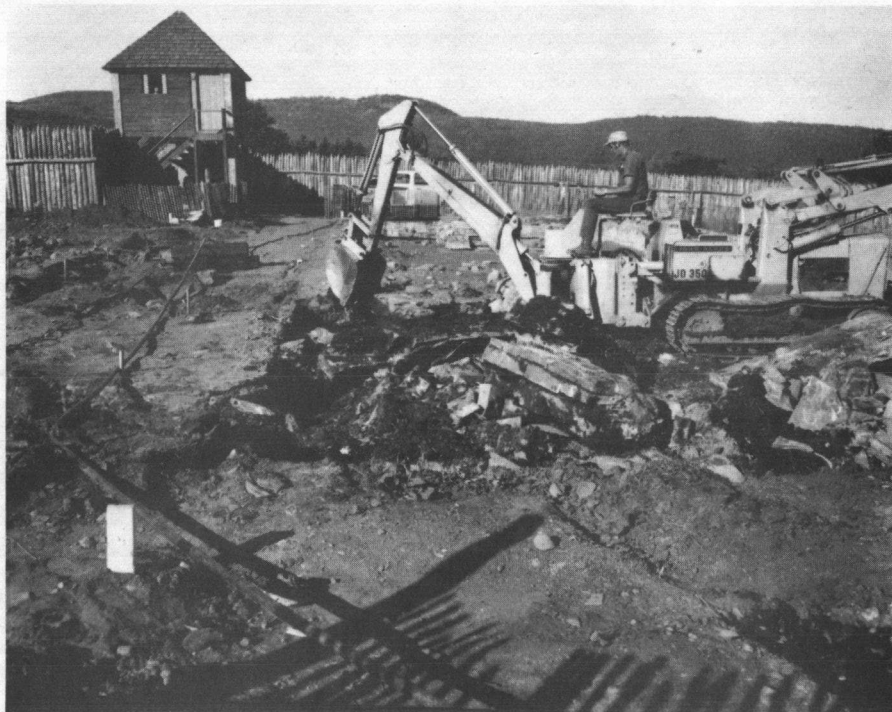


Figure 4: Removal of the Great Hall foundations.
View is East.



Figure 5: Crawford fox run, southeastern corner of the Great Hall.
View is Southeast.



Figure 6: Concrete marker base placed in front of the Great Hall in 1931.
View is North.

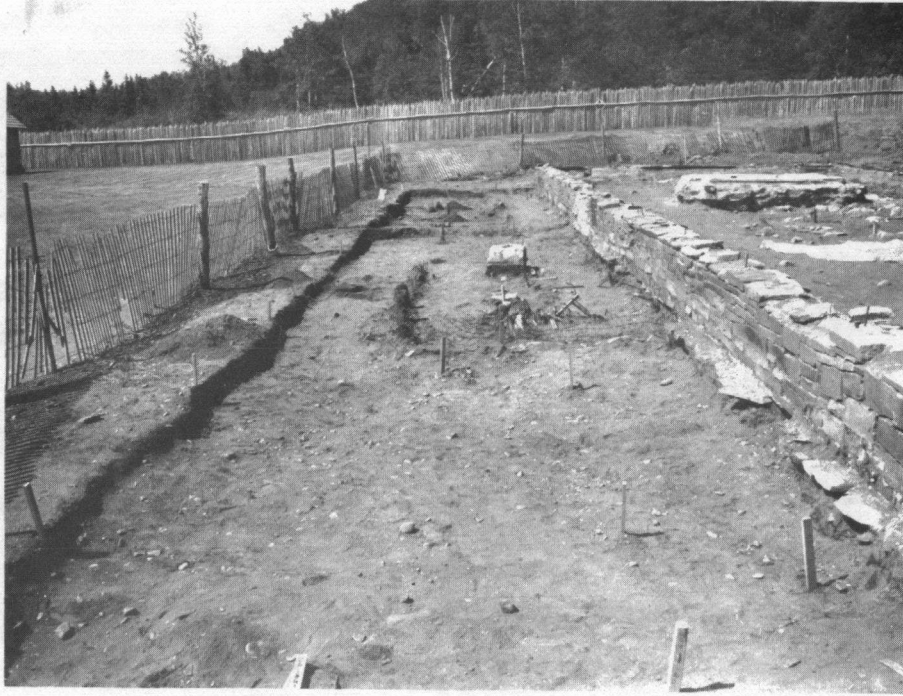


Figure 7: Excavations in front of the Great Hall. Wire fence from fox run in center. View is West.



Figure 8: Excavations in front of the Great Hall. View is East.



Figure 9: Stone-braced porch post in front of the Great Hall.



Figure 10: Profile view of a porch post in front of the Great Hall.



Figure 11: Stone-braced porch post in front of the Great Hall.



Figure 12: Fur trade era well located northeast of the Great Hall.



Figure 13: The outline of a fur trade era drain trench is shown by the lines of boulders. View is East.



Figure 14: The fur trade era drain trench from its eastern extremity. View is West.



Figure 15: Kitchen Structure. The unexcavated stone lined "Cooler".
View is Southeast.



Figure 16: Kitchen Structure. The Partially excavated "Cooler".
View is Southeast.



Figure:17: Kitchen Structure. The unexcavated stone lined fireplace.
View is Southeast.



Figure 18: Kitchen Structure. The excavated stone lined fireplace.
View is North.



Figure 19: Kitchen Structure. Eastern face of the fireplace. Note the courses of stone. View is West.



Figure 20: Kitchen Structure. Southern face of the fireplace. View is Northwest.



Figure 21: Kitchen Structure. Northern face of the fireplace.
View is East.



Figure 22: Kitchen Structure. General view of the excavated "Cooler" and fireplace.
View is Southeast.



Figure 23: Kitchen Structure. General view of initial excavations of this building in 1970, View is West.



Figure 24: Kitchen structure. General view of the completed excavations of this building in 1970. The fireplace and "Cooler" are in the right center. Other stones are natural. View is west.



Figure 25: Kitchen Structure. Shale slabs in the northwestern portion of this building in 1971. View is North.



Figure 26: Kitchen Structure. Shale slab surrounded by round stones. It served to support the southeastern corner of the building. Located at 20E-40N. From the 1971 excavations.



Figure 27: Kitchen Structure. General view of excavations in the western portion of the building in 1971. Exposed boulders are natural. View is North.



Figure 28: Kitchen Structure. General view of excavations in the eastern and central portions of the building in 1971. View is North.

IV.

ARTIFACT ANALYSISThe Artifacts

In the initial excavation phases, modern materials such as bottle caps, wire nails, and automobile parts were found. Obviously, much of this debris was from the 1937-40 excavation and reconstruction of the Great Hall.

Shortly, however, more promising artifacts were recovered. They were from the late eighteenth century and were mostly from the Kitchen structure. Most common of all were rose head nails. Approximately 2,500 of them were found. Also present, but far less common, were wood or metal working tools such as files, awls, drill bits, and pieces of wrought iron bar stock which had served as raw material at a forge. Recovered also were rivets, door and window hooks, staples, hinges and locks. These materials had all been used on the building or on its furnishings.

Relatively few materials directly associated with the fur trade were found. Perhaps the most significant of these were portions of several lead bale seals. More common by far were personal possessions such as firesteels, beads, buttons, buckles, tinkling cones of brass, and clay pipe stems and bowls.

Present, but relatively uncommon were firearm components such as lead balls, gun flints, and gun parts. Less common, but of much interest, were a few examples of native artifacts such as stone pipe fragments of the Micmac variety and a wooden net shuttle.

Cutlery, in the form of forks, knives, and spoons was well represented. Highly interesting were four brass cocks or faucets and six brass cock collars. As common as the nails were fragments of ceramic dishes which were found in earthenware, stoneware, and porcelain

forms. Fragments of glass from jars, beverage bottles, flavoring or medicine bottles, and drinking tumblers were present in large numbers.

Collectively, these artifacts reveal a surprisingly detailed picture of late eighteenth century life at a remote wilderness depot. In simplistic terms, they can be placed into four major classes-- building hardware and tools; personal possessions and trade materials; household goods and artifacts of native origins. Logically enough, these materials reflect the construction of the Kitchen building, some of its furnishings, and the cooking, eating, and drinking which went on within this building from about 1785 to 1802.

Figures which graphically depict the more interesting of the thousands of artifacts recovered at the site in 1970-1971 are placed after each textual discussion of a class of artifacts.

Almost fifteen thousand (14,758) artifacts were excavated and processed after the two field seasons of work on the Great Hall and the Kitchen buildings. A total of 14,441 items were recovered in or around the Kitchen. They are invaluable as direct, tangible links with the closing days of the North West Company's classic fur trade enterprise at Grand Portage. Their utility as guides for the furnishing of the Great Hall and its associated Kitchen cannot be measured in intrinsic terms of value. They will undoubtedly serve as the basis for many interpretive exhibits which will utilize three dimensional objects to tell aspects of this fascinating story.

MODERN MATERIALS FOUND IN OR NEAR THE GREAT HALL
(Figure 29)

Scissors (1) (No. 79). These are of a familiar household variety which could be used for hair cutting and miscellaneous light uses. They are not of great antiquity and measure 6" long by 2" in width, and are quite well made.

Brass Plaque (1) (No. 10). This unusual object is a brass name plate or plaque from a billiard or pool table. The inscription on it reads: "Manufactured / By / The J. M. Brunswick & Balke Co. / With The / (Eagle figure with outspread wings) / Monarch Cushion / New York, Cincinatti, Chicago, St. Louis, Detroit, Philadelphia, Buffalo, San Francisco / Pat'd. April 27, 1880". Obviously, a billiard or pool table must have made its way to remote Grand Portage sometime after 1880 and most probably in comparatively recent times. The plate measures 4" long by 1-5/8" wide and is 1/16" thick.

Cast Iron Latch (1) (No. 76). This object is of solid cast iron. At times latches of this type have been called "butterfly latches". Presumably, this is from their resemblance to a butterfly with outspread wings. Whatever the popular name, we know that latches of this style were used to fasten cupboard doors, or more commonly the screens on the exterior of a dwelling. This item appears to date from the late 19th or 20th Century. It is 2-1/2" long, 11/16" wide and has a countersunk central screw hole which is 1/4" in diameter.

Glazed Ceramic Bowl Fragment (1) (No. 20). This object bears a scroll type floral pattern on its scalloped border and large amounts of underglaze blue designs. Although only a portion of the design element

is visible, a sky with clouds can be discerned, and beneath it, what appears to be the chimneys of a number of buildings. Similar designs are very common from the late 19th Century period. The fragment is a portion of a small, but relatively deep bowl.

Small Steel Hinge (1) (No. 5). This small hinge is of the concealed butt variety and has one removable pin. On it is stamped: "Stanley, Made, USA". It is relatively recent and may well have been from one of the cupboards in the Great Hall. Dimensions are 2-1/2" x 2-1/2".

Aluminum Jar Lid (1) (No. 8). This item has the name "Watkins" embossed into its lid within an oval border. The lid is of a type which was used on cosmetic jars in the 1920's and 1930's. The Watkins firm has its base of operations at Winona, Minnesota. This lid is 2-13/16" in diameter and 1/2" in height.

Circular Iron Ring (1) (No. 84). This object is 4-1/2" in exterior diameter and has an inner diameter of 3". The metal ring which forms its general outline is 3/4" in width. The ring has three flanges on its exterior and a like number of smaller flanges on its interior. Each flange has a hole in it. This object appears to have been used for the suspension of a kerosene lamp and shade.

Clear Glass Bottle (1) (No. 67). This bottle has a capacity of approximately 1/2 pint. It is of a type commonly used for flavoring, extracts and medicines well into the 20th Century. It measures 2-1/4" wide by 6" high. On its base is the name: "Atlas".

Stove Door Ventilator (1) (No. 86). This is a portion of a cast iron stove door. On its top it has a grill with a slot for a knob to slide. This was used to move a small inner door to admit air into the stove for combustion purposes. On the lower portion of the door is the inscription: "Redwood/ Comstock-Castle/Stove Co./Quincy, Ill". The style of this door indicates that it was used on a wood cook stove of the late 19th or early 20th Century.

Collectively, these artifacts demonstrate the continuing use of the North West Company Depot area for home sites well into the 20th Century. The historical record, of course, shows that the local people lived on this site up to about 1936. These artifacts demonstrate almost the identical time span of occupation.

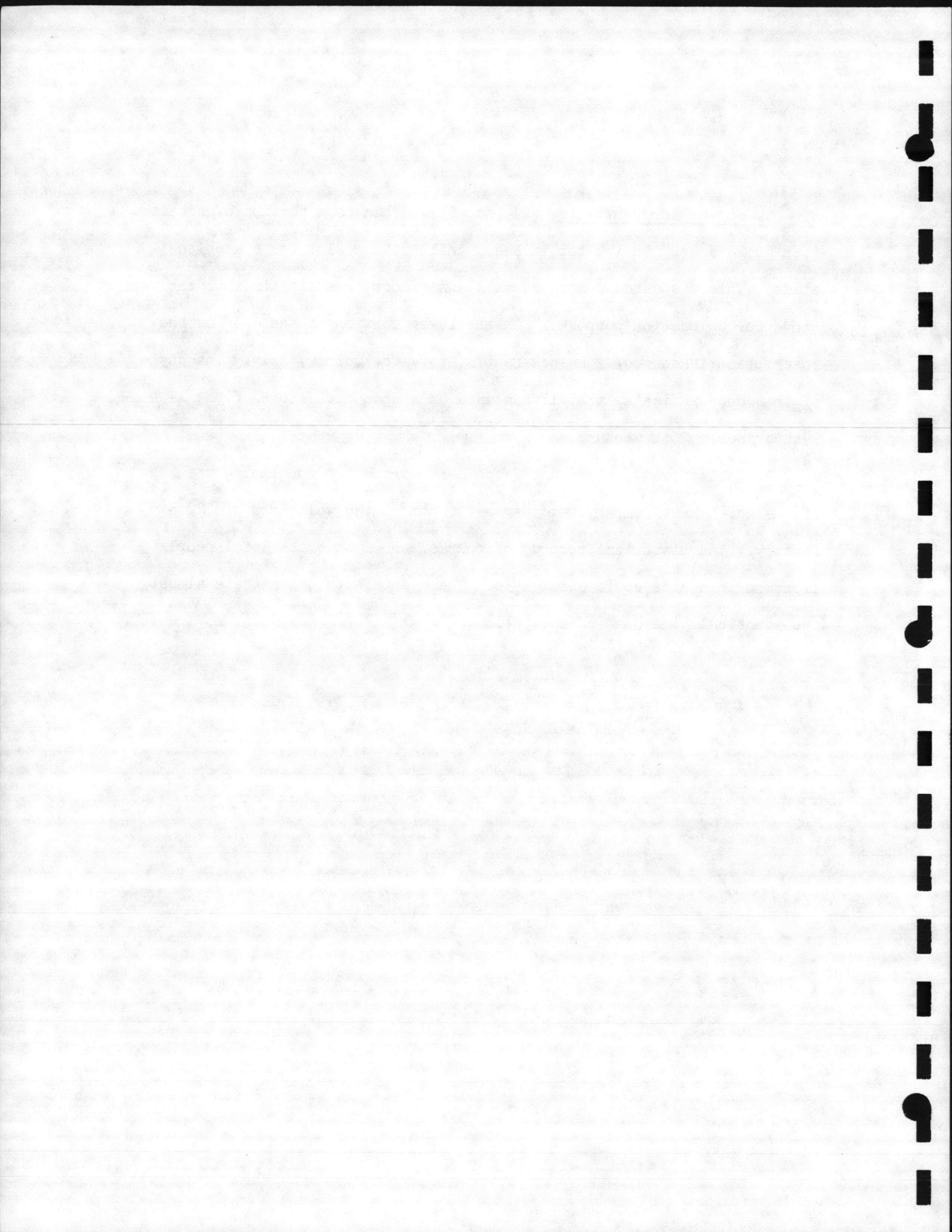




Figure 29
Modern Materials From In Front Of The Great Hall

- Item 1, No. 79. Household scissors.
- Item 2, No. 10. Brass name plate from a Brunswick billiard or pool table.
- Item 3, No. 76. Cast iron "butterfly" latch from a screen or storm window.
- Item 4, No. 20. Glazed ceramic bowl fragment; with underglaze blue design.
- Item 5, No. 5. Modern concealed butt cabinet hinge made by the Stanley Co.
- Item 6, No. 8. Aluminum jar lid with "Watkins" embossed on it.
- Item 7, No. 84. Circular iron ring; probably associated with hanging lamp.
- Item 8, No. 67. Clear glass flavoring, extract or medicine bottle.
- Item 9, No. 86. Stove door ventilator: "Redwood/Comstock-Castle/Stove Co./Quincy, Ill." inscription in raised letters.

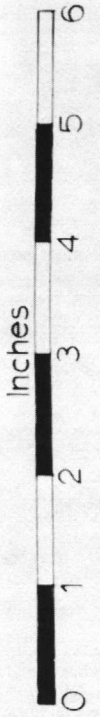
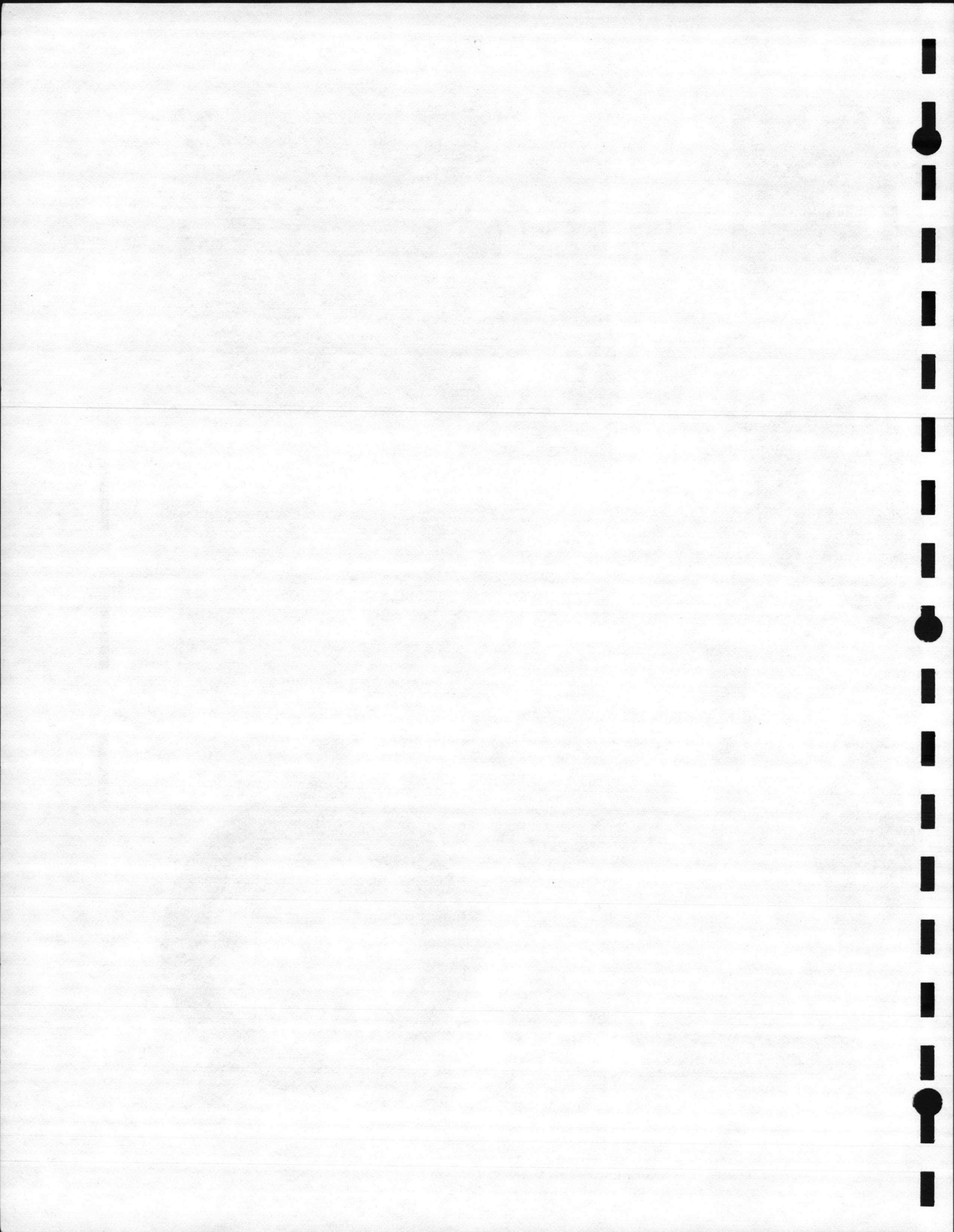


Figure 29: Modern Materials found in front of the Great Hall.



TOOLS
(Figure 30)

Files (9) (Nos. 1538, 1578, 677, 1855, 1579, 1745, 1797, 336-5-15 and 336-13-9). There are portions of four flat files in this assemblage. No. 1538 is the largest. It is 6-1/2" long, 7/8" wide and 3/16" thick. Its hafting end bears a conventional "tail" in the form of an isosceles triangle. Although the teeth are badly rusted, it appears to be a flat mill bastard file. No maker's mark is visible on the tang. This specimen would have, of course, been used for modifying metals. The second flat file No. 1578 is a smaller specimen. It measures 4-1/2" long, 5/8" wide and is slightly less than 1/8" thick. It bears regular rows of fine teeth and would have been used also for metals.

To the best of my knowledge, there is no convenient way in which to segregate files of the late 18th Century from more recent ones aside from trade marks and perhaps the degree of manufacturing skill used in making them. Two additional files in a fragmentary condition were found in the kitchen area in 1971. One of them is 13/16" in width, 3/16" thick, and 6-1/4" long. It has coarse diamond shaped teeth and a tang for attachment of a handle. The other file is 1" wide, 3/16" thick and 3" long. Its teeth are in diagonal and parallel rows. Both files have teeth which suit them for use on metals.

There are two portions of half round files. The largest of these, No. 677, is 4-3/8" long, 3/4" wide and 3/16" thick. In cross-section, it has the form of a flattened hemisphere. The file teeth are almost rusted away, but they appear to be relatively coarse. Presumably, this file would have been used for woodworking. The second half round file,

No. 1855, 1-7/8" long, 7/16" wide and slightly more than 1/16" thick. Its teeth are almost completely gone, but they appear to be of a hand made variety and medium coarse. Presumably, this tiny file would have been used for delicate work on organic materials such as wood.

There are portions of three round files. The largest of these, No. 1579, is represented by its tip and a tapered section which runs towards its center. At the end, it is 3/16" in diameter; at the central section, it is 3/16" in diameter. This specimen is 5" in length. There are regular rows of fine teeth which run around its circumference at a slight angle. This file could have been used for both metal and wood working. Present also is a segment of another file which may belong to the preceding one. This is No. 1797. It is likewise 3/8" in diameter, and is 2-1/2" in length. The third round file, No. 1745, consists of a four-sided tang and a one-inch long section of circular file shaft. It is 1/4" in diameter and 2" in length. The teeth are regular and of a fine cut. Most probably, this file was used for delicate metal work.

Scraper (1) (No. 1821). This unusual specimen is a section of iron pipe 7-1/2" long which is bent into a rough "S" shape with flattened ends. The ends were filed or ground smooth so that they were sharp. This tool seems to be made from a seamless piece of steel or iron tubing. Most probably, it is the remains of a fowling piece barrel which was adapted to a new purpose. It is likely that it was used for dressing animal hides.

Ball Peen Hammer Head (1) (No. 934). This represents the peen portion and a part of the eye of a small ball peen hammer. The peen portion is $3/4$ " in diameter and $7/8$ " in length. The eye for hafting the hammer is $7/8$ " high and $1-1/4$ " wide. It is possible that this tool is of no great age. In any event, it would have been used for sheet metal work or on items such as kettles, etc.

Handle Reinforcing Ring (1) (No. 360). This thin walled ring is $1-1/4$ " in diameter, 1" high, and $1/16$ " thick. Most probably, it served to reinforce a wooden handle of a chisel or some other tool which was struck with a hammer. It would have kept the handle from splitting.

Gimlets (3) (Nos. 553, 1673 and 336-1-27). These three specimens are alike in their general shape and appearance. Two are from $1/8$ " to $3/16$ " in diameter and are approximately 5" in length. One of them has an end which is flattened on two faces for insertion into a drill head. The other object is rounded at both ends. The third consists only of the drill tip. A portion is half round; the tip is threaded to start the bit. The other bit has a half round section which measures $1-1/2$ " long also. At one time, it appears to have had a screw tip on its point. Both edges of this tool are sharp. In use, it would have scooped out wood from a hole as it was rotated. Mercer describes their use (1960, p. 203) and Noël Hume illustrates one (1966, p.58).

Scribers or Scratch Awls. (Nos. 1226 and 1091). These tools, though somewhat different in size, are virtually identical in form. They measure approximately 5" in length, have rectangular shanks, and sharply pointed tips. Apparently, they were made from pieces of scrap iron and were sharpened into scribers or awl type tools.

Hold Fast (1) (No. 336). This object is much similar to those objects described immediately above, but has a right angled arm. In form, it has a rectangular cross-section that is $5/16$ " wide and $1/8$ " thick. It is $3-1/2$ " long and the right angled turn is $3/4$ " long. If this identification was correct, this object was inserted in a work bench and driven downwards to hold a piece of wood fast for shaping it. A number of devices of this nature are described in Ancient Carpenter's Tools, by Henry Mercer, 1960, p. 71.

Baling Needle (1) (No. 1103). This unique artifact was formed from a round rod of mild steel slightly more than $1/8$ " in diameter. It is 5" in length though incomplete. The "eye" end was hammered on both sides to flatten it. A rectangular eye which is $1/8$ " wide and $1/4$ " high was formed in this end. The long portion of the eye is in line with the longitudinal axis of the needle. The needle shank is round thereafter for a distance of $3-1/2$ ". The one and one half inches to the tip of the needle has been hammered into a diamond shape. Each of two sides have two facets of the diamond which are separated by a mid-line. Towards its end, the needle begins to curve toward a point. When complete, the needle tip most probably was rather curved for easy insertion into stiff fabric or leather which formed the outer covers of bales of trade goods. This needle could well have been used at Grand Portage to form bales of furs for shipment to Montreal. Similar specimens have been found at Michilimackinac, (Maxwell and Binford, 1961, p. 107 and Peterson, 1964, p. 47).

Spoke Shave Blade (No. 4). (No. 1463). This delicately made blade has a wedge shaped cross-section. At either end are ears which project upwards for a distance of one inch. The entire specimen is 4-3/8" long. The blade though badly rusted is 1/8" thick on its rear and sharp on the opposite face. In use, this specimen was mounted in a wooden handle which held the blade firmly. An open slot in the handle allowed the blade to protrude slightly so that it would make shallow cuts in wood. This tool would have been used to shape wooden tool handles, etc. (Mercer, 1960, pp. 97-98, 104).

Punch? (1) (No. 759). This piece of straight round wrought iron wire is .190" in diameter and approximately 5" in length. One end has been cut or sawn so that a sharp edge is present. The other end has been hammered and peened so that a lip has been created around the end of the wire. It is just possible that this piece of wire might have once served as a punch in light metal work.

Chisels(?) (2) (Nos. 467 & 336-3-18). This is a round piece of wrought iron wire which is .320" in diameter and 5-1/4" long. One end has been hammered and peened outward from repeated blows; the other end is cut into a chisel end with one 60° bevel and a flattened face on the other side. It is very possible that this artifact was used as a chisel for a short time though it is not tempered nor made for continual usage as such.

This may be the tip or point of a chisel. It is wedge shaped in cross-section and has obviously been forged from each side of the flat bar stock to form this edge. In form, it was once a piece of flat wrought iron 7/8" wide and 1/4" thick. It is 2" in length and has a chisel cut at a 45° angle which separated it from the rest of the tool.

Staple (1) (No. 719). One small wire staple was recovered. It is 7/16" wide and 15/16" long. It is made of round steel wire .065" in diameter. Perhaps it served to fasten a piece of fabric or a cord to a container. It is not large enough to have been used in a location requiring strength.

Chain Link (1) (No. 191). Only one chain link was found at this location. It is oval in outline measuring 1-1/8" in width by 3" in length. This link is made of wrought iron wire which is 3/16" in diameter. Its function is unknown, though it no doubt was used to either fasten something securely or to perhaps suspend some light weight object. It does not appear to have been strong enough for use around a fireplace to hold heavy pots.

Wrought Iron Pin (1) (No. 336-6-19). This pin consists of a cylindrical wrought iron shaft which is .740" in diameter and 7-1/2" in length. At its top is a dome-shaped or hemispherical head which is flared out to a diameter of 1-1/8". The laminar layers of wrought iron are clearly visible.

The use of this pin may have been associated with shipping, rafting of timber, a wagon, or perhaps even a fur press. Surely it must have been used on a piece of heavy equipment and was designed to withstand a great strain.

Cast Iron Wrench (1) (No. 336-6-18). This unusual object may not be of the fur trade era. It is basically a flat cast iron bar 1" wide, 1/4" thick and 4-3/4" long. One end of the bar is broken off through a centrally located hole which is 1/4" in diameter. The other

end of the bar is rounded and bears a dome-shaped area which is $1\text{-}1/8$ " in diameter. In it is a circular hole which is $5/8$ " in diameter. Opposite this hole, but on the flat side of the bar is a square hole that is $9/16$ " on a side. The function of this object is an open question. Perhaps it came from some late 19th or early 20th Century machinery.

Curved Wrought Iron Wire (2) (Nos. 336-2-15). Two pieces of curved wrought iron wire were found in close association with each other. They are $1/4$ " in diameter and $11\text{-}1/2$ " and $8\text{-}1/2$ " long. At one time, they were probably fastened together. The shorter piece has a flared area at one end which is $5/16$ " in diameter. The other piece has crude threading on one end as if another piece of metal had once been fitted onto it. When placed together, these pieces form an arc with $13\text{-}1/2$ " across its open face. It is possible that these segments of wire once formed the handle of a kettle or pail. More remote, but still possible, they could have been portions of a firearm ramrod. Yet, most ramrods of that era were of wood.

Round Iron Wire (8) (Nos. 577, 1104, 1105, 1251, 1423, 1674, 336-1-23, and 336-3-15). Most of these specimens are round iron wire; one is square. They range in diameter from .100 to .115" and vary in length between $5\text{-}1/2$ and 11 inches. The one square piece of wire is .140" on a side and is $3\text{-}3/8$ " in length. The functional use of these specimens is open to question. In some instances, wire has been found wrapped around bundles of files to hold them together in transit. Other uses might have been to fasten bales of trade goods such as blankets, though cordage would appear to be more probable for this usage. One short piece is .150 in diameter.

Iron Wire (1) (No. 336-6-20). Still another piece of iron wire is $3/16$ " in diameter and 7" in length. It is bent into the shape of a fish gaff, but appears to be of too light a wire for this purpose.

Keyhole Saw Blade (1) (No. 574). Possibly this tool may be of a relatively modern origin, but it came from the surface of the kitchen fireplace and was in a layer of wood ashes which kept it from rusting. This blade has a toothed portion which is broken and an enlarged segment which has a hole through it for attachment of a handle. It is evident that the blade portion has been broken off. Overall length is slightly more than 2". Thickness is less than $1/16$ ". Blade width is $3/8$ ", and the enlarged hafting segment is $5/8$ " in width. The teeth of this saw resemble rip saw teeth as they are raked to the rear. Each tooth, however, is set outwards from its predecessor. In this it resembles a cross cut saw. Thus, the blade would cut a wider kerf than a standard rip saw. It would cut, however, only on a pull stroke. A similar saw is depicted on p. 137 of With Hammer in Hand, Hummel, 1968.

Unidentified Objects (4) (Nos. 336-23-1, 617, 1354 and 1049). These unusual items are made of iron. They have the form of a right angle flange. The short arm is $5/8$ " wide and $1/2$ " long. The longer arm is 1" in length. In its center and lower portion is a rivet $1/8$ " in diameter and $1/4$ " long which extends through the center of the flange. Above the rivet, the flange flares out into two arms which diverge from each other. They are $3/16$ " wide and $5/8$ " long. The functional use of these objects is a complete mystery to me.

Of a puzzling nature is a wedge shaped piece of wrought iron,

No. 617. It is $1/8$ " thick and $1/4$ " wide at its narrow end and becomes thinner and wider towards the other end. At the opposite end it is $1/16$ " thick and $3/4$ " wide. A purposely made slit measuring $1/8$ " wide and $1/2$ " long is present in the narrower and thicker end. There can be no doubt but that this slit was intentionally made. Possibly, this artifact once served as the tip of a ramrod and at a later date was hammered out on one end into a chisel blade.

Equally, if not more puzzling is a small steel washer-like device, (No. 1354). This object is roughly circular or perhaps elliptical in outline. At one end is a square projection. The other end bears a larger and roughly square section which has apparently been broken off from a larger object. A scored line connects these two projections. In the center of the object is an oval hole which is $5/16$ " by $6/16$ ". Overall dimensions of the object are $9/16$ " by $3/4$ " and $1/8$ " thick. Its function is unclear.

Likewise unidentifiable is a rectangular piece of brass (No. 1049) which is $5/8$ " wide and $1-1/2$ " long. At one end is a thin, rectangular projection which is $3/16$ " wide and $1/4$ " long and $1/32$ " thick. The body of the rectangle is $1/32$ " thick at one end, but it gradually becomes thicker. At the opposite end, where the thin tab is found, it has increased to almost $1/8$ " in thickness. There are two equidistant holes in the rectangular plate. They are about $1/8$ " in diameter. One of them yet holds a fragment of an iron rosehead nail. Perhaps this unusual object once was on a wooden chest or cupboard.

Wrought Iron Bar Stock (6), (Nos. 336-3-17, 336-6-21, 336-25-17, 336-20-9, 336-3-18, 336-3-19). Most large scale fur posts or depots had blacksmith shops which contained stocks of iron and mild steel to be used for repairs or in fabricating new implements. Grand Portage is no exception, and over the years, a variety of pieces of wrought or laminated bar iron stock have been recovered from the site. A larger than normal collection was found in 1970-71. It is described hereafter.

The largest and most impressive piece is a square bar which measures 1" square and 7" in length. One end of this bar is slightly splayed from hammer blows. The other end has been cut, perhaps from a longer bar. The method of detachment is of much interest. Apparently, this bar was heated red hot and then placed on a "hardy" on an anvil. A deep angular cut 1/2" in depth was made; then the bar was turned 90° and a second, but shallow cut made. Lastly, a cut 1/4" in depth was made opposite the first cut, and the bar broken from the parent stock by being bent back and forth. This bar bears clear evidence of its forging as the laminar layers are readily seen. Weight: ca. 1-1/2 lbs.

A second piece of wrought iron bar is only roughly rectangular. One end of it is 3/4" by 1" and 3" in length. The remainder of the bar tapers to a rough point. Apparently, this was merely a piece of scrap discarded from a forge. Another piece of wrought iron bar is 5/8" by 3/4" and 2-3/8" long. A fourth piece is 1/2" by 1/2" or square and 2" long. Still another square piece is 5/16" by 3/8" and 2-1/4" long. The last piece of bar stock is rectangular. It is slightly more than 1/4" thick and 1-5/8" in width. It is wedge shaped and apparently

was cut from a larger piece of flat bar stock after being heated red hot. The cut is beveled at an approximate angle of 45° .

These pieces of randomly preserved scrap iron from a forge provide us with direct evidence as to some of the sizes of wrought iron kept in stock at the depot's blacksmith shop in the late 18th Century and to a lesser degree cast light on some of the methods of metal work there at this point in time. It would appear that among this stock were bars measuring: $5/16$ x $3/8$ ", $1/2$ " x $1/2$ ", $5/8$ " x $3/4$ ", $3/4$ " x 1", 1" x 1", and $1/4$ " x $1-5/8$ ".



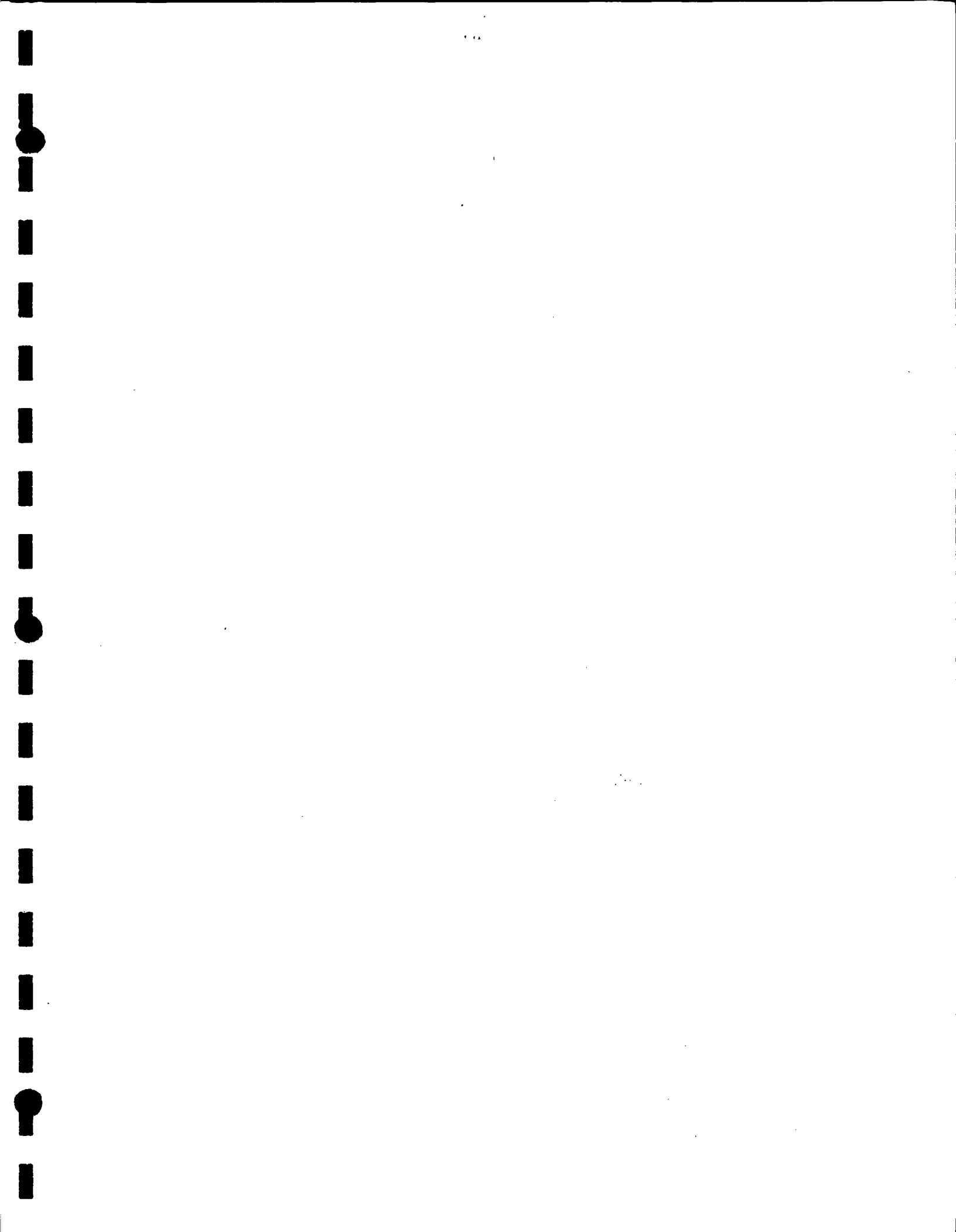


Figure 30

TOOLS: Files, Scratch Awls, Reinforcing Ring, Chisel, Spoke Shave, Hold Fast, Gimlet, Needle, Scraper, Hammer, Keyhole Saw and Wrought Iron Bars.

Items 1-5, Nos. 1538, 336-5-15, 1578, 677 and 1579. Files. Items 1-3 are flat; Item 4 is half round; Item 5 is circular.

Items 6 & 9, Nos. 1226 and 1091. Scratch awls.

Item 7, No. 336-23-1. Unidentified.

Item 8, No. 360. Wooden handle reinforcing ring.

Item 10, No. 467. Chisel made from a piece of 3/8" round iron.

Item 11, No. 1463. Spoke shave or draw knife blade.

Item 12, No. 336. Carpenter's hold fast for gripping wood on a bench.

Item 13, No. 1579. Gimlet bit for drilling holes in wood.

Item 14, No. 1103. Baling or sail cloth needle.

Item 15, No. 1821. Scraper made from a piece of tubing or fowling piece barrel.

Item 16, No. 934. Ball peen hammer head.

Item 17, No. 574. Keyhole saw blade.

Item 18, No. 336-3-17. Wrought iron bar stock 1/2" square.

Item 19, No. 336-20-9. Wrought iron bar stock 1/4" thick by 1-5/8" wide.

Item 20, No. 336-6-21. Wrought iron bar stock 1" square.

Item 21, No. 336-6-19. Wrought iron pin with round head. It is 3/4" in diameter.

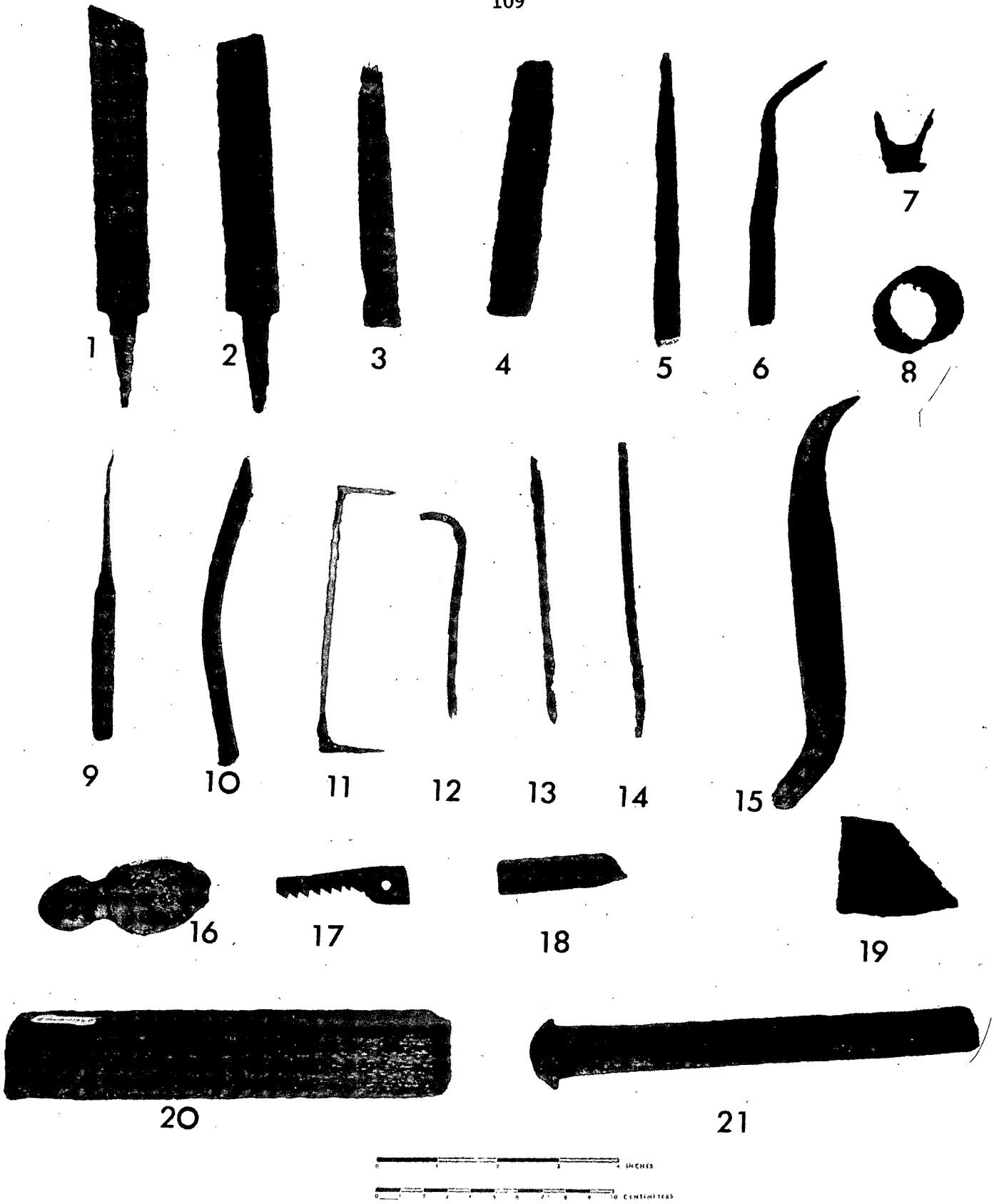


Figure 30: Tools. Files, Scraper, Hammer head, Handle reinforcing ring.



BUILDING HARDWARE
(Figure 31)

Rivets (6) (Nos. 1892, 1524, 234, 1066, 1343 and 1525). These familiar fastening devices bear a close resemblance to each other. All of them have small peened heads, square shanks, and square washers. The shanks range in thickness from 1/8" to 3/16" with most of them being 1/8" thick. In length, they are 1-3/4" and 2". It is probable that they were used to fasten the straps of wrought iron hinges to doors or cupboard doors as they are large for use on chests. (Mercer, 1960, p. 246).

Staples (4) (Nos. 267, 969, 1186 and 336-8-19). These specimens vary in size from a width of 3/4" and a length of 2" to 1-1/2" wide and 3-1/4" long. All of them are made of segments of flattened bar stock with square edges. All of them also appear to have been used as fastening devices. Most probably, the two larger staples were driven into door jambs and served as the fixed portions of a hook and staple or padlock and staple fastening device. One of these staples was obviously driven through a piece of wood about 2" in thickness and the ends then clinched to hold it tightly. The smaller staples may have been used to fasten cupboard doors or as window fasteners.

Nails and Spikes (ca. 1720 and 1150 fragments). By far the most common artifacts in most historic sites are iron nails. Grand Portage is not an exception. Although comparatively few nails were found at the site of the Great Hall, large numbers of them were recovered from the Kitchen building and adjacent to it. Presumably, these nails were used in the construction of this structure.

Characteristically, they were almost all of the rosehead variety. Nails of this type were hand made by a smith with a forge and often from prepared nail rods. When completed, the nail had a faceted or rose-head, a square shank and a sharp tapered point. Nails of this variety were commonly used for fastening flooring, wooden trim, roofing boards and other purposes in wooden buildings of the era. Less than one percent of these fastening devices were significantly different in form. A total of 5 clasp head nails were recovered. A similar number of chisel point nails were found. All of the others were rose-headed and with sharp points. A total of 1,154 fragmentary nails were found but were not measurable.

Set apart by their size were about 30 spikes. They are arbitrarily all nails greater than 5" in length. Most commonly, these too had rose-heads, square cross sections and sharp points. A few spikes have tent shaped heads, square shanks and chisel points. One spike had a rectangular shank and a massive square head. Nails and spikes are tabulated below:

TABLE 3

NAIL SIZES AND FREQUENCIES

<u>Size in inches</u>	<u>Number</u>	<u>Percent</u>	<u>Size in inches</u>	<u>Number</u>	<u>Percent</u>
1	3	.0017	4	130	.0757
1-1/4	9	.0052	4-1/4	6	.0035
1-1/2	493	.2869	4-1/2	9	.0052
1-3/4	15	.0009	4-3/4	0	
2	331	.1926	5	21	.0122
2-1/4	25	.0145	5-1/4	1	.0006
2-1/2	109	.0635	5-1/2	3	.0017
2-3/4	10	.0058	5-3/4	0	
3	453	.2637	6	3	.0017
3-1/4	25	.0145	6-1/4	0	
3-1/2	63	.0367	6-1/2	1	.0006
3-3/4	7	.0041			
				<u>1718</u>	<u>99.13%</u>

It is readily evident that there are 23 theoretical size ranges in this tabulation and that they are separated from each other by 1/4" increments. In actuality, there are only 20 sizes which are represented by specimens. Five of these sizes have more than 100 specimens. These are: 1-1/2 - 493, 2 - 331, 2-1/2 - 109, 3 - 453, and 4- 130. Their total is 1516 nails. Collectively, these comprise 88% of the sample of 1718 nails. If the 1,154 unmeasurable fragmentary nails are included, the tentative total number of nails rises to 2,872 specimens. Another observation is that almost one-third of the sample is 2 inches or less in length (851 specimens). Eighty-four percent of the sample (1448 nails) are three inches long or less.

Presumably, the nails of 2 inches in length or less would have been used to fasten flooring, roof sheathing, door and window casings and simple wooden furnishings such as tables and benches. The larger nails would have been used to fasten joists into sills, to hold door frames and similar structural members rigid.

Hooks (8) and Eyes (5) (Nos. 400, 634, 755, 949, 1092, 1093, 1356, 1418; 428, 1099, 1357, and 1422) The hooks readily fall into two types. A larger style has a round wire shaft which is 3/16" in diameter and are approximately 5-1/2 to 6" long. One end of it bears a circular loop which is 5/8 to 7/8" in diameter; the other has a hook which would have fitted into a staple or an eye. When in use, these objects would have been fastened to a window casing by an eye that was driven into wood. In my opinion, these hooks were used to fasten window shutters in an opened position. There are three of these large hooks.

A second type of hook is made from flat iron stock which is 3/16" thick. The five hooks of this variety have attachment loops at one end and hooks which are bent at a right angle from the shaft at the other. They are 1-1/2" - 3" in length. There are four eyes which appear to be associated with these hooks. These are likewise made from flat iron stock. On one end they have eyes which are approximately 1/2" in diameter. They are 2" in length and have sharp points. In use, these eyes were, of course, driven into a door casing and the hooks were fastened with eyes or staples to a door. Most probably, these smaller hooks and eyes were used on cupboards or small closet doors.

Caltrop(?) (1) (No. 1929). This unusual object bears a close resemblance to the Medieval devices of iron which had four sharp points and that were thrown on the ground to hinder cavalry. There are a few obscure and indefinite references in the literature to somewhat similar devices being used on palisades at fur posts. It is possible that this is such an item. This object has three sharp spikes and the broken off stub of what appears to be a fourth point. It is three inches in length. All points are 1-1/2" in length.

Hinges (5) (Nos. 438, 522, 847, 950 and 336-17-5). There are three types of hinges in this sample. Two examples are of the "butterfly" variety in which one leaf of the hinge resembles a butterfly's wing. At one end of it is a circular pin on which the other half of the hinge revolved. Each of these hinges once had three attachment holes through its body. The larger of the two has a tack 3/4" long in one of these

holes. Neither of these hinges could have served on a heavy door because of their slightness and the small nails used with them. One hinge measures 1-3/4" high by 2-1/2" long. The other is 3-1/4" long and 2" high. Hinges much similar to these are depicted on pp. 16 and 56 of Gentlemen on the Frontier, by Peterson.

Another type of hinge is represented by two specimens. These are lightly made hinges formed from a doubled thickness of sheet metal. One of them is formed from old kettle brass. It is 1-3/4" high and 2-1/8" long. It has four attachment holes crudely punched through it with a nail or awl and a cylindrical hole on one edge. A pin would have been passed through this hole and other matching holes on another hinge segment. The second hinge of this type was formed from two pieces of sheet iron. It is 1-1/2" wide and 2" long. One rosehead nail which is 1-5/8" long projects through an attachment hole in this hinge leaf. It measures 1" to a bend so it must have once been driven into a light piece of wood which measured about 1" in thickness. Both of these hinges must have been on small chests or boxes with lids (Armour, 1966, p.3).

Pintles (3) (Nos. 401, 698 and 1185). These right angled objects were one portion of a two piece hinge. In use, they were driven into a door jamb, and only the rounded upper arm protruded. An eyed strap hinge would be fastened onto a door and the door revolved around the upright short arm which was rounded for this purpose. Generally, pintles were used on rather large and massive doors. A typical pintle is 4-1/2" long, and 1" in height. The short arm is rounded and 5/16" in diameter.

The longer portion of the pintle is roughly rectangular and it tapers to a sharp point. In use, this object was obviously driven into a door post which measured approximately 2" thick. Its point was then bent over to prevent the pintle from working out in use. Another specimen is unique. It is 4-1/2" long and 2" high. It has the typical form of a right angle. The short arm is rounded and measures 3/16" in diameter. The shank or lower portion of the pintle is boat shaped. The end near the shorter arm is pointed. The longer portion which was driven into a drilled hole is tapered. Near its right angle, it is nearly 1/2" square. Towards its tip, it is reduced to approximately 1/4" square. The tip of the pintle for a distance of one-and one-half inches rearward from its point has been heavily scored with a chisel in a herringbone manner. This was to make it impossible for the pintle to work itself out backwards under the weight of a suspended door. There are six pairs of chisel marks on both the upper and lower faces of this pintle. It weighs 4 ounces.

The third pintle in this series is the smallest. It must have been used for a light weight cupboard or shutter type of door. It is 3" long and 1-1/8" high. Its upper arm is square and 3/16" on a face. The longer arm tapers to a sharp point.

Locks (2) (Nos. 1100 and 1420). The illustrated portion of a lock is only a fragment. It consists of a rectangular iron plate which is 3" by 4" and 1/16" thick. There are what appear to be two key holes in this plate. One of them is covered by a rectangular cover plate which

measures $9/16$ " wide by $2-3/8$ " long. It is riveted at the top and, of course, pivoted on this rivet. One keyhole is $5/16$ " wide and $3/4$ " high; the other is more rectangular and measures $3/8$ " by $7/8$ ". The function of this lock is open to question, but it might have been used on a trunk or chest. It is not a heavy duty type of lock suitable for use on a door.

The second lock is highly unusual. It is 2" long, $1\frac{1}{2}$ " high, and $9/16$ " thick at one end. This face bears a square hole $\frac{1}{4}$ " on a side which is for a bolt to slide through. The body of the lock is curved, and the entire lock is made of sheet iron about $1/16$ " thick. Similar locks were found at the site in 1936-37 (Woolworth, 1963, Plate 24). Ivor Noel Hume identifies this object as a "half heart" padlock of a type used in England about 1780 (Noel Hume, 1970, pp. 250-251). Other padlocks from the Kitchen Structure are described on page 171 of this report.

Miscellaneous Iron Objects (2) (Nos. 698 and 848). The larger of these two objects is incomplete and its function is unknown. Basically, it consists of a piece of iron which is $5/16$ " thick and $4-3/8$ " long and $1-1/8$ " wide. This segment has an elliptical appearance. At one end is a sharp point which tapers. It is 2" in length. The main body of the object has one complete hole punched through it which is square and $3/8$ " on a side. A portion of a second hole is at the broken end of this object. The function of this artifact is completely speculative. Perhaps it served as a type of clamp or reinforcing for a piece of wood. The second problematical object is a rectangular iron plate which measures

1-3/8" wide by 2-3/8" long. One end bears a rosehead nail 3" in length which is driven through a hole in the plate. The opposite end of the plate has a similar hole, but no nail, and is broken through the nail hole. The function of this object is likewise unknown.

Kettle Brass Flashing (6 pieces) (Nos. 336-3-14 (2), 336-8-17, 336-10-15, 336-12-18, 336-25-19). Although there are many pieces of flashing, they appear to combine into six major segments. It is readily apparent that flashing for perhaps a chimney in the kitchen structure was made from used kettle brass. One or more large brass kettles were cut into strips with a metal shears and the strips nailed along the outside of a chimney to weatherproof it. It is also possible that this flashing was used over a door or window as there are traces of a reddish-brown paint adhering to some of it. This may well be the elusive "Spanish Brown" paint which was used to decorate the building trim at this depot.

The strips of brass range in width from 2" to 4-3/4" with the majority of them being about 3-3/4" in width. Their collective length is approximately 66". In most instances, each piece of brass bears paired sets of nail holes near its outer margins. Usually, these are about 4" apart. One or two pieces of this flashing show signs of having been bent at right angles for insertion under shingles or a weather board. This highly unusual structural evidence indicates strongly that kettle brass was used for flashing on some components of perhaps the kitchen structure and may well offer conclusive proof as to the color of the "Spanish Brown" paint at this site.

Sheet Lead (1) (No. 1323). A strip of sheet lead of a roughly rectangular form was found at the site. One end is $7/8$ " wide, the other is $1-1/8$ " wide and it is 4" long and is slightly more than $1/8$ " thick. The surface of this strip is covered with a heavy layer of white lead carbonate. Despite this covering, it is possible to see a number of sharp knife marks which run parallel with its long axis. Other cut marks are not present. It is possible that this strip of lead came from a lead vessel, but more probable that it was cut from sheet lead which was used in the late 18th Century for flashing and a wide variety of purposes.

Brass Wire (3) (Nos. 196, 1220 and 336-2-14). Three small pieces of brass wire were found at the site in the 1970-71 field seasons. One unmodified piece is $.175$ " in diameter and $4-1/2$ " in length. Another piece was apparently used for a rivet. It is $.200$ " in diameter and 1" in length. Both ends have been peened to fasten the wire firmly around something such as a handle. The third specimen appears to have been a portion of a bracelet. It is oval, measuring $.175$ " x $.200$ " and is bent in a curve which is $1-1/2$ " long. Its sides are deliberately flattened.

Spanish Brown Paint Pigment

Minor research on the subject of the elusive "Spanish Brown" paint has established the fact that this had been a cheap but durable paint widely used in America during the eighteenth century. Earlier restorationists in the vicinity of St. Louis, Missouri had found that such a paint could be prepared from a clay like iron ore which was ground in oil by hand in a mortar and pestle. This produced a rich dark brown paint similar to the Spanish Brown used in the English colonies on the Atlantic Coast (Peterson, 1948, p. 73).

The strips of kettle brass bearing paint samples were examined by a staff member of the U.S. Bureau of Mines, Fort Snelling, Minnesota. The use of X-ray equipment and a powder camera revealed that this pigment was composed of hematite, quartz, and calcite (Leak, 5/16/1974). This correlates with the Munsell color 2.5 YR 3/6 or yellow-red, Chroma 6, Value 3 (Munsell, 1966).



Figure 31

BUILDING HARDWARE: Rivets, Staples, Nails, Hooks, Hinges, Pintles and Lock.

Items 1-2, Nos. 1892 and 1524. Handmade rivets probably used to fasten hinges.

Items 3, 5-12, Nos. 1116, 1344, 451, 1399, 578, 573, 450, 435 and 452.
Handmade nails. Most of them are of the rosehead variety, but Nos. 7 and 12 are tent headed and chisel pointed.

Items 4 and 17, Nos. 267 and 1186. Large staples of a type used on doors.

Items 13-15, Nos. 755, 400, 1356. Door and shutter hooks.

Item 16, No. 428. An eye used to fasten a hook or for a hook pivot.

Item 18, No. 1929. A probable caltrop used on top of palisade posts.

Items 19, 20, 23, 24 and 27, Nos. 874, 336-17-5, 438, 522 and 950. Hinges.
Nos. 19 and 20 are made from old kettle brass. Nos. 24 and 27 are of the "butterfly" variety used on cupboards and chests.

Items 21 and 22, Nos. 1185 and 401. Door pintles. No. 22 has been scored in a herringbone manner with a cold chisel.

Item 25, No. 698. An unidentified right angle shaped piece of steel.

Item 26, No. 1100. Portion of a large door lock.

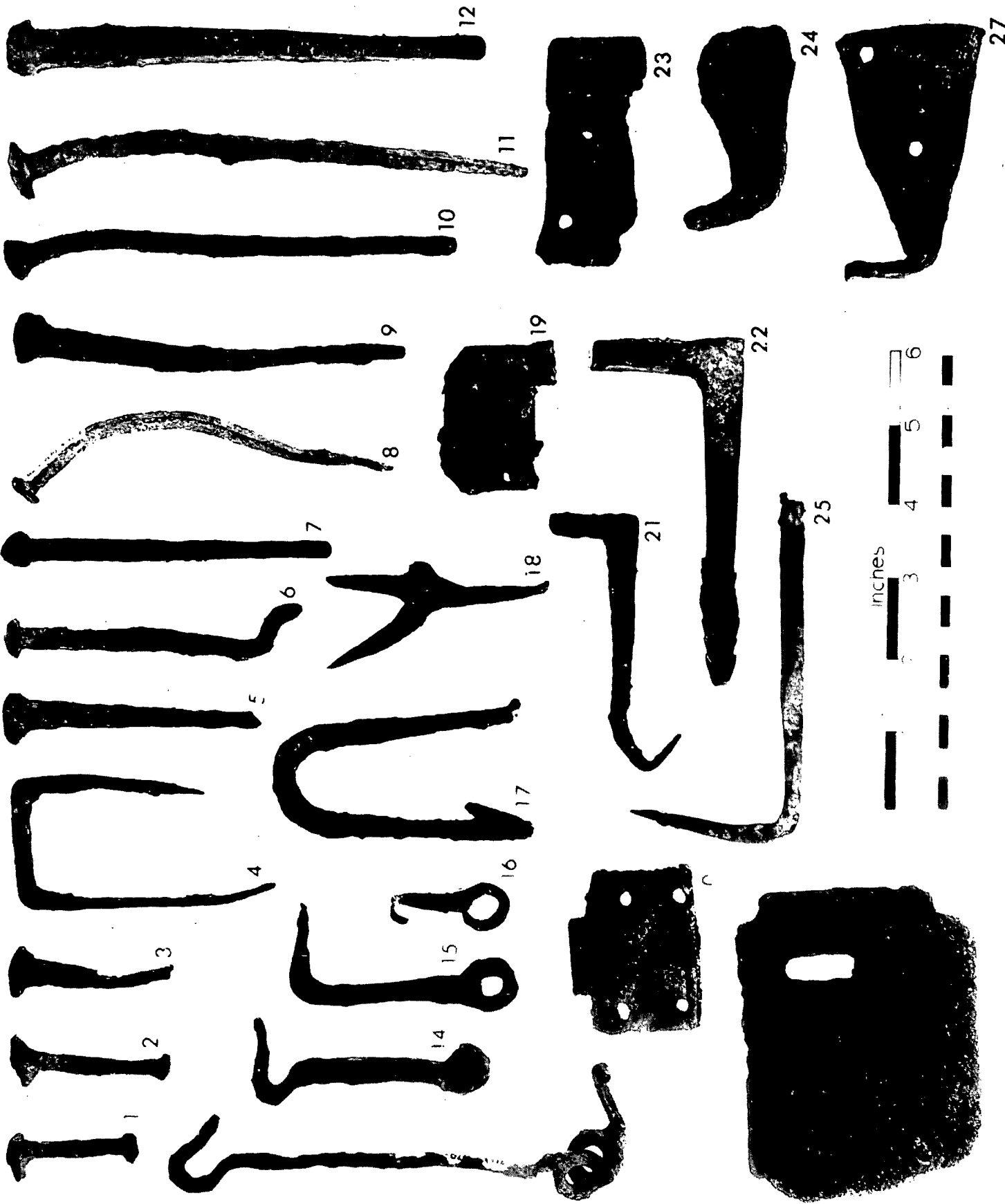


Figure 31: Building Hardware. Bolts, Nails, Hooks, Staples, Pintles, Hinges, and Lock Fragment.



TRADE GOODS
(Figure 32)

Firesteels (9) (Nos. 18, 19, 30, 292, 923, 1223, 1324, 1468 and 1520). There are two styles of firesteels in this sample. These are the oval form and the "D" shaped model. Only two of the oval type are illustrated in this report, but fragments of three others are present in the sample. There are four "D" shaped steels from these excavations. All of them are illustrated.

Characteristically, the oval shaped firesteels range from 2-3/4" to 3-1/2" in length and about 1-1/2" in width. Their steel outlines are 5/16" wide and about 3/32" in thickness. The "D" shaped steels are approximately 2-3/4" to 3-1/2" long and 1-3/4" in height. The striking bars on the "D" shaped steels range from 1/2" to 5/16" in width. They average slightly less than 1/8" in thickness. Generally speaking, the oval shaped steels are slightly less massive than the "D" shaped type, but the "D" shaped steels concentrate their steel in more massive striking platforms. The "D" shaped steels, of course, have slightly built sides and top segments. Often, the latter portions terminate in rolled finials. Even complete, these steels weigh less than an ounce.

In practical use, these utilitarian objects were almost priceless to the fur trade and its employees. With a steel, any hard piece of stone might be induced to make sparks and to ignite combustibles for heating or cooking. Apparently almost every male, Indian or white of that era carried a steel in his gear. In use, two or three fingers were thrust through the orifice in the implement and the steel was struck smartly against a piece of flint which produced sparks. The British

Government, for instance, made a practice of presenting one to almost every male Indian who visited its outposts. Thousands of them must have been given out each year (Quaife, 1937:36-41). Similar firesteels were found at the site in 1936-37 and 1963-64 (Woolworth, 1963, Plate 18; Woolworth, 1969, Plates 16 and 26). Others have been found at Michilimackinac and of an almost identical pattern (Maxwell and Binford, 1961, p. 110).

Bale Seals (4) (Nos. 426, 935, 1536 and 336-12-19). Items 3 and 5, Figure 32, were found together and presumably are parts of the same bale seal. Basically, bale seals consist of two circular lead disks which are attached to each other by a thin strap. One disk has a raised central stud. The other has a circular hole which would go around the stud. In use, the seal would be bent around the cordage on a bale of trade goods such as blankets. The circular hole would be slipped over the stud. Then they were struck with a steel die which contained a merchant's mark. This crimped and expanded the stud. Slightly raised letters were then visible on the central stud and often around the circumference of the seal. Obviously, the bale could not be opened without breaking the seal and leaving evidence of this act.

Generally, these seals are about 1-1/4" in diameter with the circular segment with the orifice being slightly smaller than that portion with the stud. They are about 1/16" thick and a complete seal would weight in the area of 1/2 ounce.

One seal in this series bears the letters "-SAAC -HIELD-".



Figure 32

TRADE GOODS: Firesteels and Bale Seals

Items 1-2, Nos. 1223 and 19. Oval firesteels.

Items 3-6, Nos. 1536, 935, 1536 and 426. Portions of lead bale seals.

Items 7-10, Nos. 18, 292, 30 and 923. "D" shaped firesteels. Nos. 7 and 10 have small finials at the ends of their upper portions.

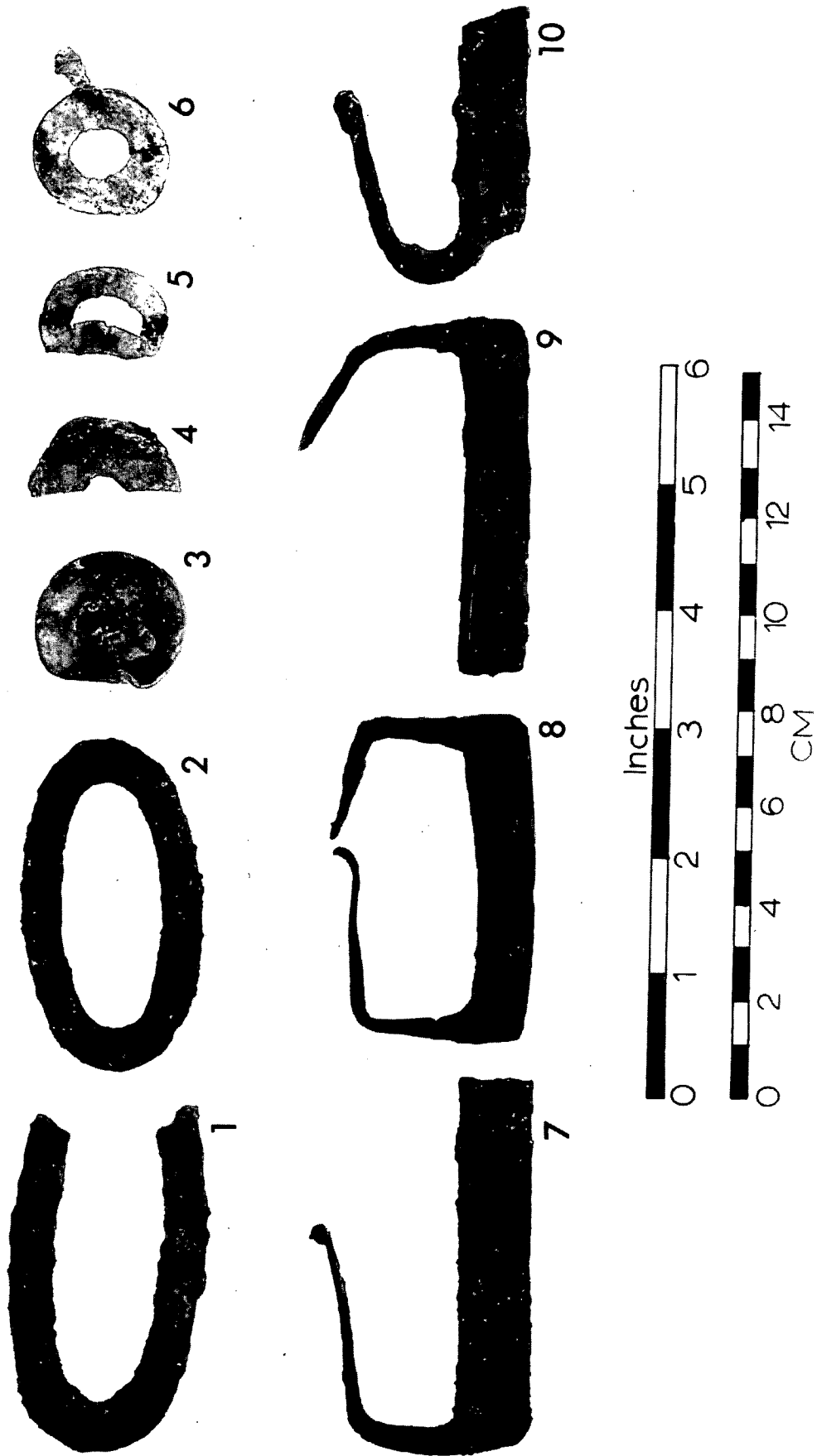


Figure 32: Trade Goods. Firesteels and Bale Seals.



Other and complete seals from the site bear an identical and complete inscription which reads: "ISAAC WHELDON/LONDON." Often cryptic numbers are found on the blank faces of such seals, but to date, they are not understood. As an example, this same seal bears these numerals: $\frac{48}{30}$.

Another seal consists of the portion which bears the raised boss. It is in a badly eroded condition and nothing can be read on its surface. This specimen is 1-1/4" in diameter and is slightly less than 1/16" thick.

A large quantity of bale seals from both the French and British periods has been found at Fort Michilimackinac (Maxwell and Binford, 1961, p. 89; Peterson, 1964, pp. 42, 62-65; Hume, 1970a, pp.269-271).

Beads

There are approximately 2,427 beads in the artifacts recovered from the site. The vast majority of them were found in or adjacent to the Kitchen structure. Generally, these beads are relatively simple in form, and can be classified as either tube beads (cylindrical) or wire wound (round or ovate). The classification system used here is that developed by Kenneth and Martha Kidd and published in 1970. Tube Beads, Class I are simple monochrome cylinders with straight ends. Beads of this type are hereafter described:

Tube Beads, Class I: One group in this series are small monochrome cylinders with straight ends. The majority of them are opaque. These measure from 3/32" to 1/4" in diameter, and from 1/8" to 1/4" in length. In this sample, there are 1 red, 135 white, 29 blue, and 8 black examples; the total is 173.

Medium sized monochrome cylinders with straight ends. These are opaque and translucent, but most of them are opaque. These measure $3/16''$ in diameter and $1/2''$ long. There are 2 white, 1 blue, and 4 black specimens in the sample, or a total of 7.

Large sized monochrome cylinders with straight ends. These are $1/4''$ in diameter and $3/4''$ to $1-7/8''$ in length, with rough, broken ends. There are 3 white and 1 black bead in this group. All are opaque and total 4.

Closely related to the above are Class Ib beads. These are simple cylinders with straight ends, but have added to them stripes of a different colored glass.

Small sized monochrome cylinders with overlaid stripes and with straight ends. These beads are of an opaque dark blue glass which is decorated with a series of thin, longitudinal white stripes. These beads are from $3/16''$ to $1/4''$ in diameter and average $1/2''$ in length. They total 4.

Small sized cylinders with rounded ends. Beads of this type form a large portion of the sample. They measure from $1/16'' \times 1/16''$ to $1/8'' \times 1/8''$ in size. All colors except the blue are opaque. Beads of that color are translucent. In this series, there are 69 red, 1139 white, 925 blue, and 8 black examples. They total 2,141.

Tube Beads, Class IIa. Originally, these were cylindrical in form, but they have been modified by being reheated and tumbled into spherical shapes. Most of this type are about $1/16''$ in diameter. All of them are opaque. There are 10 red, 10 white, 6 blue, 7 black, and 2 yellow beads of this type. They total 35.

Tube Beads, Class IIIa. These beads have cylindrical forms and straight ends, but they are composed of two layers of glass. The exterior coating is a glossy brown. The interior is a dark black color. They are $3/16$ " to $1/4$ " in diameter and from $1/2$ " to $7/8$ " in length. They total 10.

Wire Wound Beads, W1c. Beads of this type are handcrafted. Hence, it is difficult to generalize about them. The majority of the wire wound beads found here were plain in form and present in small, medium, and large sizes. The small beads are from $1/8$ " to $1/4$ " in diameter and $3/8$ " in length. They are present as follows: red 4, white 16, blue 6, black 2, and yellow 1, for a total of 29. The medium sized beads are in these colors: red 2, white 11, black 1, and yellow 1, for a total of 15. There is only one large wire wound bead. It is oval in form, opaque and measures $3/4$ " in diameter, $1-1/8$ " long, and has a centrally located hole that is $3/16$ " in diameter. It is of the "pigeon egg" variety.

Wire Wound Beads, W11a. This bead is oval with a foliage-like design inset into it. At one time, the inset was probably of another colored glass which contrasted with its background. The basic bead is made of an opaque, gold colored glass and is $3/8$ " in diameter by $3/8$ " in length.

Wire Wound Beads, W11c. These beads are oval with inlaid decorations. Two beads are black and have inlaid decorations of wavy white and blue lines. They measure $5/16$ " in diameter by $7/16$ " in length. Two other beads are also black and have inlaid sprigged decorations which resemble foliage. They measure $1/4$ " in diameter by $1/2$ " long.

The one bead of this type is made of a white, opaque material

with a glossy finish. At one time, it had three wavy lines of different colors inset into it. One of these lines was at either end, and the third line was in the middle. This bead is $5/16$ " in diameter and $1/2$ " in length.

This bead is formed of a translucent white glass and is decorated with an inlaid white circular dot which is surrounded by six blue dots of a smaller size. It is $1/2$ " in diameter and $7/8$ " in length. A second and incomplete bead of this same type is represented only by a split end (Kidd and Kidd, 1970, pp. 46-53).

There are 2,374 tube beads in the sample; and 53 wire wound beads. The bulk of them are small monochrome cylinders with rounded ends. The small tube beads predominate greatly as there are 2,353 of them, 17 medium sized ones, and only 4 large tube beads. In terms of color frequency in the tube beads, there are: 1,289 white, 965 blue, 80 red, 28 black, 10 brown, and 2 yellow.

In the wire wound group, there are 31 white, 7 black, 6 red, 6 blue, and 3 yellow examples. Color frequencies for the total sample of beads are: 1,320 white, 971 blue, 86 red, 35 black, 10 brown, and 5 yellow beads.

TABLE 4a

BEAD TYPES AND FREQUENCIES

Small	Medium	Large	Total
173	7	4	184
4			4
2141	10		2151
35			35
2353	17	4	2374

WIRE WOUND BEADS

29	15	1	45
	1		1
	4		4
	1		1
	2		2
29	23	1	53
2382	40	5	2427

TABLE 4b

BEAD COLOR FREQUENCIES

TUBE BEADS

Red	White	Blue	Black	Brown	Yellow	Total
1	135	29	8			173
	2	1	4			7
	3		1			4
		4				4
69	1139	925	8			2141
10	10	6	7		2	35
				10		10
80	1289	965	28	10	2	2374

WIRE WOUND BEADS

4	16	6	2		1	29
2	11		1		1	15
	1					1
					1	1
			4			4
	1					1
	2					2
6	31	6	7		3	53
86	1320	971	35	10	5	2427



Figure 33

TRADE GOODS: Beads

- Item 1. A strand of 39 small opaque red beads of a tubular form, but with rounded ends. Kidd's Tube Beads, Class II type.
- Item 2. A strand of 86 small opaque white beads of a tubular form, but with rounded ends. Kidd's Tube Beads Class II type.
- Item 3. A strand of 75 small translucent blue-green beads of a tubular form, but with rounded ends. Kidd's Tube Beads Class II type.
- Item 4. A strand of 10 small opaque black beads of a tubular form and with straight or sharp ends. Kidd's Tube Beads Class I type.
- Item 5. An assortment of several kinds of small beads. Present are blue-green tubular beads with rounded ends, opaque red tubular beads with rounded ends, opaque white tubular beads with rounded ends, and one opaque white wire wound bead.
- Item 6. A strand of 27 small opaque white beads of a tubular form, with straight ends. Kidd's Tube Beads Class I type. These bead diameters vary considerably.
- Item 7. An assortment of different colored tubular beads. Present are opaque black and white tubular beads with straight ends. Also present are four translucent blue tubular beads with straight ends. Also present is one opaque light blue tubular bead with straight ends. All fit into Kidd's Tube Beads Class I type.
- Item 8. A strand of four translucent blue tubular beads decorated with parallel white stripes. The stripes are merely surface decorations. Kidd's Tube Beads Class I type.
- Item 9. A strand of nine opaque tubular beads. Their surfaces are covered with a glossy brown finish. The bodies of the beads are formed of a black opaque glass. Kidd's Tube Beads Class III.
- Item 10. A strand of 12 opaque white wire wound beads of a barrel form. Spiral grooves show clearly on these specimens. Kidd's Wire Wound Bead type W1c; (Wire wound monochrome oval).
- Item 11. One semi-translucent wire wound glass bead which is decorated with a repeating pattern of inset small opaque beads which form a circular design. Kidd's Wire Wound Bead type W111c.
- Item 12. A large opaque white wire wound bead of the variety called "pigeon's egg". Kidd's Wire Wound Bead type W1c.



Figure 33 (contd)

TRADE GOODS: Beads

Item 13. A strand of 12 opaque wire wound beads of the "barrel bead" form. Four of them are smooth black barrel shaped beads. Two of them are opaque black and decorated with three wavy lines formed from white and blue glass, which are around their circumferences. One bead is opaque and white; it is decorated with blue-green decorations which resemble foliage. There are two opaque barrel shaped beads of a robin's egg blue. Two translucent barrel shaped red beads. One opaque white barrel bead decorated with wavy designs in a dark green color. All of these beads fall into Kidd's Wire Wound Bead types W1c and W11d.

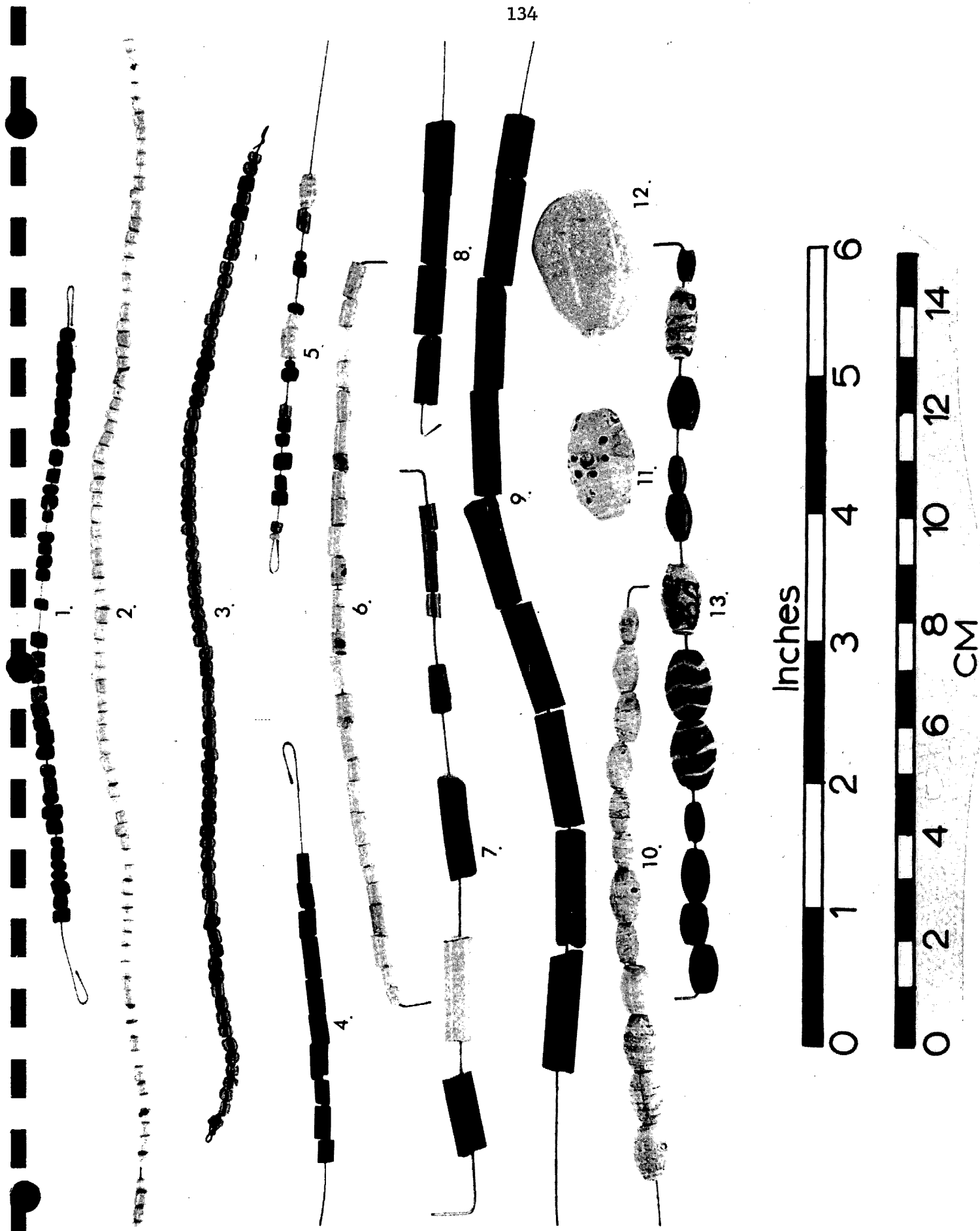


Figure 33: Trade Goods. Beads.



PERSONAL POSSESSIONS

(Figure 34)

Brooch (1) (No. 1687). This small heart shaped silver brooch is of the "Crown Over Heart" variety or that of the Scottish Luckenbooth brooches (Alberts, 1953, pp. 54-55). The brooch outline is formed of a continuous band of silver which is .093" in width and .030" thick. The brooch is 3/4" wide and 1-5/16" in height. No cross bar is present to fasten it to fabric. The edges of the silver band which outlines the brooch are smoothed so that the central portion of the band is slightly higher than the edges. The touch mark, "R.C." for Robert Cruickshank of Montreal is stamped into the center of the cross bar below the crown. This well known silversmith flourished between 1790 and 1809. His firm produced enormous quantities of silver ornaments for the Indian trade (Alberts, 1953, p. 26). Entirely separate from the brooch is a small scrap of silver (No. 1624) which was apparently cut from a bracelet or other ornament.

Buttons (8) (Nos. 615, 663, 664, 826, 990, 1382, 1747 and 1824). The bulk of these specimens are almost identical in appearance. Four examples are from 1/2" to 5/8" in diameter. They are all made from sheet brass and have plain, flat fronts and backs. Two of them have polished faces which appear to have been silver plated; two additional buttons appear to have been so heavily fired that only faint traces of what may have been gilding remain. All of them have simple wire eyes without feet soldered to their backs. In general, they conform to South's type 9 and to Olson's similar type G. The South dating is early as it averages

around 1750; the Olson dating is late as it ranges from 1785 to 1800. It is doubtful that either chronology is closely applicable to this sample. (South, 1964, pp. 113-133; Olson, 1963, pp. 551-554)

Two other similar buttons are also made from brass. They differ in that they have wire eyes which were cast into raised central bosses on the button backs. Then, the thick button was placed in a lathe chuck and spun, so that a tool cut the button to a standard thickness. One of these specimens is $5/8$ " thick; the other is 1" in diameter. These are South's type 7 and Olson's type D, 1760-1785.

An unusual button appears to be cast from pewter. It has two small attachment holes and is $3/8$ " in diameter. A button of this size could have been used on a shirt. The last button in this sample is of relatively modern origin. It is a two piece type with the front part being of brass and the rear of steel. The button is $5/8$ " in diameter and it has a central attachment hole which probably held a mounting stud at one time; this is $1/4$ " in diameter. On the front are the raised letters, "M.A./G B/ Kurstin". This is an overall button.

Metal buttons have a long ancestry in western Europe. At the end of the 17th Century, mohair and cloth buttons gave way to metal ones which remained in style until the close of the 18th Century. Button making began in Birmingham, England as early as 1685. This industry had 83 button makers in that city alone in 1770. A method of silver plating was developed in 1742 by Thomas Bolsover, who used his discovery

for decorating buttons. Gradually, the process was improved and about 1770 buttons were made more appealing. The button trade in Birmingham continued to flourish. In 1780, for instance, there were 104 button manufacturers in this city. This number increased to 188 by 1788, but began to decline towards the end of the century. In 1797, there were now 139 manufacturers in that center (Hamilton, 1967, pp. 131, 267-271; and Hume, 1970a, pp. 89-90).

Rivet (1) (No. 429). Similar in appearance to a button, but much different is a brass rivet. It consists of two flat disks which are permanently connected by a central stud. One portion of the rivet has a central shank $3/16$ " in diameter. This shank was passed through a washer hole of the second disk and then peened to permanently fasten the segments together. These components are separated from each other by a distance of $1/8$ ". In this space is a mass of red rust. Presumably, this object was once used to fasten two pieces of canvas, leather, or metal together.

Cast Brass Finials (3) (Nos. 1142, 1354 and 1564). These unusual objects are virtually identical aside from minute variations in size. All of them are cast brass cones which have centrally placed holes. The walls of these holes are threaded. Obviously, these finials were once fastened to metal rods with similar threads. All of them appear to have been sand cast. In size, they range from $7/8$ " to 1" in length and $5/16$ " to $3/8$ " in basal diameter. The orifices are $3/16$ " in diameter about $5/8$ " in depth. The functional usage of these objects is unclear. It may be that they are finials or decorative ends to a piece of equipment.

Candle Snuffer (1) (No. 614). This unique object is 1" in diameter and 2-1/2" in height; wall thickness is .060". This snuffer was apparently cast and then turned on a lathe as there are two pairs of turned lines 1" apart. The base of the cone has a rounded and outward flaring band 1/8" wide, a pair of incised lines 1/16" apart, are situated 1/2" above the base. One inch further up the cone are another pair of incised lines. Lastly, there is a turned and tapered finial at the apex of the snuffer which is 3/8" in height. This object weighs one ounce. Almost identical candle snuffers or extinguishers are depicted on page 163 of the British Army and Navy Association catalog of 1907. Customarily, they stood on a pedestal or were placed in a specific place on the edge of a candle holder. Their functional use led them to survive almost unchanged for at least a century and perhaps longer.

Mouth Harps (2) (Nos. 399 and 699). These musical implements are identical and complete aside from rusted out steel reeds. It is readily evident that both harps were cast in a mould and then filed to remove rough edges. These castings are square sided and taper from 1/8" on the ends of the arms to 1/4" on the arch. In form, these objects resemble an old fashioned hair pin with a curved base and two straight arms projecting from the bottom of the arch. In the center of each arch is a "U" shaped groove which held the base of the steel reed. Each harp is 1-1/16" wide at its widest portion and 2-5/16" long. They weigh .60 and .72 ounces respectively.

Ear Ornament (1) (No. 756). This is a hexagonally shaped "tinkler" with a closed base. It has the basic form of a tear drop, but with

flattened sides that form a wedge shaped apex. At its top is a small hole for attachment. This ornament measures $1/2$ " long and $1/4$ " wide at its base. Presumably, it was once sewn to a costume or served as part of an ear ornament. Perhaps it is an indication that an Indian woman lived or worked in the kitchen.

Triangular Pendant (1) (No. 427). This ornament was obviously cut from a larger silver item such as a bracelet or head band. There are two ridges on its upper portion which once served as decorations. It bears two holes which were punched through it with an awl point or with a sharp nail. One hole is in the top center; another and larger hole is in the bottom center. Perhaps these holes were used for sewing the ornament to a piece of cloth such as a headband or a dress. This item measures $3/4$ " wide by $7/8$ " high and is .013" thick.

Bone Toothbrush Base (1) (No. 1927). This object is a part of a tooth brush. It is rounded on one end and broken off on the other. This fragment bears three sets of parallel holes which were used for the attachment of the bristles. These holes are ca. $1/16$ " in diameter and do not extend all of the way through the bone. On the top or rear of the brush base are three parallel sawn kerfs which extend lengthwise along its long axis. These were used for sewing the bristles together in clumps. Although incomplete, this is direct evidence of efforts at personal cleanliness and grooming on the frontier during the late 18th Century. The fragment is $3/8$ " wide, $1-1/8$ " long and $1/8$ " thick.

Pendant (1) (No. 1296). This ornament of brass has the form of an acorn or nut. Originally, it had a wire suspension loop which is now broken off. The pendant has a generally ovoid cross-section but has eight somewhat flattened facets on its surface. It measures $7/16$ " in diameter and $9/16$ " in length; weight is .06 ounce.

Conical Tinklers (16) (Nos. 127, 589, 850, 1141, 1221, 1355, 1637 (8), and 1820). In general, all of these ornaments are of a similar appearance and size. They are, of course, simple scraps of sheet metal which were rolled into a conical shape around a tapered form. A thong or bit of cordage would be inserted through the smaller hole at the apex and the ornament then suspended from a dress or other costume. Thirteen of these objects are approximately $3/4$ " long and ca. $3/16$ " in diameter at their bases. These are apparently made of old kettle brass. The eight specimens numbered 1637 all have preserved hair or fur inside of them. No. 850 is made from a piece of rolled sheet silver. It is 1" long, $1/4$ " in diameter and .007" thick. No. 1820 is $1/4$ " in diameter at its base, $1-1/4$ " in length and made of sheet brass .032" thick.

In my opinion, these tinklers are firm evidence of the presence of native peoples, most probably women, who sometimes wore decorated costumes in the kitchen building. Further, it should be noted that eight of these ornaments were found together and that 12 of the 15 examples came from the extreme southwest corner of the kitchen structure. This is in a close proximity to the Fur Trade Era Drain Trench. Identical specimens were found at Michilimackinac (Maxwell and Binford, 1961, p. 111).

Writing Desk Clasp(?) (1) (No. 126). This object is either a portion of a clasp or a suspension device for a small dagger. Most probably it is a portion of a desk clasp. It has a roughly rectangular shape with a rounded elongation on one side. Opposite this projection is a hook shaped clasp. This object measures 1-1/8" by 1-3/16".

This artifact is made of cast brass. There are five attachment holes along the outer perimeter. Four of them are in the corners of the rectangle, the fifth is in the rounded projection opposite to the clasp. It is readily apparent that this clasp was fastened to another piece of metal because a small brass screw runs through the rear face of the object. The screw slot or kerf is in the rear. Therefore, the screw, which is only 3/16" long, was screwed through material about 1/8" thick and then into the plate. Possibly, a piece of leather was sandwiched between two metal plates.

Letter Opener Handle(?) (1) (No. 869). This unusual small object has a close resemblance to a table knife with a pistol grip handle. It is made of highly polished cast brass. Present only is the handle portion and a segment of the base of the blade. The handle is 1-1/2" long and 3/8" wide at the rear of the handle. The handle length is 1-1/4". Presumably, the blade was about the same length or a bit longer. The handle has been polished to a smooth finish. In front of it are two circular grooves. The base of the blade is wedge shaped and then tapers sharply to a rectangular shape. The blade is 3/16" wide and 1/16" thick. Presumably, the blade was about 2" in length. This could be a miniature letter opener; perhaps a pipe cleaning tool. (Hume, 1970a, pp. 310-311).

Pen Knife Blade (1) (No. 1052). This small steel knife blade measures 1-5/8" long and 3/16" wide. It has a wedge shaped cross-section and has been sharpened from both sides to a sharp edge. A bevel has been ground on the rear of the blade. The blade was broken off from its base in front of the tang or hinged pivot point. It has a spear shaped point and a "nail mark" or slot for opening the blade. In all likelihood, the blade is from a small one or two bladed pocket or pen knife. It could have been used for personal grooming and for splitting and sharpening writing quills. (Peterson, 1958, pp. 133, 139).

Shoe Buckles (3) (Nos. 37, 846 and 1072). One brass buckle is quite elaborate. In general, its outline is made of a rectangular flat casting which is decorated with a series of four parallel lines that form right angles at the corners of the buckle. In the center of each of the four sides of the buckle are identical foliage-like designs. The buckle has a thicker and arched center which fitted over a shoe instep. The steel pin which once ran through the arched center is absent. The casting that forms the buckle is 1/2" wide and 1/16" thick. The buckle itself is 2" wide and 2-3/4" long. It has a weight of 1.15 ounces.

A second buckle is more simple and less ornate. Likewise, it was cast in one piece of brass. The buckle outline is made of a casting which is arched on its top and flat on its underside. This casting is 1/4" wide and 1/8" thick. The buckle is 2-1/4" wide and 3-1/8" long. Its top is rounded to form an arch to go over the instep of a shoe. In the top center of the arch are two holes about 1/16" in diameter. A steel pin once passed through them and under a shoe tongue. Weight: 1.20 ounces. Another fragmentary buckle decorated with dots and open slits was also found.

Buckle Fasteners (2) (Nos. 37 and 991). This object consists of a central pivot, two arms on a lower portion and two tines which project upward from the pivot bar. This is the working portion of a buckle in that it presses the fabric or leather of a strap against the buckle frame and holds it fast. In detail, this object consists of a rounded iron shaft which is $1/8$ " in diameter and 2" long. Its ends are recessed for fitting into slots in the buckle frame and serve as pivot points. In the center and on top of this rounded bar are two sharp wire prongs. They resemble the tines of a two-tined fork and would have kept the fabric of a strap against the stationary part of the buckle frame. On the lower side of the rounded bar or axle are two flat, curved bars. They appear to have served as a guide for the strap which was inserted into the buckle. The overall dimensions are $2-7/8$ " by 2". It must have fitted into a buckle which had inside dimensions of 2" by $2-1/2$ ". No doubt the frame of the buckle would have measured in the area of $2-1/2$ " wide by $3-1/2$ " high, which is in the range of shoe buckle sizes. Another and very fragmentary buckle fastener was also found here.

Buckle (1) (No. 193). This miniature buckle has a rectangular shape. It is $9/16$ " in width and $10/16$ " in length. The body is made of brass and the buckle is complete, including the fastener which consists of two sharp prongs that revolve on a central bar. It bears a rather close resemblance to the much larger shoe buckles. Most probably, it was used on knee breeches and served to fasten them together.

The manufacture of metal shoe buckles was well established in Birmingham, England by 1686. In the earlier years of manufacture, casting appears to have been the preferred method of manufacture. By about 1770, there were 44 buckle makers in this city. Shortly after this date, a stamping process had been developed which used elaborate male and female dies under pressure to mass produce buckles.

A great proportion of the buckle trade depended upon fashion and taste which fluctuated. Birmingham for instance had a flourishing business as long as people wore shoe buckles. Towards the end of the 18th Century, fashion changed and shoe strings took the place of buckles. Consequently, the trade suffered severely. Buckle manufacturers in Birmingham, Walsall and Wolverhampton petitioned the Prince of Wales to aid them and he promised to set an example by continuing to wear buckles, but he was of little help. Even as late as 1812, the buckle makers were striving to recapture the popular taste by persuading prominent Birmingham families to wear buckles. Unfortunately, fashion could not be dictated so easily (Hamilton, 1967, pp. 266, 268, 301-302; Hume, 1970a, pp. 84-88).

A considerable number and variety of shoe buckles have been recovered at Grand Portage during the various excavations (Woolworth, 1963, Plate 19 and Woolworth, 1969, Plate 12). Large quantities of these buckles have also been found at Michilimackinac which was abandoned in 1781 when buckles were yet highly fashionable (Peterson, 1964, p. 36). It is probable that shoe buckles declined swiftly in popularity about

the time of the French Revolution (1789) and that their usage at Grand Portage ceased a few years later, by perhaps 1795. This is speculation, however, it is doubtful that these artifacts will ever be precisely dated at this site. Still, it is of considerable interest to recover these items and to have visual proof of a European fashion in the wilderness during the late 18th Century.

Wire Ornament (1) (?) (No. 457). This unique object was formed from square copper wire which is 1/8" on a side. Overall length of the wire is 10". In form, it is either a script "W" or an "M". The function of this item may have been purely decorative or the result of a spare time "doodle" with an available piece of easily formed wire. It is to date the only recovered piece of square copper wire found at the site. Weight: .52 ounces.

Trade Clay Pipes (46 bowls, 841 stem fragments, and 86 bowl fragments). An analysis of the bowls and associated spurs demonstrates that there are at least 46 pipes represented in this sample. Of this number, 6 spurs or bowls are marked with the letters, "G/W"; 16 spurs or bowls are marked with the letters, "T/D", 1 bowl is marked with block letters which end in an "M"; and 24 spurs or bowls either had no markings, the markings were illegible, or no spurs were present. Hence, it is evident that the "T/D" markings are most common on the marked pipes from this sample. Also, quite evident was that many of these pipe bowls either had no spurs or that they had been removed and the areas smoothed over by their owners.

A study of the stem fragments demonstrates that there were 421 stems with $4/64$ ", 408 stems with $5/64$ ", and 12 stems with $6/64$ " diameter bores. These average out to a date of 1759 which is obviously too early; perhaps about 25-30 years early. A distribution study reveals that large numbers of these stems were found in front of the kitchen building in the area of the Fur Trade Era Drain Trench. It is probable that smokers sat on a porch or the ground in front of the building to smoke.

Most of the "TD" pipes in this sample bear these letters within a circle which is on that portion of the bowl which faces the smoker. This circle is composed of short lines and is $1/2$ " in diameter. Within the circle and over the letters, TD is a design with three small circles which are flanked by two short wavy lines. A similar device, but with three small circles in the form of a triangle and bordered by two wavy lines is beneath these letters (Peterson, 1963, pp. 1-8).

Marble (1) (No. 1653). This broken marble is made of fired clay. It is presumably of European manufacture and $3/4$ " in diameter. There is no trace of a glaze on its surface.

Figure 34

PERSONAL POSSESSIONS: Silver brooch, Metal Buttons, Candle Snuffer, Shoe Buckles, Conical Tinklers, Wire Ornament, Jew's Harps, and Clay Pipes.

- Item 1, No. 1687. Silver Luckenbooth Brooch.
- Items 2-8, Nos. 664, 429, 990, 663, 615, 1747 and 1382. Brass buttons.
- Items 9 and 10, Nos. 1354 and 1564. Cast brass finials of unknown usage.
- Item 11, No. 614. Cast brass candle snuffer.
- Item 12, No. 37. Shoe buckle fastener.
- Item 13, No. 126. Brass clasp for a writing desk or ledger.
- Item 14, No. 869. Brass handle for a pipe tool or miniature paper knife.
- Item 15, No. 1052. Steel pen knife blade.
- Item 16, No. 756. Silver ear ornament or "tinkler".
- Item 17, No. 427. Sheet silver ornament made from a bracelet or headband.
- Item 18, No. 1927. Bone toothbrush base.
- Item 19, No. 1296. Brass pendant.
- Item 20, No. 1653. Ceramic marble.
- Item 21, No. 457. Ornament in the shape of an "M" or "W" made from square brass wire.
- Items 23-35, Nos. 1820, 1632, 1637(7), 1221, 1355, 1141 and 850. Conical metal tinklers. Item No. 35 is of sheet silver.
- Items 36 and 46, Nos. 846 and 37. Cast brass shoe buckles.
- Items 37 and 38, Nos. 945 and 260. Cylindrical opaque porcelain beads.
- Items 39 and 40, Nos. 699 and 399. Cast brass Jew's harps or mouth harps.
- Items 41-45, Nos. 1808, 1402, 418, 336-11-6 and 1810. Trade clay pipe bowls.

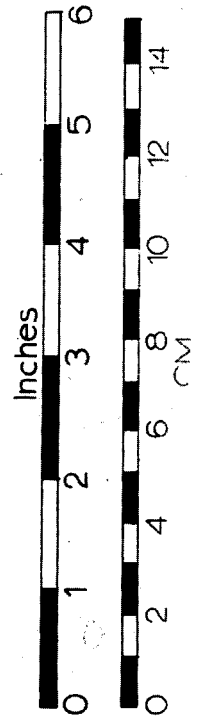
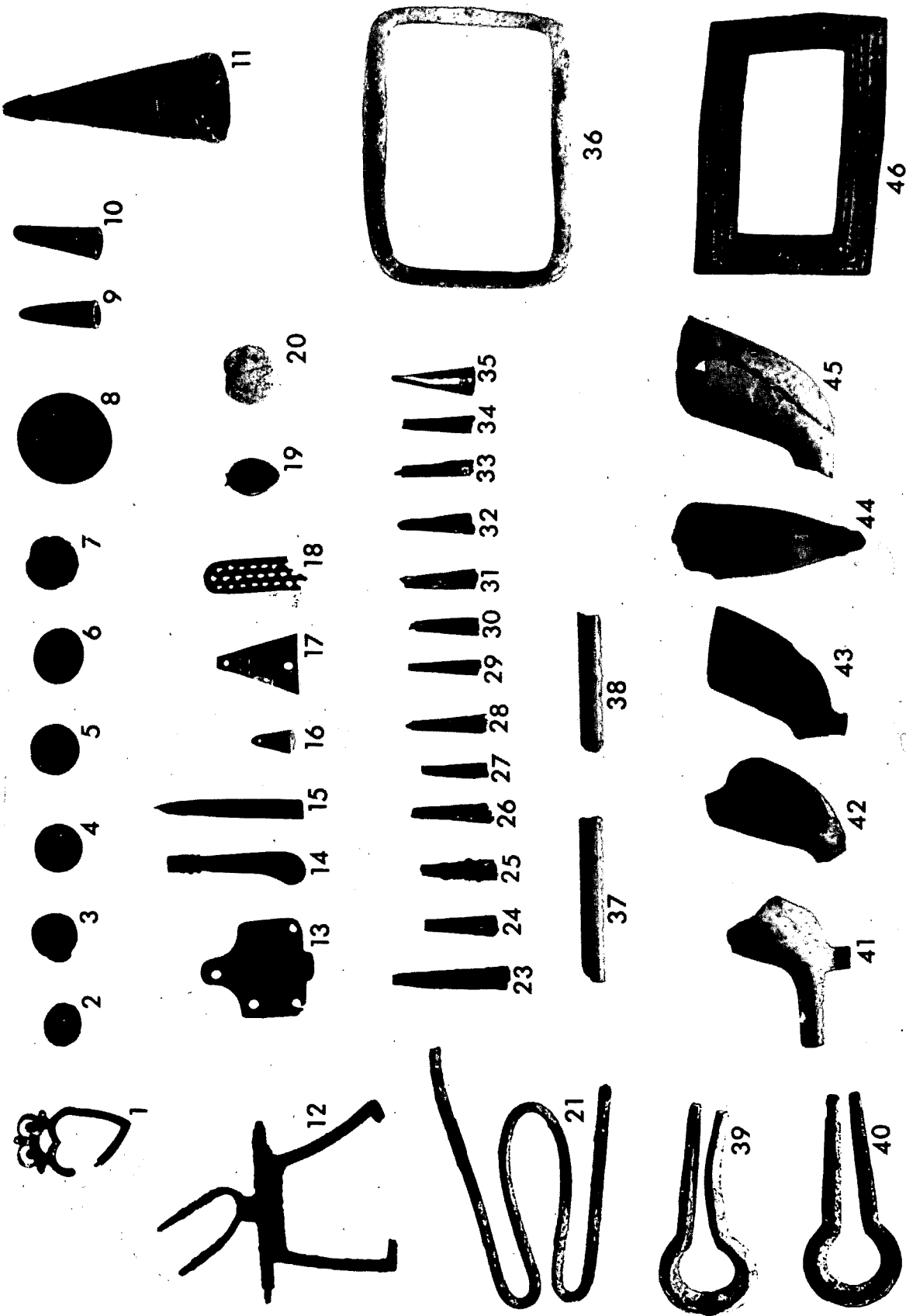


Figure 34: Personal Possessions. Buttons, Tinklers, Mouth Harps, Shoe Buckles, and Clay Pipes.



FIREARMS COMPONENTS

(Figure 35)

Gunflints (15) (Nos. 38, 146, 384, 441, 552(2), 662, 678, 700, 733, 734, 808, 1269, 1490 and 1877). The majority of these specimens, or perhaps all of them, are of English manufacture. They range from gray to black in color with the exception of one specimen which is a light beeswax brown. In shape, they are square or rectangular with four sharp corners. Some specialists would refer to their cross sectional form which was once prismatic with sharply beveled faces on three sides and the fourth side or striking face has a gradual slope which runs from the prism angle to an abrupt and sharp edge. Interestingly enough, the three relatively complete specimens have minute retouch flakes on the underside of the striking face. One single flint in this group is aberrant in form and color. It has a rounded or "gnawed" rear, thin, straight sides and a straight striking face. It is of the "gun spall" variety with a pronounced bulb of percussion. In color, it resembles banded Lake Superior agate. Although unusual, it may be merely a poor quality English flint or even locally made from readily available materials (Hamilton, 1964, pp. 52-57).

Six of these flints appear to have been used in trade guns with medium sized locks. When measurable, they range between 20 x 25mm. to 22 x 27mm. The unusual specimen with the rounded heel is 20 x 24mm. A very small flint with a rectangular form and of a beeswax brown color is 17 x 19mm. It is of a size suitable for a rifle or fowling piece with a small lock.

Thirteen of these gun flints were badly worn from use and were discarded. Four of them appear to have been thrown into hot ashes or into a fire. In most instances, these flints had been turned in the hammer vise and used on all faces. Little was left of them except for their thick cores. Their condition and presence at this structure demonstrates that at least some of the fur trade employees hunted for the pot, and perhaps for sport. It is also possible that they represent off season use and occupancy of the Kitchen building by permanent depot personnel who hunted to supplement their standard, but preserved fare.

Lead Bar (1) (No. 25B). This object is rectangular in form with a rounded top and a slightly concave base. It has a general resemblance to a modern loaf of bread. In its center is a hole which was drilled from the base to the top. At the base, the hole is approximately 1/8" in diameter. At the top, it is 1/16" in diameter. This piece of lead was perhaps cast locally for use as a net sinker or for depth fishing. It measures 1-1/4" long, 5/8" wide and 5/8" high. It weighs 2.65 ounces. Indeed, it may not be from the late 18th Century fur trade period as it was recovered from in front of the Great Hall near the Fox Run.

Flintlock Vise Screw (1) (No. 25). This artifact has a rounded head with a sawn slit, a constricted neck, a flared collar and a tapered segment which is threaded. It is 1-1/2" long, 3/8" in diameter at the head and 1/4" in diameter on the threaded portion. When used, it served to clamp the two vise segments of the flintlock hammer together around gunflints of varying thicknesses. The slit in the top allowed a screw

driver, or perhaps a knife blade to be used to revolve the screw. In all probability, it was used on a firearm with a small or medium sized lock.

Flintlock Vice Jaw (1) (No. 233). This object has a roughly circular form and in its center is a rectangular slot. The disk is about 1-1/8" in diameter and the slot is 1/4" by 3/8". It is badly rusted and impossible to determine its original thickness. This could also be a washer from a knife handle.

Brass Side Plate (1) (No. 1491). This unusual object is a part of the "furniture" or hardware which was once used to decorate an 18th Century firearm. Though incomplete, it measures 3-1/2" long and 1" wide at its widest point. At either end of it are partial screw sockets. These once served to hold screw heads while the threaded portions of the screws passed through the wooden stock and into the lock plate on the opposite side of the weapon. In terms of design, this object resembles cheaply made brass mountings on English fowling pieces of the late 18th Century. It appears to have some affinities with T. M. Hamilton's Type J firearm (Hamilton, 1968, pp. 19-20).

Flintlock Hammer (1) (No. 336-10-22). This specimen is of the familiar English late 18th Century "cock" style. It is complete with upper and lower vise jaws and a round headed vise screw. In form, it has flat vise jaws, with chamfered edges, a sharply curved neck and a step on the front face of the comb which acted as a fulcrum for the upper jaw of the flint vise. It is 3" high and 1" in width at its widest part.

The base of the cock is rounded and the hole by which the cock was mounted to the firearm is square. It is probable that this item was a component of a rifle or fowling piece with a small lock. It closely resembles cocks illustrated on page 165 of T. M. Hamilton's, Indian Trade Guns, 1960.

Spherical Lead Balls (8) (Nos. 833, 872(2), 1047, 1549, 1819, 1912 and 336-7-12). Six of the examples in this series are illustrated; two are not. There is little to distinguish them from each other. All of them are almost completely spherical in shape, although about half of the sample are slightly flattened. This is apparently from an imperfect mold. In size, they range between .55 and .57, with only one specimen being of this larger size. None of them appear to have been fired. Presumably, they were intended for local use in the hunting of game and were randomly lost from pockets or hunting pouches in or near the kitchen structure.

Gun Springs (2) (Nos. 31 and 32). One mainspring is present and there is also one frizzen spring. The mainspring measures 3-3/8" long and is 1/2" wide at its widest point. It is a plain spring, but well made. The frizzen spring is 2" in width and 1/2" wide. Both springs are 1/8" thick at their hinges. The ends of the leaves are thinner.

Serpent Side Plate (1) (No. 124). This object though incomplete is clearly recognizable as a "serpent" or "dragon" side plate. Such side plates were common on late 18th Century firearms. They were located directly opposite to the gun lock and served to hold the screw heads in

place which went through the wooden gunstock and into the steel lock plate. Side plate design went through many evolutionary changes but by 1780 had settled down to be a cast brass object with three circular loops for screw heads. One of these was at each end of the plate and the other in the center. This specimen measures 4" in length and is 7/8" in width across its large loop. Many similar specimens are illustrated in the literature concerning late 18th Century and early 19th Century firearms. Close resemblances are with ca. 1790-1815 pieces from Missouri (Hamilton, 1960, p. 133) and pieces from the Northwest (Hanson, 1955, pp. 15-16).

Lock Plate (1) (No. 33). This plate is stripped down completely. Even the pan has been removed. The plate's outline is that of the late 18th Century style which had a straight base, a rounded front and a tear drop shaped rear end. A notch is present, of course, for the pan on the top portion. Often a squared platform was in front of it for the frizzen to rest on. Generally, this plate is 1/8" thick, but the straight platform in front of the frizzen is 5/16" thick. Apparently it has been thickened by a piece which was forge welded on as a reinforcement for the frizzen which took the shock when the flint struck it.

This plate has a total of nine screw or bolt holes through it. One of them is, of course, for the large round hole for the tumbler shaft which rotates the flintlock hammer. This hole is circular and 1/4" in diameter. The other eight holes were for the attachment of the plate to the wooden gun stock, for the attachment of the frizzen, main and sear springs and for the various moving parts.

All of the firearm components from this structure are of the 18th Century variety and of typically English manufacture. Doubtless they were used for local hunting and sport for cooking personnel or permanent staff members.

Gun Barrel Segment (1) (No. 1854). This unusual specimen is the fore part of a gun barrel which was cut off and apparently made into a rough scraper, or which was cut off to shorten a firearm. It is 6-5/8" in length and 3/4" in outside diameter. The bore diameter is .575" although it has rusted to a degree. Barrel wall thickness is .090". A rectangular slot is visible in the barrel at a point 3" behind the muzzle. At one time, it held the front sight of the firearm.

Flintlock Hammer Base (1) (No. 1297). Present, but in a very fragmentary form is the basal portion of a flintlock pistol hammer or cock. It is diminutive in comparison to hammers on the North West guns for instance. It is 13/64" thick and has a small squared hole in its base which once went over a square shaft connected with the sear on the interior of the firearm. This square hole is approximately 3/16" on a side.

Lead Shot (7) (Nos. 591, 658, 673(4), and 1244). These spherical objects are present in a considerable range of sizes which, of course, testify to their varying uses in hunting game. Present are shot in these sizes: .125", .130", .185", .200", .205", .210" and .280". The smaller shot could have been used for hunting local grouse or partridges; even the now extinct passenger pigeon which was once common in the area.

Slightly larger shot would have been more suitable for hunting waterfowl such as ducks and geese. The largest shot in the .280" size could have been used for deer as it is of the class known as "buckshot." The presence of such shot in and around the kitchen structure testifies to the hunting instinct possessed by most of us. At Grand Portage in the late 18th Century, it may indicate a desperate need to provide a variety in diet. Presumably, salt beef and pork would pall on the palates of most fur trade employees after a few months.

Lead Fragments (4) (Nos. 310, 1048, 1279 and 336-7-4). Further evidence as to local hunting activities is provided by three randomly shaped pieces of lead left over from the casting of lead balls or shot, and a triangularly shaped fragment which was discarded from the lip of a lead shot mold. This object is wedge shaped and 1/4" on a side and 3" in length. Such casting remnants are called "sows" because the shot was attached to the sprues or nipples and, of course, cut off for use.

Figure 35

FIREARMS COMPONENTS: Gun Flints, Gun Parts and Lead Balls

- Items 1-8, Nos. 700, 38, 441, 146, 1269, 384, 733 and 662. Gun flints.
The majority of these are clearly of British origin being prismatic in form and made from a dark flint.
- Item 9, No. 25B. Lead bar with a hole drilled through it.
- Item 10, No. 25. Flintlock vise screw.
- Item 11, No. 233. Metal washer which may be from a flintlock vise.
- Item 12, No. 1491. Portion of brass sideplate from a flintlock firearm.
- Item 13, No. 336-10-22. Flintlock cock or hammer.
- Items 14-19, Nos. 1549, 833, 872, 1847, 1819, 872 and 1912. Lead musket balls.
- Item 20, No. 31. Flintlock mainspring.
- Item 21, No. 124. Portion of a dragon sideplate from a flintlock firearm.
- Item 22, No. 32. Flintlock frizzen spring.
- Item 23, No. 33. Stripped down flintlock lock plate.

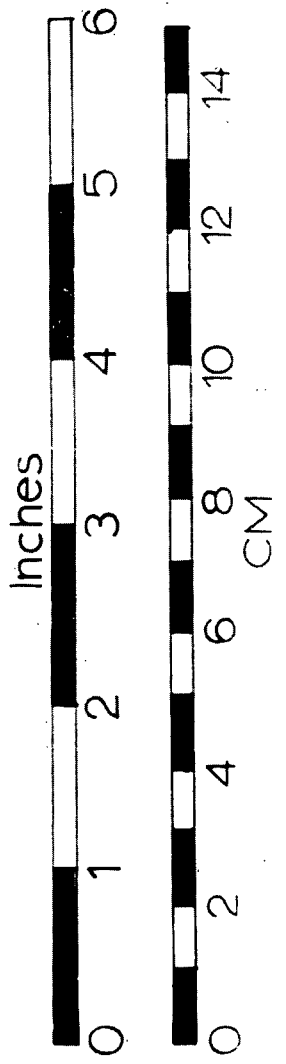
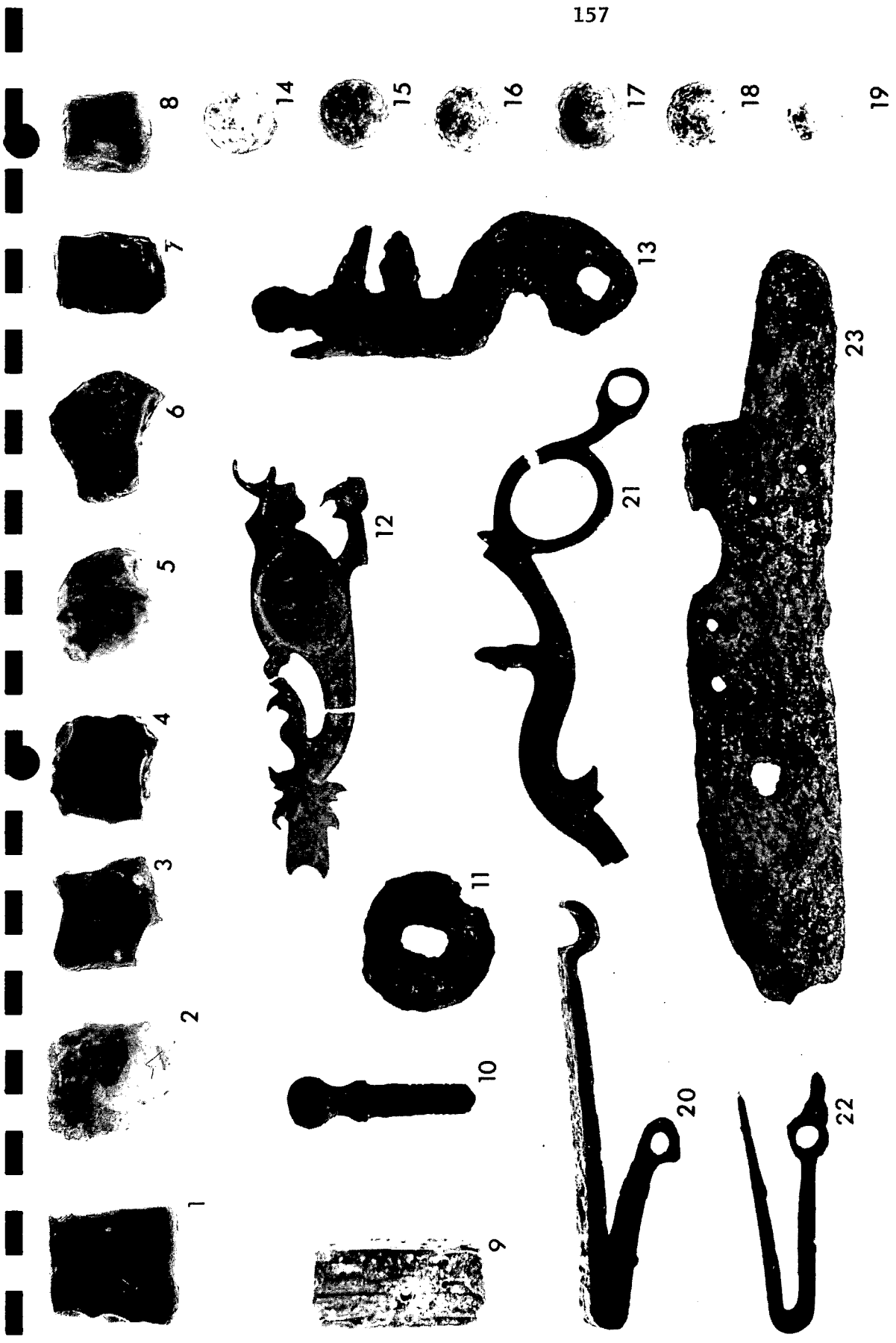


Figure 35: Firearms Components. Gun Flints, Flintlock cock and Side Plates.



HOUSEHOLD GOODS

(Figure 36)

Cutlery

Forks (16) (Nos. 335, 531, 1087, 1088, 1089, 1374, 1521, 1571, 1580, 1657, 1670, 1671, 1746, 1836, 1837 and 1838). These sixteen specimens can be divided into two major classifications. These are those with tapered rectangular shanks and those with flat riveted shanks.

There are 8 forks with the tapered rectangular or rat-tailed shanks. Six of these forks are two tined; two of them are three tined. These forks are made from one piece of iron. In cross-section, the tines are scooped or hammered out below the shank. The mid-section is round and has a pronounced bulge in its center. At the end of the mid-section, the shank is constricted and then flares out again to form a bolster just prior to the wooden handle. Generally, these forks have three major sections which are: the tines which are ca. 2" long; the mid-section which is also 2" long; and the tang which is likewise 2" long. Thus, overall length of a typical fork, less handle, is about 6". The tapered shank commences just behind the bolster. It is rectangular in cross-section and tapers to a point. It is possible that round wooden handles may have been force-fitted onto these shanks, though they could have been oval in cross-section also.

Three two-tined forks form a sub-classification. These have tines which project outward from the shank in a straight fashion. It is possible that they are small meat carving or serving forks. Also, they could merely be an older and more simple style of fork. The two three-tined forks in this sample are very similar to the others in their general

form. One minor difference is that their tines are shorter and that their bolsters are larger.

The flat shanked forks also are much similar in general appearance to the series with the tapered rectangular shanks. There are 8 forks in this series. Their tines and bolsters are identical to the others. The major difference seems to lie in that they have flat shanks which held three steel rivets. The rivets, of course, held the oval two piece wooden handles to the shanks. A complete fork, with handles, of this type would measure about 6-1/2" to 6-3/4" in length. See May, (1963, p. 5).

Forks of a similar appearance and style were used at Michilimackinac as they have been recovered from this site (Maxwell and Binford, 1961, p. 110 and Plate XIV). Hume illustrates identical two-tined forks with flat shanks, (Hume, 1970a, p. 182).

Knives (9) (Nos. 575, 989, 1090, 1699, 1798, 1800, 1853, 1902 and 336-25-20). These knives appear to be composed of three types which are table knives, carving knives and general utility or butcher knives. The table knives are represented by two handles and portions of the blades. These specimens have forged bolsters which precede the handles. The handles are in two pieces and of wood which are fastened to the flat shanks by three steel rivets. These handles are 3" in length. Fragments of two bone handles with cross-hatched lines were recovered.

Another type of knife is the carving variety. There appear to be two examples of this type in the sample. Characteristically, these knives are larger and more massive than the table knives. Their blades

are wider and have a slight rise about 2" in front of their bolsters. Further, their handles appear to be of bone and are larger than those of the similar table knives. A knife of this type would probably have been about 10" or 12" in length. The blades would have been in the neighborhood of 6" - 8" and the bolsters and handles about 4" long. The handles all appear to have been two piece and fastened to the flat steel shanks with three steel rivets. The blades were about 1" in width and had a "V" grind.

A third type of knife is that of the common butcher knife of the period. The top of its blade is thickened and almost straight. The blade is wider near its rear and becomes narrower as it gradually curves upwards to the point. The total length of such a knife, including the handle would be about 7" - 8". The rear of the knife has a narrower shank section which is about 2" long and 3/4" wide. It has two rivet holes for attachment to a two piece oval wooden handle. The blade is about 1" wide, 6" long, and has a "V" ground cutting edge.

The last type of knife is represented only by two fragmentary blades. They are distinguished by sharp upward curves near their tips. These blades are about 7/8" wide, 5" long and have a sharp "V" grind on their cutting edges. Although no handles have survived, they were probably two piece wooden affairs and attached with two or three steel rivets.

Cross-hatched two piece bone knife handles have been found at Michilimackinac, Maxwell & Binford, 1961, Plate III, d, and at other British sites, (Hume, 1970a, p.182). Fragments of two similar bone knife handles, Nos. 1202 and 1319 were found in the Kitchen.

Spoons (10) (Nos. 192, 1083, 1084, 1085, 1086, 1240, 1492, 1710, 1891 and 1928). Although some of these spoons are represented only by pieces, enough of them have survived to allow an identification as to type or size. There are four size ranges in this collection of pewter spoons. Most of them have oval bowls, often with rather sharp points. They are longer and deeper than modern spoon bowls. The handles are slightly thicker at the rear of the bowls. Often, they were cast so that the beginning of the handle commences in quite a noticeable manner under the base of the bowl. The handles flare out slightly to the rear of the bowls and then become constricted for about one-third of their length. At this point, they are rounded on the top and flat on the bottoms of the handles. The handles now gradually start to become thinner and to flare out. They all terminate in rounded ends. Most of them have the familiar "fiddle back" design on this location.

These handles also appear to be almost straight with only slight curves in them. All except one spoon are plain. The exception has a row of small dots bordering a line which follows the general contours of the spoon handle. Most of these examples bear stamped designs on the rear of their handles. These are a Crown over an X and the letters LONDON within an oval border. A number of pewter studies indicate that these marks were used to indicate a toughened pewter which was used by the 1770's for spoons and other tableware. Eventually, these marks came into such general usage that they had only a generic meaning.

A third size range has a bowl which is 1" wide and 2-1/8" long. This bowl had been crudely crimped or hammered together to resemble

a ladle. Much of its handle is missing, but it probably had a total length of around 8". Largest of all are the stirring or serving spoons. They have lengths of slightly more than 8" and bowls that are 1-5/8" wide and slightly more than 3" long.

It would appear that these spoons are largely simple utilitarian objects which were cheaply made in the last quarter of the 18th Century. They are, of course, of British origin. (Cotterell, 1970, p. 49).





Figure 36

HOUSEHOLD GOODS: Forks, Knives and Spoons

Items 1-12, Nos. 1671, 1374, 1746, 1088, 1836, 1087, 1837, 1838, 1089, 1580, 1670 and 335. Table forks, of the two and three tined variety. Most of them have rat-tailed tangs which were fastened into handles. A few have flat shanks; handles were riveted to them. Wooden handles appear to have been the most common, though a few bone ones are present.

Items 13-20, Nos. 889, 1853, 1669, 1090, 1902, 1798 and 1800. Kitchen and table knives. The bulk of these specimens appear to be common kitchen knives, though fragments of a few table knives are present. Most of them have wooden handles, but the remains of a few bone handles are present also.

Items 21-29, Nos. 458, 192, 694, 1086, 1891, 1492, 1085, 1710, 1084, 1033, and 1928. Pewter spoons. There are three or four size ranges in this sample. The smallest spoon, No. 23, is a demitasse. No. 25 is approximately the size of a teaspoon; No. 26 appears to be intermediate between a teaspoon and a tablespoon. Nos. 28 and 29 are large tablespoons or perhaps even mixing spoons. All of them are relatively simple cast pewter spoons intended for casual usage.

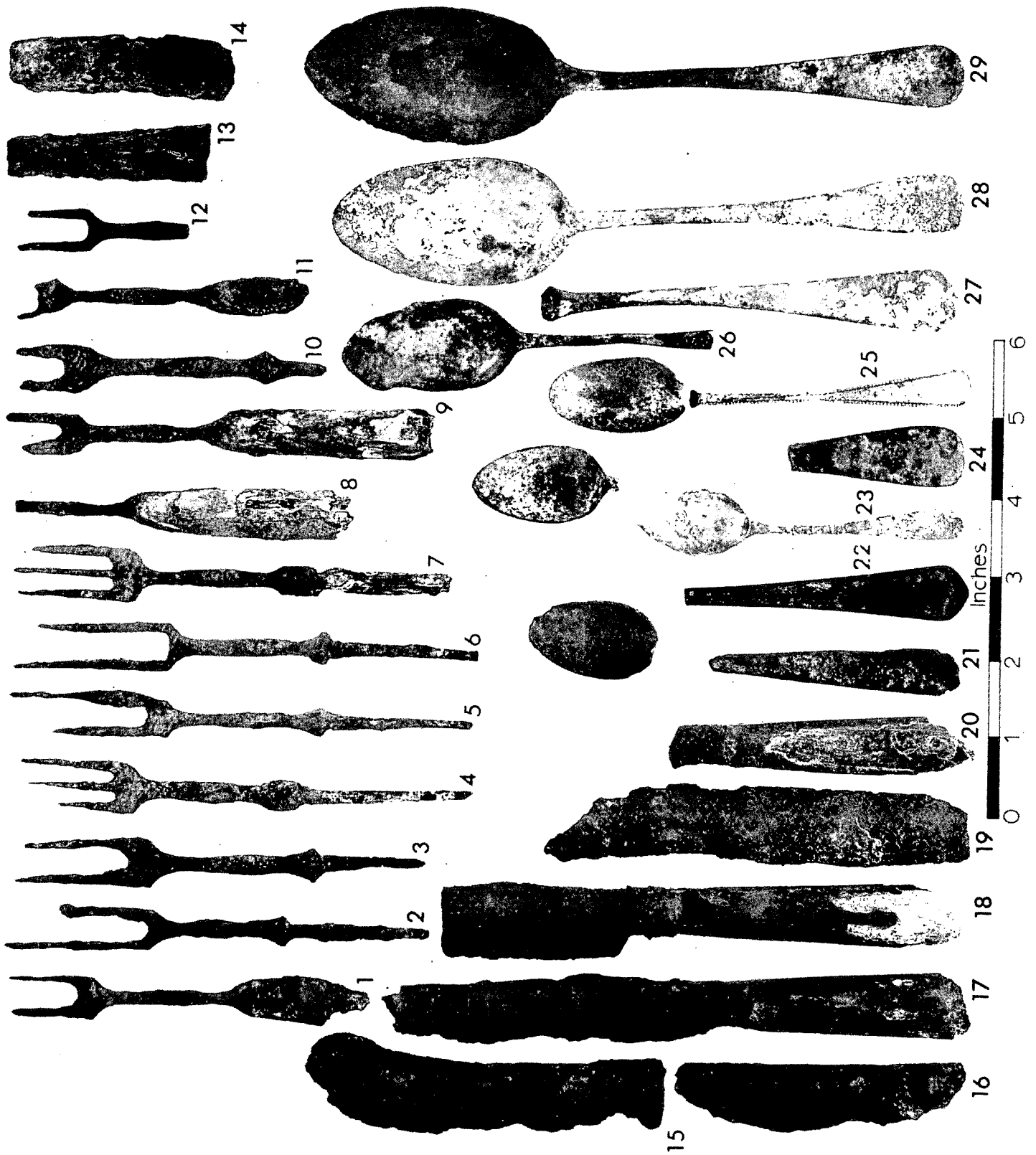


Figure 36: Household Goods. Forks, Knives and Spoons.



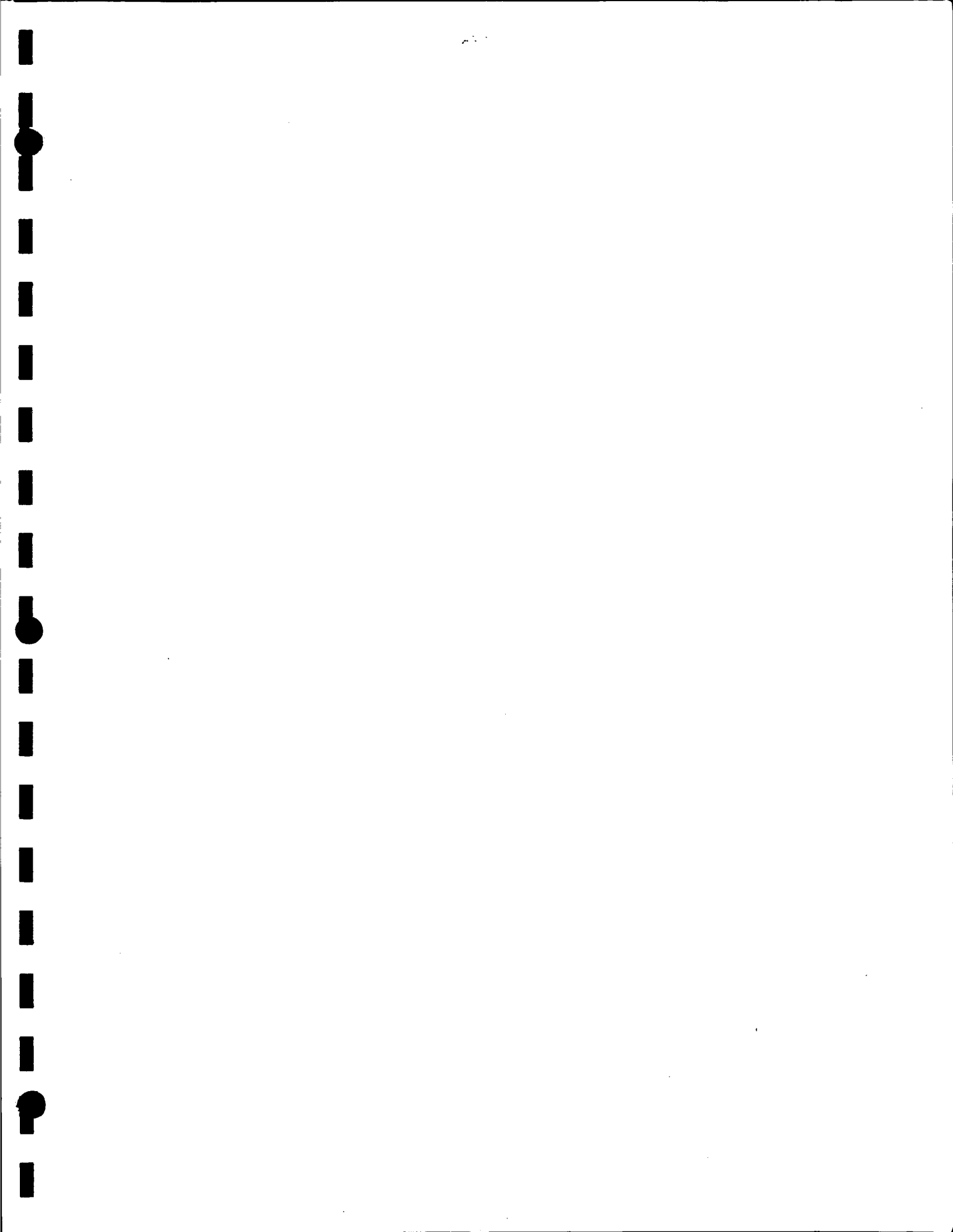


Figure 37

HOUSEHOLD GOODS: Pewter Spoons

Items 1-5, Nos. 1086, 1085, 1710, 1084 and 1928. Pewter spoons. The smallest spoon, No. 1, is a demitasse. No. 2 is in the range of a small teaspoon. No. 3 is incomplete as it lacks a complete handle, but it appears to represent a size intermediate between teaspoons and tablespoons. No. 4 is the rear of a tablespoon handle. No. 5 is a complete tablespoon. Note the "Crown over X" markings and the "London" stamps. These marks are of the late 18th Century and denote a hard quality of pewter.

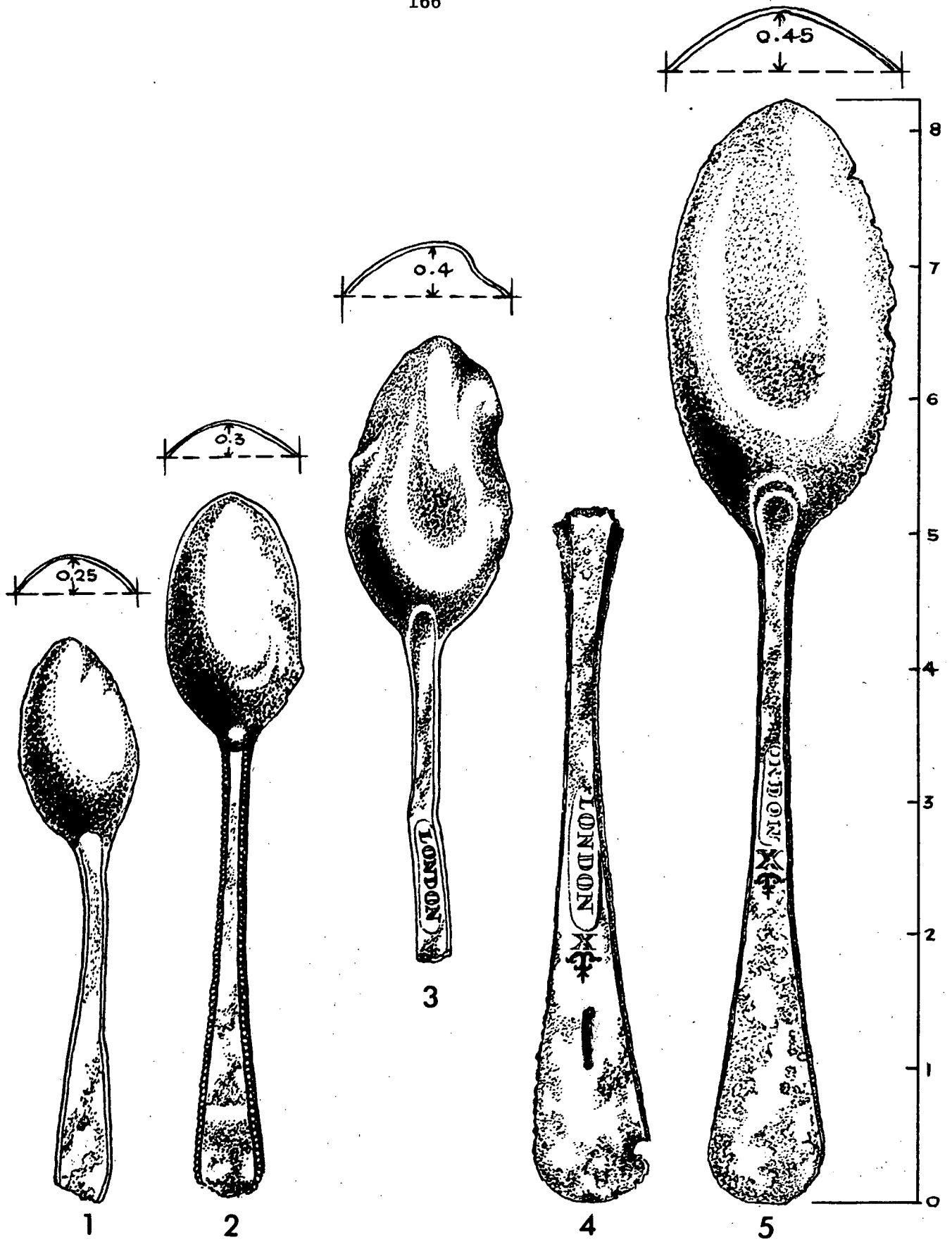


Figure 37: Household Goods. Drawings of Spoons.



HOUSEHOLD GOODS

(Figure 38)

Miscellaneous Items

Candle Snuffers (2) (Nos. 1577 and 1901). There are portions of two steel candle snuffers from the kitchen structure. One of them consists of that portion of the snuffer which closes around a candle wick and which smothers the candle flame. In appearance, it resembles a rounded flange on a part of a handle. It measures 3" long by 1/2" wide. The other snuffer is more complete though badly rusted. It has portions of the two scissors type handles, the snuffer flange and a rounded box into which the snuffer flange forced the wick. In form, it resembles a pair of small scissors. One arm is connected to a flat flange which forces a candle wick against a three sided box which has an arched top and a flat base. Another scissor type handle, of course, is connected to the arched box. Both handles pivot on a common centrally located axis or rivet. The snuffers were held off a table surface by three rounded feet. Two of these feet were located on the fore part of the scissors handles. A third foot probably was fastened to the front of this tool. It measures 3-3/4" long, 3" wide and 1-1/4" high. These are characteristic household implements (Noël Hume, 1970a, pp. 97-98).

Slate Pencil Fragment (1) (No. 1137). This specimen is 1" long and 3/16" in diameter. It is the sharpened tip of a slate pencil with a roughly circular form. Presumably, it had been used by someone in the kitchen structure to perhaps keep accounts or maybe even to list a menu on a slate!

Lead Pencil (1) (No. 952). Basically, this is a square bar of lead which measures $3/16$ " on a side and $2-5/8$ " long. For $1-3/4$ " of its length, it is square, thereafter, it has been flattened so that it forms a wedge-shaped point which is rounded. Similar specimens have been found at Fort Ligonier and Michilimackinac (Grimm, 1970, p. 97 and Plate 31; Peterson, 1964, p. 37).

Offset Awls (2) (Nos. 34 and 35). These are conventional late 18th Century leather working awls. Each of them has an "offset" or "jog" which kept the awl from working too deeply into a handle. Also, if one end became broken or worn out, it could be extracted and a new and sharp end made ready for use. No. 35 is $3-1/4$ " long and somewhat rounded in cross-section. It is $3/16$ " in diameter at its widest portion. A complete segment is $1-3/4$ " long. When new, it would have been about $3-1/2$ " in length. Identical specimens have been found at Fort Michilimackinac (Maxwell and Binford, 1961, p. 88) and at many other fur trade sites.

The other awl, No. 34, is square in cross-section and tapers from a thicker midpoint towards the sharp tip. It measures $2-7/8$ " long and is $1/8$ " wide in its widest point. The complete segment is $1-3/4$ " long from a tip to the "offset". When new, it apparently measured about $3-1/2$ " in total length.

Needle (1) (No. 1802). This specimen is incomplete as the upper portion of the eye is broken off. It is roughly circular in cross-section for a distance of 2" as measured from the eye towards the tip. Thereafter, it is triangular in cross-section for a distance of $3/4$ ". Total length is $2-3/4$ ". This needle would have measured about 3" in overall

length and perhaps was used in repairing coarse clothing or even light sewing in leather.

Pocket Knife Handle Plates (2) (No. 1823). These unusual specimens are of organic material and still slightly flexible. They appear to be formed of horn or tortoise shell; most probably of horn. To a considerable degree, they are impregnated with rust. Perhaps this has helped to preserve them. These plates are obviously "mates" or match each other from opposite sides of a knife handle. Each plate is rectangular and measures approximately $3/8$ " wide, $1/16$ " thick and $2-3/8$ " long. In cross-section, they have one straight face and one slightly curved face. Each plate bears three small holes about $1/32$ " in diameter. Two of them are centered, one at each end and the other is offset on one side. Both sets of holes match on the different plates. It is apparent that these holes served for the attachment of the plates to metal sides of a pocket knife. No doubt a metal bolster abutted against either end of them.

Pocket Knife (1) (No. 1822). Found in close association with the side plates were the rusted bolsters and spring of a pocket knife. It is possible that they are components of the same object. This badly rusted fragment is $3-1/4$ " long and $3/8$ " wide. Visible are portions of two bolsters and a rectangular steel spring.

Small Hinge and Hasp (1) (No. 40). This incomplete object is obviously a portion of a hinge and hasp which was used on something with folding segments. It is composed of two segments which are joined together

by a small two piece hinge. One of these is a triangularly shaped hinge. It is $3/4$ " wide and $2-1/4$ " long. This hinge has two centrally located holes which were used to attach it to a container. Still another hole may have been in a rounded finial which is at the terminal end of the hinge. The other portion of this device has a rounded segment with a hasp loop projecting from it. This component measures 2" long and is 1" in diameter on the rounded portion. The loop is $1/2$ " wide by $5/16$ " high. A missing portion must have consisted of a slotted hasp bar which went over the raised loop. This segment would have been attached to another portion of, let us speculate - a portable writing desk. An identical object is illustrated from Michilimackinac (Peterson, 1964, p. 16).

Brass Ring (1) (No. 195). This ring is approximately circular and is $1-1/4$ " in diameter. It is composed of a slightly flattened rod $1/8$ " in diameter. The function of this object is unknown. It is smaller than the similar kettle lid rings which it resembles.

Pan Handle (1) (No. 1672). This object is in the shape of a flattened "U". It measures $3-1/2$ " in width and $2-3/4$ " in height. In form, it closely resembles the handles used even today on shallow rectangular baking pans. It is $3/16$ " in diameter at its thickest point and is tapered towards its ends which are flattened. One end, which is complete, has a hole $1/8$ " in diameter through it and a brass rivet still in it.

Padlocks (2) (Nos. 695 and 1852). Both of these are "heart shaped" with bodies composed of two flat pieces of steel which are connected by a curved steel plate. The tops of the padlocks are indented and have steel loops which went through a hasp to secure a chest or perhaps a cupboard. Both padlocks have small ornamental keyhole cover plates which are riveted to the top center of the lock. Originally, both locks were covered with a black lacquer type finish, perhaps a Japanned finish. Each of them has a cylindrical metal pin in the upper portion of the key hole. This would have been an additional security feature as it would take a key with a hollow shank that would revolve on this pin or shaft. These padlocks are 1-3/4" in width and from 2" to 2-3/8" in height. Both locks were found within the kitchen structure. It is logical to speculate that they were used to give some security to perhaps cupboards or chests in which condiments or luxury items were stored. Hume illustrates identical though larger padlocks of the period of 1770-1780 (Hume, 1970a, p. 251).

Tea Kettle Spouts (2) (Nos. 98 and 1165). These unusual objects bear a close resemblance to tea kettle spouts in use well into the 20th Century. One of them is made of brass and measures 4-1/2" long and 4-1/4" high. The throat where it attached to the kettle is oval and is 1" wide by 2" high. The pouring spout is much constricted and has an oval shape also. The spout was given a slit on both sides. A soldered joint is visible on the upper surface of the spout. Apparently it was fabricated by being cut out on a pattern from brass sheet stock, then formed around a mould and lastly soldered shut. The base of the spout is flared out.

Apparently it was crimped inside the kettle and then soldered in place. A second spout in an unmeasurable condition was also found in the kitchen structure. It seems to be smaller and more delicate than the one described above.

Kettles (2) (?) (Nos. 466, 535 (5), 1238, 1461, 1701, 336-10-15 (2), and 336-25-19). Two straight walled cylindrical kettles appear to be represented by these fragments. An almost complete circular kettle bottom was recovered which demonstrated that it had a circumference of about 30-1/2" or a diameter of about 9-3/4". A second circular fragment may be from a similar kettle, or it may represent a kettle cover.

Definite proof that a second kettle is represented is provided by an additional rim fragment which is clearly from another vessel.

The kettle rims were formed by crimping a portion of the vessel wall over on the exterior of the kettle for a distance of from 3/16" to 3/8". No other reinforcement was used to stiffen the rim. It is rather probable that a straight seam ran up the kettle wall from its base to the rim and that this seam was crimped and soldered. It could have possibly been riveted. Still another possibility is that the seam was made in a crenelated manner and carefully soldered. These possibilities are discussed because it would be technically difficult to stamp or spin a truly cylindrical kettle from a piece of sheet brass. A number of measurements were made on pieces of kettle brass. They ranged between .030" and .035" in thickness.

Two rectangular cast brass kettle lugs were attached to portions

of one kettle. These lugs are rectangular, but with rounded corners. The lugs also have rounded projections which terminate in a spool shaped segment. The lugs are 2-1/2" long, 1-1/16" high, and 1/8" thick; they have rounded corners, are curved to fit the vessel walls, and are fastened to the kettle with two rivets 1/8" in diameter. A cylindrical casting which protrudes from the top center of the lug is 7/16" in diameter and 1/2" long. Its end terminates in a round stud which is 1/4" in diameter. A circular brass washer measuring 7/8" in diameter and .115" in thickness and with a central perforation was placed over the stud. Then the stud was peened to fasten the washer permanently. An iron wire handle would then be fastened behind the washer and used for suspension or carrying.

It is evident that one of these kettles was approximately 10" in diameter. It had a cylindrical form, with straight walls and cast brass lugs. Its height was approximately 8" and probably was used with a cover. (Fig. 52a)

Kettle Handles (2) (Nos. 716 and 1094). These two specimens are both of heavy gauge wire and give the appearance of having been used as kettle or pail handles. One of them is made of wrought iron wire that is .225 in diameter and 9" in length. One end of it is bent into a half rounded position. The other specimen is made of round wire .30" in diameter. It is 6" long and on one end bears a sharply bent eye which would have fitted into the lug or ear of a kettle.

Kettle Lug (1) (No. 950). This lug is of cast iron. Its form is that of a rectangle with rounded corners. The main body of the piece is curved to fit the curved contour of a large kettle. In the upper center of the lug is the base of a small flange which curved downwards to form a holder for a kettle handle. There are two large brass rivets attached to the lug. One of them is at each end of the rectangle. They are approximately $1/4$ " in diameter. On the interior of the lug are the flared rivet heads. These are $1/2$ " in diameter. The lug itself is $3/16$ " in thickness. It was used on a large kettle of more than 5 gallons capacity.

Pewter Bowl Fragment (1) (No. 194). One small fragment was found of what appears to be the rim of a pewter plate. It is $1-3/8$ " wide and 2" long. The portion which goes inwards to the body of the plate is .065" thick. The rim of the vessel is curved and thicker. The lip is rounded and .125" thick. A decorative double line is scored into the curved rim $1/8$ " from its outer edge. This object is badly eroded.

Ladle Handles(?) (6) (Nos. 403, 576, 617, 1342, 1422, & 1799). None of these objects are complete, nor is it possible to be absolutely sure of their function. In general, however, all of them appear to be incomplete handles from ladles, dippers and the like. One specimen is of light gauge stamped metal .065" thick. The main body of the handle is $1/2$ " in width, but it flares out to a rounded end which is 1" in diameter. In this end is a suspension hole measuring $1/4$ " in diameter. The object is $4-1/4$ " long.

Another specimen is also of lightly stamped metal .100" thick, but has a slightly rounded aspect on one face. This object is $1/2$ " wide

but flares outward to a width of $3/4$ " at one end. Presumably, this wider end was for attachment to the bowl of a ladle. At the other end is a circular hole $3/16$ " in diameter.

A third specimen consists only of the oval suspension eye of a ladle handle. It was fastened to a handle which was $1/2$ " in width and $.110$ " thick. The eye portion is flat bar stock $3/8$ " wide and $.125$ " thick. The eye measures $1-1/4$ " wide by $1-3/4$ " high. This apparently came from a rather large and massive ladle. A final specimen in this classification is a segment of round iron wire $3/16$ " in diameter and 2" in length. The major portion of it is round but one end is flattened for a riveted attachment to a spoon or ladle bowl.

Steel Barrel Hoops (24) (Nos. 1263, 1421, 1550, 1770, 1903, 226-13-10, 336-25-15, 336-25-16; 266, 653, 654, 849, 1397, 336-16-15, 336-16-16 and 336-27-11). These are present in two widths. The narrower width measures between $7/8$ " and $1-1/16$ " in width and averages about $.100$ " in thickness. The wider width hoops measure from $1-1/4$ " to $1-3/8$ " in width and also approximate $.100$ " in thickness. The wider width hoops measure from $1-1/4$ " to $1-3/8$ " in width and also approximate $.100$ " in thickness. Most pieces of hoops are short and badly rusted. One piece, however, is reasonably intact. It is 14 " long. In use, all of these specimens, of course, were the fastening bands on barrels. A study of the faunal remains from the kitchen building has shown that considerable quantities of pork and beef were consumed. Logically, this meat was brought to Grand Portage packed in brine and in water tight wooden kegs which were held together with steel hoops.



Many segments of these hoops bear rivet holes, and in some instances, rivets. These fasteners were used, of course, to close the steel hoops into circles. On the wider hooping, rivets $3/8$ " in diameter appear to have been used. Their heads were peened to diameters of about $3/4$ ". The narrower hoops had rivets about $1/4$ " in diameter. Their heads were peened to approximately $5/8$ " in diameter. In one instance, a hoop end has three holes which are separated by about $3/4$ ". This was apparently to facilitate tightening a hoop before it was fitted onto a barrel. In a few instances, hoop ends are rounded. Presumably this was to prevent injuries to persons handling the barrels.

Miscellaneous Brass Objects (2) (Nos. 1050 and 1720). A strip of brass measuring $1-1/8$ " wide and 6" long and .035" thick was found. It contains four perforations approximately $1/8$ " in diameter. One of them yet is filled with the remains of an iron rosehead nail. At first glance, this would appear to be a portion of a brass barrel hoop. Close inspection, however, casts serious doubts on this identification. Brass or copper hoops were at times used on powder kegs, but they had copper nails to prevent sparking which might ignite the powder. Secondly, there would be no necessity for four perforations in such a short piece if it were truly a barrel hoop. Lastly, the brass strip appears to be too thin to have served as a hoop. Its true function remains a mystery.

Another puzzle is caused by the presence of a rectangular object which is 1" wide and 2" long that is made of a doubled piece of sheet brass. It has two pairs of perforations. Superficially, it resembles



a kettle lug, but there are a number of reasons for rejecting this identification. It must remain a puzzle for the present at least.

Unidentified Materials. A continuous coil-like device (896) composed of a flat steel band was found during excavation of the kitchen structure. It may have been a spring of sorts or else steel reinforcing around wood which had decomposed. This band was $1/4$ " wide and about $3/32$ " thick. It composed a spiral, coil-like device, $2-1/2$ " in diameter and 8" in length.





Figure 38

HOUSEHOLD GOODS: Candle Snuffers, Awls, Locks and Tea Kettle Spout

Items 1 and 11, Nos. 1577 and 1901. Portions of candle snuffers.

Item 2, No. 1142. A cast brass finial of unknown usage.

Item 3, No. 1137. A slate pencil fragment.

Item 4, No. 1240. A fragmentary pewter spoon handle.

Item 5, No. 952. A lead pencil made from a bar of lead.

Items 6-7, Nos. 35 and 34. Two offset steel awls.

Item 8, No. 1802. A steel needle.

Items 9-10, No. 1823 (2). Pocket knife handle plates.

Item 12, No. 40. A chest or writing desk hasp and hinge.

Item 13, No. 195. A circular brass ring.

Item 14, No. 1672. A baking pan handle.

Items 15-16, Nos. 695 and 1852. Two steel padlocks.

Item 17, No. 98. A brass tea kettle spout.

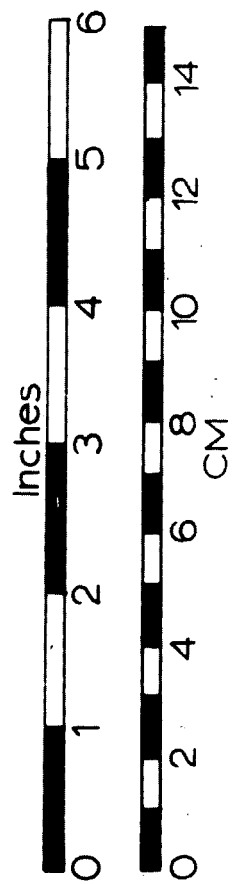
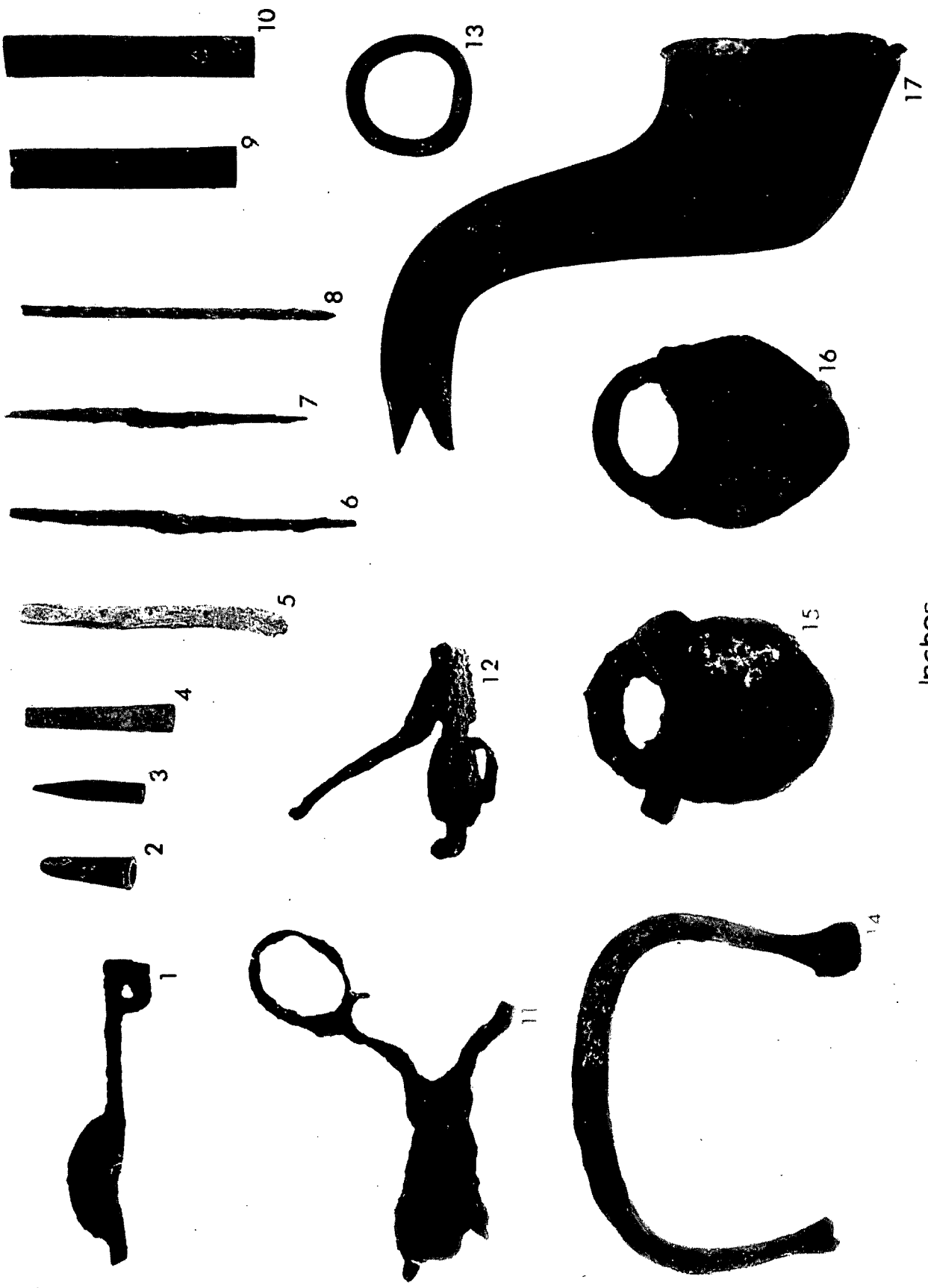


Figure 38: Household Goods. Candle Snuffers, Awls, Locks, and Tea Kettle Spout.



HOUSEHOLD GOODS

(Figure 39)

Brass Cocks and Collars (398, 1140, 1638, 1686; 163, 190, 523, 845, 1462, & 336-27-15)

Brass Cocks (4) There are four brass cocks or faucets in this series. Basically, the brass cock is a spigot or faucet used for the dispensing of liquids. Most commonly, it was used during the 18th Century to remove liquors such as rum, brandy, etc. from wooden kegs. These objects were made of a moderately soft brass. Therefore, they had to be handled with some care. In an effort to overcome this problem, cocks were designed with driving platforms which protruded from their front ends. The portions which went into the bung hole of a barrel were fluted to make a tight fitting seal with wood fibers. In addition, there appears to have been some need for security to prevent unauthorized individuals from tapping kegs for their own use.

This need led to the design of cylindrical brass collars which fitted over the valve portion of the cock. The collars had a variety of designs such as squares, rectangles, diamonds, clubs, etc., cut into their tops. Only a key which matched this design could be passed through the collar hole and down into a similarly shaped recess on the top of the cock. Thus, a complete and operative brass cock consisted of the cock, a cylindrical collar and a loose key with a distinctive design which fitted through the collar into a recessed slot in the valve portion of the cock.

Complete brass cocks range in length from 5-1/4" to 5-3/4" and 2" to 2-1/2" in height. Their largest diameters (at the rear of the valve), ranges from 3/4" to 7/8". The pouring orifice diameters range from .355" to .490". The weights of the three relatively complete specimens are from 5 to 6-1/4 ounces.

It is readily evident that all of these cocks had been used until they became unusable. Three of them have broken valve shafts; one has a broken off stem. They also show signs of battering on their driving platforms. Further, all of them have valves which are frozen into a closed position. Presumably, their valve shafts were broken in an effort to open them. One cock has a crack which appears to be a casting flaw in its stem.

There appear to be two basic designs in the valve shafts and security systems of these four cocks. Two of them have solid, but sheared off valve shafts which bear diamond designs. They apparently were of the type described in some detail immediately above. The second type is represented by two specimens which have circular valve shafts which have a round cavity in their centers. A slit approximately 1/8" in width runs through the centers of these shafts. In the center of the valve seat is a round stud which projects upwards. The key to this type of cock must have been circular and have fitted over the outside of the split shaft. Most probably, it had a central wedge which slipped into the kerf and on down into the circular valve seat. Here it had to have a drilled hole which fitted over the upward projecting stud. In the almost unidentifiable class are two portions of the broken off valve shafts. These are items 197 and 870. They belong with the second type of brass cock which had the circular valve shafts with the round cavity in the center and the slit or kerf through them.

It is readily apparent that these cocks and their fittings were produced well along in the Industrial Revolution as they are well made, sophisticated, and obviously from patterns which had been improved upon over a period of many decades. Additionally, the driving platform of one cock bears the numeral ("9"). Perhaps this is a size designation or a pattern number.

Brass Cock Collars (6) There is a high degree of similarity in the size and general appearance of these objects. All of them are brass cylinders with one partially closed end. These ends are cut or filed into a variety of shapes. In this sample are these designs: diamond (3), rectangle, "club" and "christmas tree" or triangle with a key. All of these specimens are about 3/4" in diameter and 1" in height. All of them have turned designs consisting of grooves on their exteriors. Their weights range from 1/2 ounce to 11/16 ounce.

As early as 1770 cockfounding had become a specialized part of the brass foundry trade. In part, this appears to have been aided by the increase in the use of steam power as the engineering trade needed many types of well made brass fittings. Birmingham, England, for instance, had five cockfounders in 1770. This specialization continued to increase towards the end of the 18th Century. (Hamilton, 1967, pp. 264-265).

Brass cocks continued in use through the 19th Century and into the 20th Century. An 1892 Farwell, Ozmun, and Kirk hardware catalog of 1892 shows almost identical specimens for sale (p. 700). The British Army and Navy Association catalog of 1907 shows similar items on page 223.

Figure 39

HOUSEHOLD GOODS: Brass Cocks and Collars

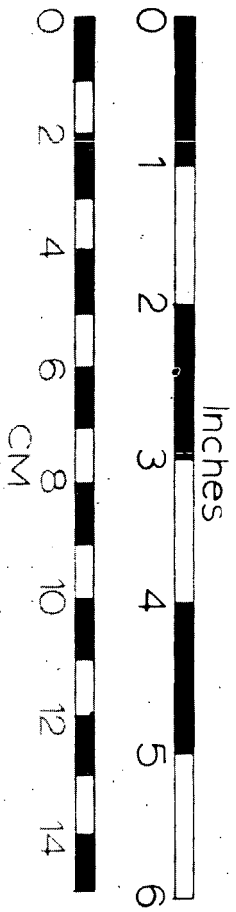
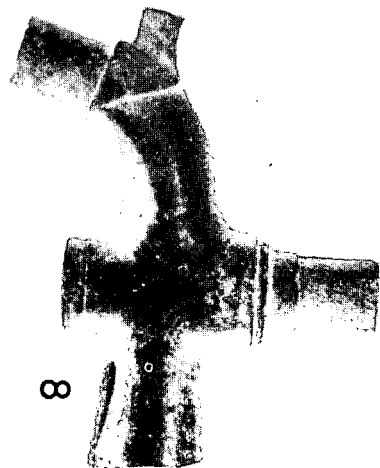
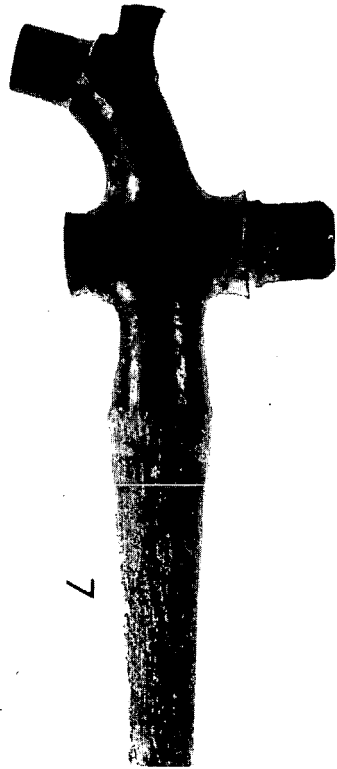
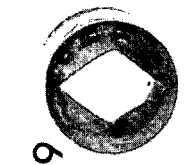
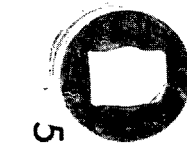
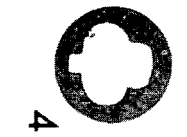
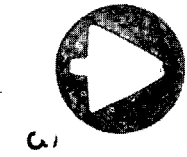
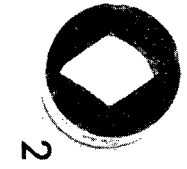
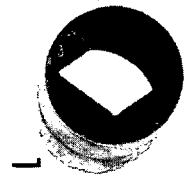
Items 1-6, Nos. 523, 1462, 845, 336-27-15, 163 and 190. Brass cock collars which were used as a security device to prevent pilfering of liquor.

Items 7-10, Nos. 1686, 1140, 398 and 1638. Brass cocks or spigots. There are two major types of valve stems on these cocks. Two of them, Nos. 7 and 8, have split shafts. The others, Nos. 9 and 10, have solid shafts.

Brass cocks were used to dispense liquors from wooden kegs up to almost modern times. They were common at fur trade establishments of the eighteenth century.



Figure 39: Household Goods. Brass Cocks and Collars.



HOUSEHOLD GOODS

TABLE 5

SYNOPTIC OUTLINE OF THE CERAMICS RECOVERED
FROM THE GRAND PORTAGE KITCHEN STRUCTURE

by Edward U. Lofstrom

(Figures 40-47)

Class A EARTHENWARE

- Group I Tin-Glazed Earthenware (1 vessel)
- Group II Creamware
- Type A. Plain (9 bowls, 2 saucers)
- Type B. Relief-Decorated (1 tea bowl, 2 plates)
- Type C. Hand-Painted (1 tea bowl)
- Type D. Miscellaneous (1 large bowl or platter)
- Group III Pearlware
- Type A. Hand-Painted, Cobalt Blue (11 bowls)
- Type B. Hand-Painted, Polychrome (10 bowls)
- Type C. Relief Decorated (4 bowls)
- Type D. Transfer Printed (3 bowls)
- Group IV Coarse Earthenware (4 jars, 1 large vessel of indeterminate form, 1 small vial)

Class B STONEWARE

- Group I English White Salt-Glazed Stoneware (1 small cup?)
- Group II Brown Salt-Glazed Stoneware (1 jar, 3 vessels of indeterminate form)
- Group III Unglazed Red Stoneware (1 teapot?)

Class C PORCELAIN

- Group I Chinese Export Porcelain
- Type A. Blue and White (3 bowls, 1 saucer, 1 vessel of indeterminate form)
- Type B. Polychrome (1 vessel)

The minimum number of ceramic vessels represented is 63. From a functional standpoint, these are: 2 tea bowls, 3 saucers, 1 tea pot, 1 cup, 2 plates, 6 jars, 7 indeterminate forms, and 41 bowls.

Ceramics

The kitchen area at Grand Portage is notable for the remarkably high density of ceramic sherds recovered in and around the structure. A total of 3328 sherds were found; this sample represents at least 95 percent of the eighteenth century ceramic artifacts (excluding kaolin pipes) recovered to date from the site.

The classification used by J. J. Miller and L. M. Stone (1970) in their description of the eighteenth century ceramics from Fort Michilimackinac will be followed in describing this assemblage. Some changes have been made, notably the addition of a new group, pearlware, to the class of earthenwares. The three basic classes of ceramics-- earthenware, stoneware, and porcelain--have here been divided into a total of nine groups on the basis of details of paste and glaze. These groups are then further subdivided into types on the basis of technique (and in some cases, color) of decoration.

The most serious problem encountered during the analysis of this material was the extremely fragmentary nature of the ceramic artifacts. This made it difficult in some instances to determine the number of vessels or to do more than estimate their size. It should, however, be clear in the text when and on what basis estimates of number or size are made.

Munsell color designations are given whenever it seems useful to do so. Some colors, such as cobalt blue, are assumed to be sufficiently familiar to the reader so that they need no description. One area where Munsell color designations may be particularly helpful is in differentiating pearlware from creamware. Pearlware is essentially a slightly modified creamware, with the result that sherds of each are very similar in many respects. Creamwares are usually described as "yellowish" or "cream-

colored," while pearlwares are often described as having a "bluish tint." A few hours of handling both will generally teach the difference; but where representative examples of each are not available, Munsell colors may aid in identification. Munsell colors are not given for brown salt-glazed stoneware, because the glaze is generally speckled or mottled, or for Chinese export porcelain, which is easily identifiable by attributes other than body color.

Color comparisons were made in daylight using the glossy finish collection of the Munsell Book of Color (1966).

Class A. Earthenwares

As a class, earthenwares are characterized by an opaque, permeable paste. Coarse earthenwares may be made from ordinary clays fired at relatively low temperatures, but finer earthenwares such as creamware and pearlware must be manufactured from special white clays (Miller and Stone 1970:42). Various kinds of lead glaze are most commonly found on earthenwares of the late eighteenth century.

Group I. Tin-glazed Earthenware

Nine sherds of undecorated tin-glaze earthenware, representing one small vessel (perhaps a jar) of indeterminate size, were found in the kitchen area at Grand Portage.

Tin-glazed earthenwares consist of a relatively soft buff to pinkish paste covered with a lead-glaze that is rendered an opaque white by the addition of tin oxide (Miller and Stone 1970:26). The fragments at hand have a pale blue glaze (Munsell 5B 9/2) over a buff paste. The glaze is poorly bonded to the paste; large areas of glaze have exfoliated.

In the absence of decoration, it is difficult to identify the origin of this vessel. Large amounts of both English (delft) and French (faience) tin-glazed earthenware were found at Fort Michilimackinac (Miller and Stone 1970:26).

Group II. Creamware

A total of 923 creamware sherds representing a minimum of 16 vessels were recovered from the kitchen area at Grand Portage.

Creamware was an exclusively English product that saw its greatest popularity from 1760 until the 1780s, when it began to be replaced by pearlware. It has, however, been found in a North American archaeological context dating as late as the third decade of the nineteenth century.

C. Malcolm Watkins identified four creamware sherds among the ceramics recovered from Kipp's Post, North Dakota, which was occupied from 1826 to 1829 (Watkins, in Woolworth & Wood 1960:229; & Noël Hume, 1968, pp. 296-299).

Creamware is composed of a relatively hard, fine-grained, off-white paste covered with "a liquid lead-glaze which impart[s] a clear, slightly yellow, sparkling finish to the wares" (Miller and Stone 1970:42). Much of the creamware from Grand Portage is discolored to some extent but unstained sherds exhibit a very pale yellow color closely approximated by Munsell 5Y 9/2 and 7.5Y 9/2. Where the glaze is especially thick, such as in the body-foot juncture, creamwares sometimes exhibit a distinctly greenish-yellow color.

Type A. Plain

Nine hundred and nine undecorated creamware bowl and saucer sherds were identified. One bowl was substantially reconstructed (Fig. 40a) and an additional eight bowl bases were partly reconstructed.

These bowls are roughly hemispherical in shape with a simple foot that is wedge-shaped in cross-section. The restored vessel has a maximum diameter of 6 inches and a total height of 3 inches. The foot is 3 inches in diameter and $\frac{3}{8}$ inch high. Measurements on the reconstructed bases all fall close to those of the reconstructed bowl. Feet range from $\frac{3}{8}$ to $\frac{1}{2}$ inch in height, and on measurable examples, foot ring diameters are all about 3 inches. The walls on these vessels are quite thin, ranging from about $\frac{3}{32}$ inch at or near the rim to $\frac{7}{32}$ inch near the foot. Several rim fragments, apparently from one vessel, exhibit a slightly out-flaring lip.

Also present in the collection is a base fragment of a small bowl, perhaps a tea bowl (Fig. 41a). The foot measures an estimated 2 inches in diameter by $\frac{1}{4}$ inch in height. This base may be reasonably attributed to one of two decorated tea bowls described below.

A second vessel form is represented by one reconstructed example (Fig. 41f) and a single base fragment from a second vessel. They are perhaps best described as "shallow bowls" and may well be saucers. The reconstructed example has a total height of $1\frac{1}{4}$ inches and a maximum diameter of 5 inches. The diminutive foot is $\frac{1}{8}$ inch tall; diameter of the foot ring is $2\frac{15}{16}$ inches. Thickness of the vessel wall ranges from $\frac{3}{32}$ to $\frac{7}{32}$ inch.

Type B. Relief Decorated

Four rim fragments from a small bowl are decorated just below the lip on the exterior with an impressed beaded band $\frac{1}{16}$ inch wide. Curvature of the rim indicates that this vessel was considerably smaller

than the 6-inch plain creamware bowls and may be a tea bowl.

A total of 8 plate sherds, representing a minimum of 2 plates, were identified. Four of these are relief decorated rim sherds. Decoration consists of a simple half-round molding on the top surface of the rim along the edge of the plate. One plate has a flat rim 1-1/4 inches wide. The rim maintains a consistent thickness of 5/32 inch, and the decorative molding is 3/16 inch wide. This plate was probably 9 - 10 inches in diameter. The second plate has a slightly concave rim 1-1/8 inches wide which tapers in thickness from 3/32 inch at the outer edge of the rim to 3/16 inch at the inner edge. The molding is 1/8 inch wide. Diameter is indeterminate.

Type C. Hand-painted

The only hand-painted creamware vessel is represented by a single rim sherd decorated with horizontal underglaze cobalt blue stripes. A stripe 1/8 inch wide was applied just below the lip on the exterior, and a similarly placed stripe, 3/16 inch wide, on the interior. Size of this vessel is indeterminate, but the curvature suggests a second tea bowl.

Type D. Miscellaneous

The single foot fragment in this residual category is best described by reference to Fig. 40b. The foot is 1/2 inch high, and assuming a circular foot ring, between 5 and 6 inches in diameter. The vessel wall is 1/4 inch thick at the base. After carefully examining the creamware body sherds, it appears that this fragment is the only extant piece of the vessel. It may be a portion of a large bowl, or perhaps a platter.

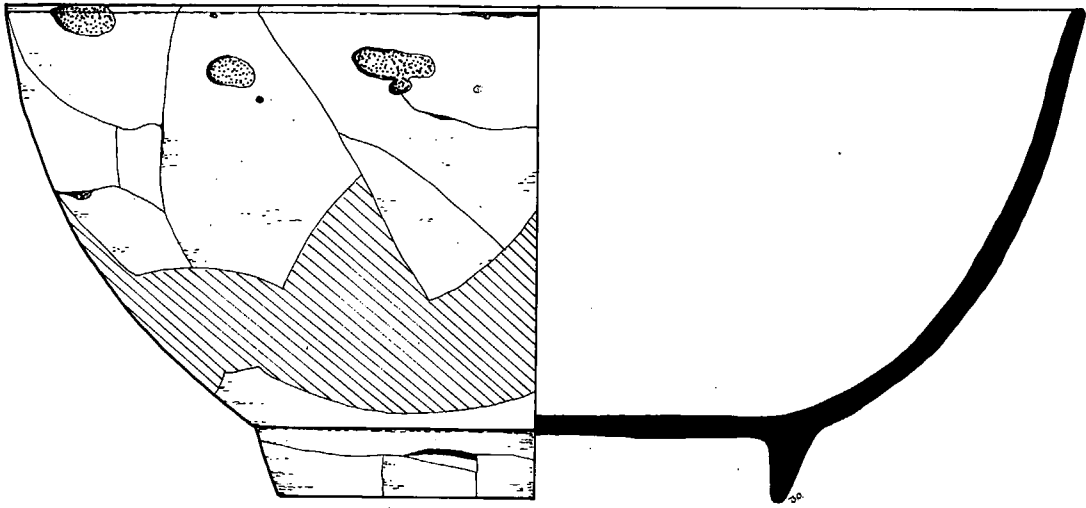


Figure 40

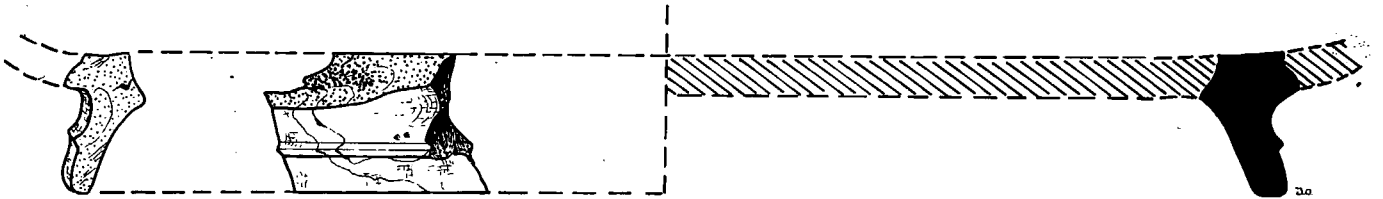
ENGLISH CREAM COLORED EARTHENWARE

Item A, Nos. 481, 1664, 1669, 1787, 1789, 1811, 1834, 1848, 1849, 1879, 1900 and 1926. This plain creamware bowl is 2-3/4" in diameter at its base. It is 3" in height and its rim diameter is 6".

Item B, No. 1738. A large creamware bowl or platter base. It had a base diameter of about 6-1/2".



A



B

Figure 40



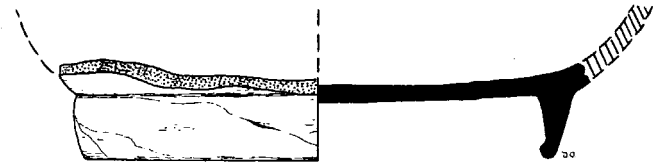
Figure 41

ENGLISH CREAMWARE AND PEARLWARE BOWL BASES

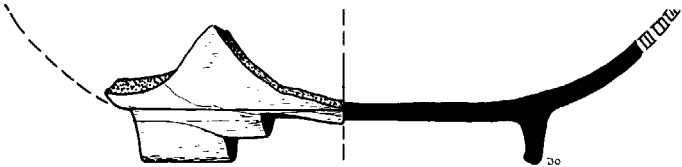
Items A-F, Nos. 1633, 476, 977, 1787, 853 and 1664. All of these bases with the exception of C and E are Creamware. Items C and E are Pearlware. Item A is smaller than the others and appears to be a tea bowl base. The creamware bowls presumably are all of a plain design and much similar to the restored bowl depicted in Figure 40, A. As far as can be determined, the Pearlware bowls were all decorated. The bowl heights with the exception of A would have averaged about 3" and such bowls would have been about 6" in diameter at their rims.



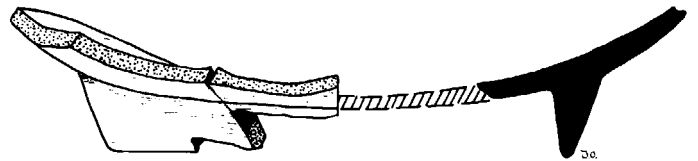
A



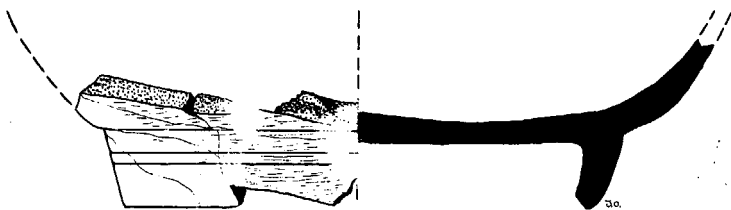
D



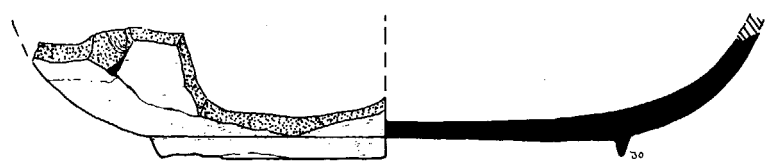
B



E



C



F

Figure 41



Group III. Pearlware

A total of 2,096 pearlware sherds representing a minimum of 28 vessels were recovered from the kitchen area at Grand Portage. Four hundred and eighty of these were undecorated body or base sherds that could not be assigned to specific vessels. Bowls are the only vessel form present, and in marked contrast to the creamware, every bowl is decorated. Vessel wall thickness ranges from 3/32 inch to 7/32 inch.

Pearlware was developed by Josiah Wedgwood, who introduced it to the English market in 1779. It was essentially an improved creamware with a white paste and a lead glaze to which a small amount of cobalt oxide was added to negate the yellow color of the lead glaze (Noël Hume 1970:128). Wedgwood himself was dubious of the marketability of his new product, but it quickly proved popular as an imitation of the then-fashionable Chinese export porcelain. The blue-tinted glaze closely matched the color of the oriental product and nicely complemented the cobalt blue chinoiserie found on many early pearlwares.

The date of the introduction of pearlware to North America can be determined with some accuracy. As has been noted, pearlware was first marketed in England in 1779. There would, of course, be some delay between the introduction of the ware to a home market and its export overseas. The Revolutionary War may have further delayed the export of pearlwares to the United States, but the ware was for sale in Virginia in 1783, the year the formal peace between England and her erstwhile colonies was signed (Noël Hume 1969a:922). The Revolutionary War may likewise have retarded the export of goods to Britain's loyal colonies

in North America, but it is perhaps not unreasonable to suggest that pearlwares could have made their appearance somewhat earlier in Canada (of which Grand Portage was then a part).

With respect to this problem, it is interesting to note that no pearlware has been reported at Fort Michilimakinac. The fort was occupied until 1780 and was dismantled during that winter and through 1781 (Miller and Stone 1970:18-19). Even if the few pearlware sherds that might possibly be present were confused with the creamware, no examples of the cobalt blue hand-painted underglaze chinoiserie or the feather-edge patterns typical of early pearlwares were recovered at Fort Michilimakinac. It seems then that pearlware did not arrive in North America until after 1780, and Noël Humes' documented date of 1783 could well be the earliest. Of course there would be an additional and possibly quite considerable time lag between the introduction of pearlware on the East Coast and its appearance in large quantities at the remote inland fur depot of Grand Portage.

Pearlware vessel base fragments are usually immediately identifiable on the basis of the color of the glaze in the body-foot juncture. Here the glaze is a light to moderate cobalt blue. On body sherds, when the glaze is more thinly distributed over the surface, pearlwares exhibit a range of very pale greens and blues approximated by Munsell 5G 9/1, 5G 8/1, and 10B 9/1.

Three techniques of decoration are found on pearlwares from Grand Portage: hand-painted, relief-decorated, and transfer-printed. Hand-painted decoration is found in both cobalt blue and polychrome. For complex hand-painted designs, such as the Chinese house motif

described below, the pattern was first stenciled onto the vessel in charcoal, to provide a guide for the decorator (Noël Hume 1970:129). Simpler designs, such as those illustrated in Fig. 44b-e, were probably done without the use of stenciled guides. Most horizontal design motifs were applied free-hand by touching a pigment-laden brush to a vessel as it was spun on a wheel.

Type A. Hand-painted, Cobalt Blue

Three distinct patterns hand-painted in underglaze cobalt blue are found on pearlware bowls from Grand Portage.

The first of these patterns (Fig. 42) is an English imitation of the house pattern found on Chinese export porcelain. From right to left around the vessel, the design consists of stylized mountains, a Chinese house surmounted by a cupola, a picket fence, a stylized tree, and leafy foliage. Underneath these components are five stylized water motifs. Similar hand-painted Chinese house patterns occur before 1775 on creamware, but appear to have been most popular on pearlwares predating 1805 (Noël Hume 1969a:392-393; 1969e, p. 24 (Fig. 22); 1970a, p. 129).

A total of 544 sherds bearing parts of this pattern were identified. The bowls represented by these sherds proved singularly difficult to reconstruct; therefore, both number of vessels and size are estimated. Thirteen individual "house" and 14 "circle over fence" motifs were identified; assuming that each appears twice on a vessel, a minimum of 7 vessels are represented. Maximum height of these vessels is about 3 inches, maximum diameter is close to 6 inches. The feet are very similar in height and cross-section to those found on the creamware

bowls, but measurable foot rings are slightly larger, about 3-1/4 to 3-1/2 inches in diameter. Several base fragments indicate decoration was also painted in the interior bottom.

A second pattern, probably another chinoiserie is found on a single bowl represented by 10 sherds. Size is indeterminate.

The third hand-painted cobalt blue pattern is also found in polychrome. The exterior pattern is best described by Fig. 43a; the interior is decorated by a single narrow blue strip located just below the rim and a simple 16-point rosette in the bottom. A total of 234 sherds of this pattern were identified, including portions of 3 interior rosettes, suggesting a minimum of 3 vessels. Total height of these vessels is about 2-1/2 inches; maximum diameter between 5 and 6 inches; dimensions of the feet are indeterminate.

An additional 127 small pearlware sherds decorated with cobalt blue could not be specifically assigned to any of the above patterns.

Type B. Hand-painted, Polychrome

Six different hand-painted polychrome patterns are found on 10 pearlware bowls. They are best described by reference to the cited figures.

The first pattern (Fig. 44a) is identical to the last-mentioned hand-painted cobalt blue pattern. A total of 304 sherds were identified, including portions of 4 bases. The horizontal and sinuous linear elements of this pattern are a greenish-brown (Munsell 5Y 3/4), the double "leaves" in green (Munsell 5GY 4/4), and the small crosses and the dots in each "berry" are cobalt blue. The rosettes in the interior bottom are cobalt blue and greenish-brown; the foot ring is embellished with a horizontal

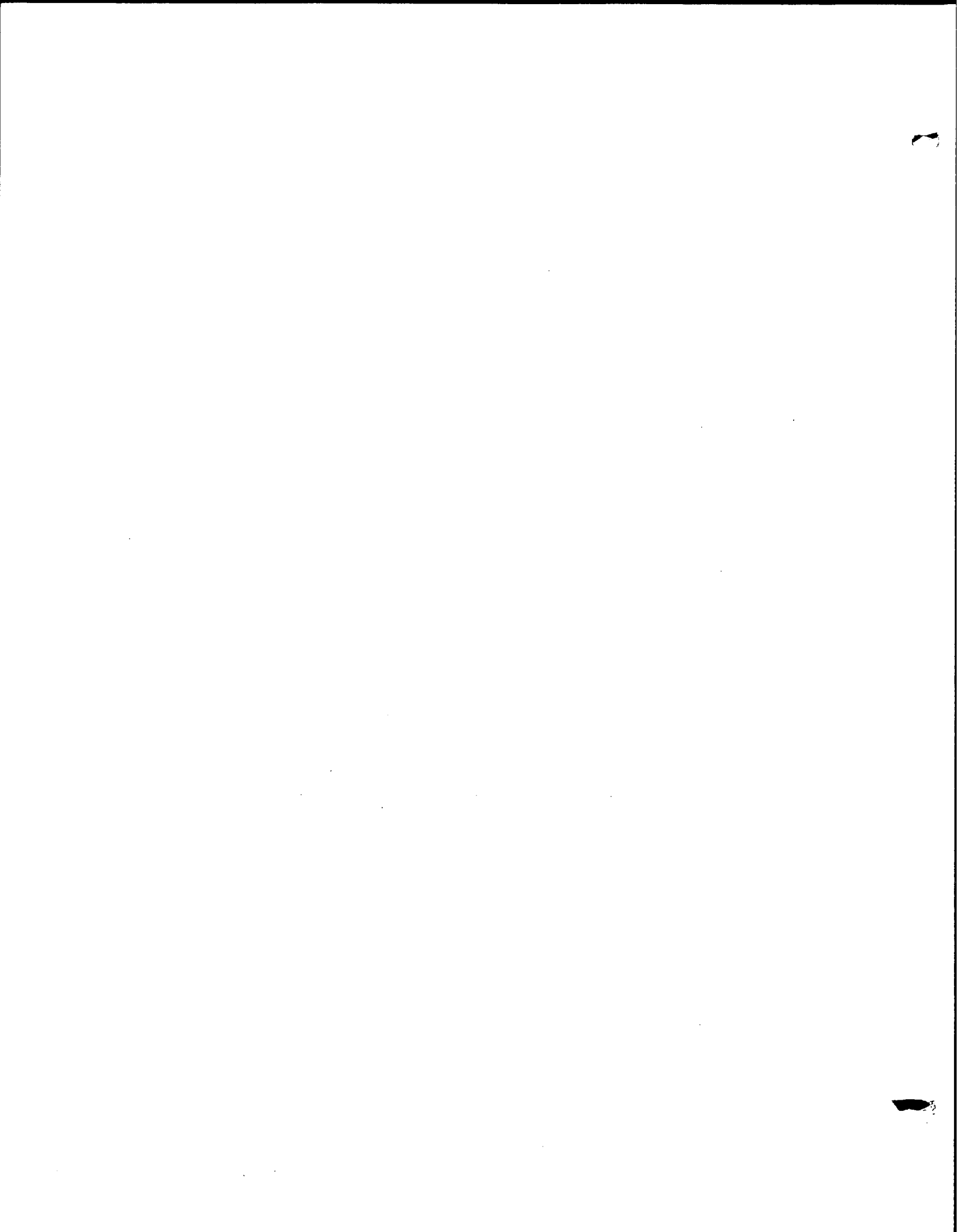
described below, the pattern was first stenciled onto the vessel in charcoal, to provide a guide for the decorator (Noël Hume 1970:129). Simpler designs, such as those illustrated in Fig. 44b-e, were probably done without the use of stenciled guides. Most horizontal design motifs were applied free-hand by touching a pigment-laden brush to a vessel as it was spun on a wheel.

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bowls, but measurable foot rings are slightly larger, about 3-1/4 to 3-1/2 inches in diameter. Several base fragments indicate decoration was also painted in the interior bottom.

A second pattern, probably another chinoiserie is found on a single bowl represented by 10 sherds. Size is indeterminate.

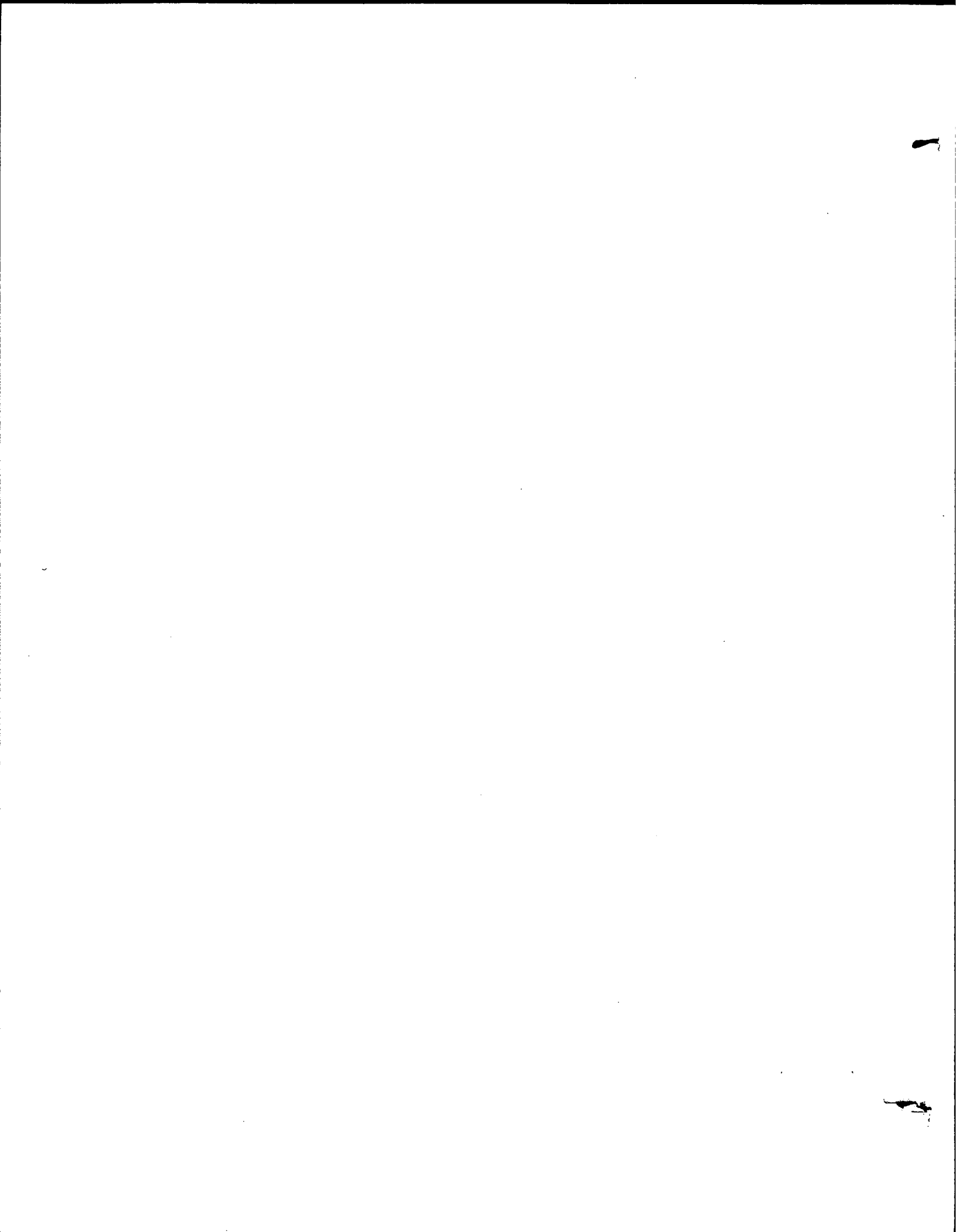
The third hand-painted cobalt blue pattern is also found in polychrome. The exterior pattern is best described by Fig. 43a; the interior is decorated by a single narrow blue strip located just below the rim and a simple 16-point rosette in the bottom. A total of 234 sherds of this pattern were identified, including portions of 3 interior rosettes, suggesting a minimum of 3 vessels. Total height of these vessels is about 2-1/2 inches; maximum diameter between 5 and 6 inches; dimensions of the feet are indeterminate.

An additional 127 small pearlware sherds decorated with cobalt blue could not be specifically assigned to any of the above patterns.

Type B. Hand-painted, Polychrome

Six different hand-painted polychrome patterns are found on 10 pearlware bowls. They are best described by reference to the cited figures.

The first pattern (Fig. 44a) is identical to the last-mentioned hand-painted cobalt blue pattern. A total of 304 sherds were identified, including portions of 4 bases. The horizontal and sinuous linear elements of this pattern are a greenish-brown (Munsell 5Y 3/4), the double "leaves" in green (Munsell 5GY 4/4), and the small crosses and the dots in each "berry" are cobalt blue. The rosettes in the interior bottom are cobalt blue and greenish-brown; the foot ring is embellished with a horizontal



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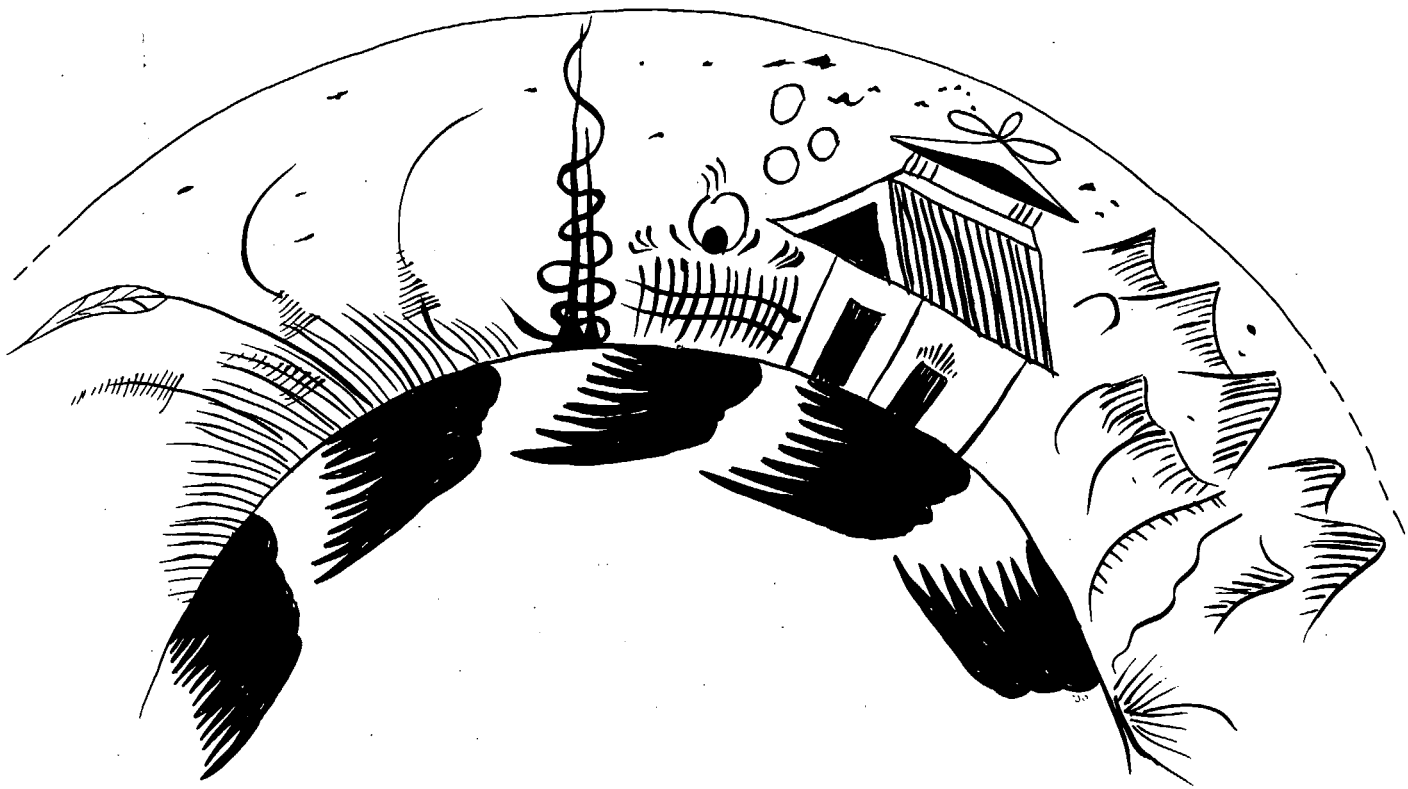
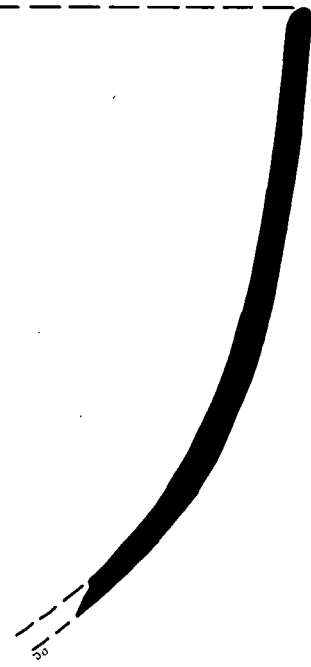
Figure 42

ENGLISH WHITE EARTHENWARE (Pearlware)

- Item A. A partially restored pearlware bowl which is decorated with a design of an Oriental nature. This bowl was approximately 3-1/2" deep and about 5-1/2" in diameter. It had wedge shaped feet. The design consists of stylized mountains, a Chinese style of house, a picket fence, a tree, and foliage. Underneath these components is a stylized depiction of water. There are from six to eight similar bowls in the collections from the Kitchen building. An X 2 enlargement.
- Item B. An enlarged depiction of the Orientally inspired design motif on these pearlware bowls. An X 4 enlargement.



A



B

Figure 42



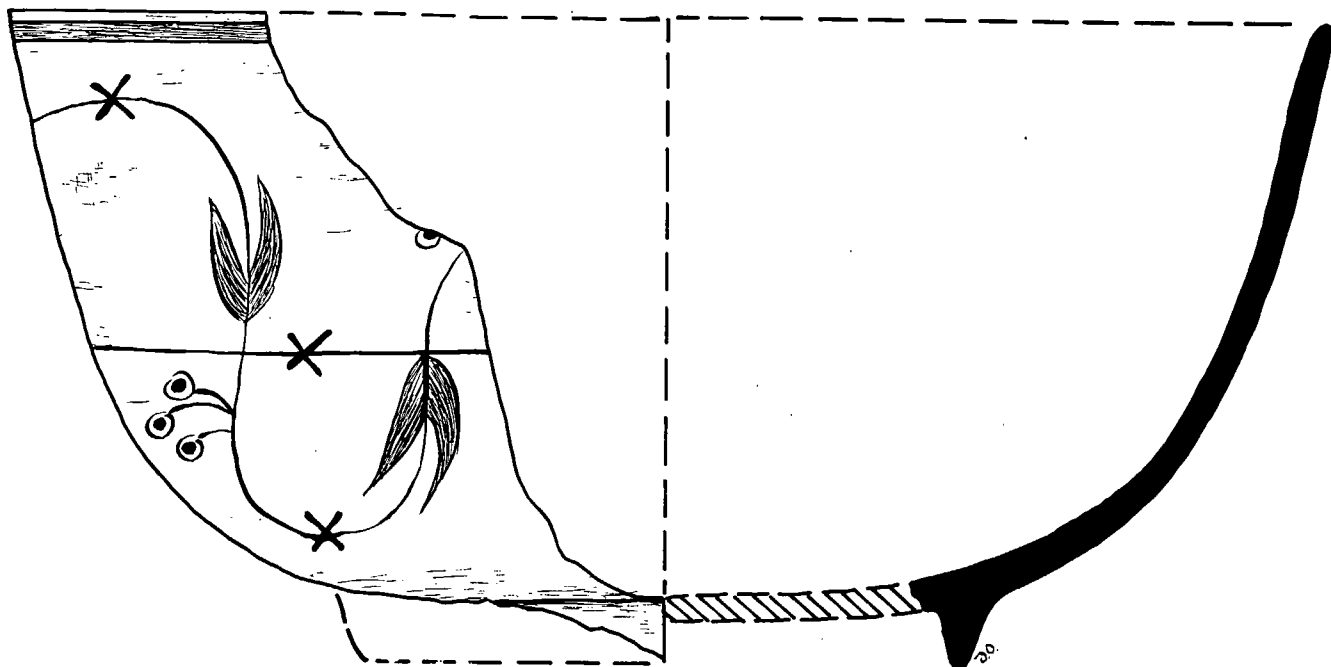


Figure 43

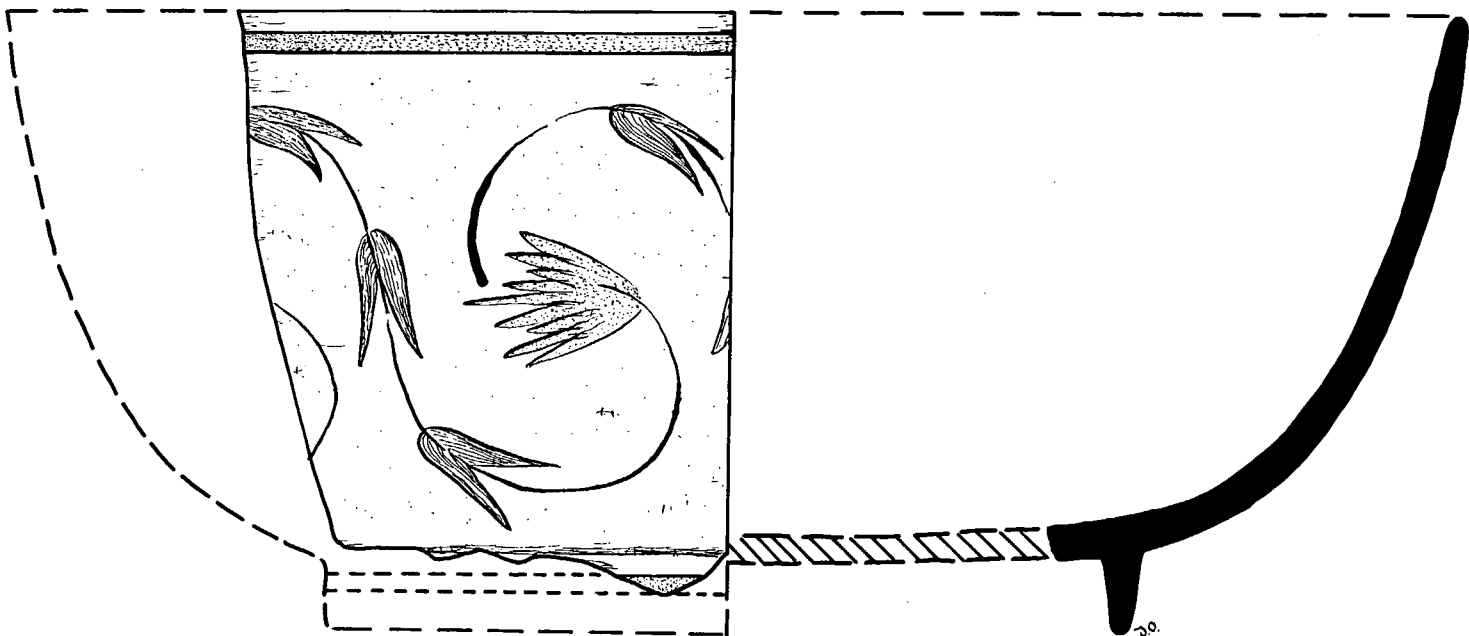
ENGLISH WHITE EARTHENWARE (Pearlware)

Item A, Nos. 613 and 1763. A pearlware bowl with a floral underglaze design in blue. The design elements consist of an interior and exterior blue band just below the rim and a curved line which repeats itself in a "wave" pattern of peaks and troughs. Attached to the curved line are blue leaves, blue berries and blue "X's". The design repeats itself a number of times around the circumference of the bowl. This bowl was approximately 5-1/2" in diameter and 2-1/2" in height.

Item B, No. 605. A pearlware bowl with a multi-colored design of a floral style. The design elements consist of an interior and exterior gold band just below the rim and a curved line which repeats itself in a "wave" pattern of peaks and troughs. This line is blue. Attached to it are gold leaves and light green flowers. The design repeats itself a number of times around the circumference of the bowl. This bowl was approximately 5" in diameter at its rim, 3" in diameter at its base and about 2-1/4" in height.



A



B

Figure 43



greenish-brown stripe. These bowls have a total height of about 2-3/4 inches and a maximum diameter of 6 inches. One restored base has a foot ring 3/8 inches high and 3-5/16 inches in diameter.

The second hand-painted polychrome pattern (Fig. 43b) is found on a small bowl represented by 104 sherds. Maximum diameter of the vessel is 4-1/2 to 5 inches; height, about 2-1/4 inches. The sinuous linear design element is cobalt blue; the horizontal line on the exterior rim (repeated on the interior) and on the base is an ochrous yellow (Munsell 7.5YR 5/8) as are the forked "leaves" and the multi-pointed triangular element is green (Munsell 10Y 6/6).

The remaining 5 vessels are represented by rim or near-rim sherds only. All appear to be fragments of six inch bowls.

Fig. 44b. This vessel is represented by 38 sherds. Linear elements are brown (Munsell 10YR 3/4), the leaf-shaped elements, green (Munsell 5GY 5/6), and the small florets, tan and orange (Munsell 2.5Y 6/6, 7.5YR 5/8).

Fig. 44c. This vessel is represented by 86 sherds. The narrow horizontal and sinuous linear motifs are brown (Munsell 10YR 3/4), the broad horizontal band is yellow (Munsell 2.5Y 7/10), the floral elements are embellished with green (Munsell 7.5Y 4/6) and an ochrous yellow (Munsell 10YR 6/10).

Fig. 44d. This vessel is represented by 23 sherds. The linear elements of the decoration are brown (Munsell 7.5YR 3/4) embellished with green (Munsell 2.5GY 5/4), yellow (Munsell 10YR 5/8), and cobalt blue.

Fig. 44e. Two vessels bearing this pattern are represented by 15 and 1 sherds, respectively. The first vessel has a broad (3/4 inch)

band of dark olive-brown (Munsell 2.5Y 2/2) decorated with pale yellow stars (Munsell 5Y 6/6). A band of lighter olive-brown (Munsell 5Y 3/4) encircles the interior just below the rim. The second vessel has a somewhat narrower (5/8 inch) band of dark brown (Munsell 10YR 3/2) with greenish-yellow (Munsell 7.5Y 6/6) stars. A brown stripe circles the interior.

Twenty-two additional polychrome pearlware sherds not attributable to specific vessels are present.

Type C. Relief-decorated Pearlware

A minimum of four relief-decorated vessels represented by a total of 80 rim sherds were found in the kitchen area at Grand Portage. The relief decoration was produced by rolling an incised cylindrical roulette against the vessel while the paste was still damp. The resultant patterns are best described by Fig. 45a. The vessels were colored by application of green pigment (Munsell 10GY 5/6) to the relief bands. This color has "bled" into the surrounding glaze, lending a distinct pale green cast to the glaze. Some sherds show a double impression resulting from an overlap of the rouletting. In all instances the rouletted band is 1/4 inch wide.

Type D. Transfer-printed

Fragments of at least 3 pearlware vessels with underglaze cobalt blue transfer-printed designs were identified. Transfer-printing was used as early as 1787 to decorate pearlwares (Noël Hume 1969a:396). but was certainly far more common after 1800. As was the case for many hand painted pearlwares, Oriental porcelain patterns served as the model for many of the early prints.

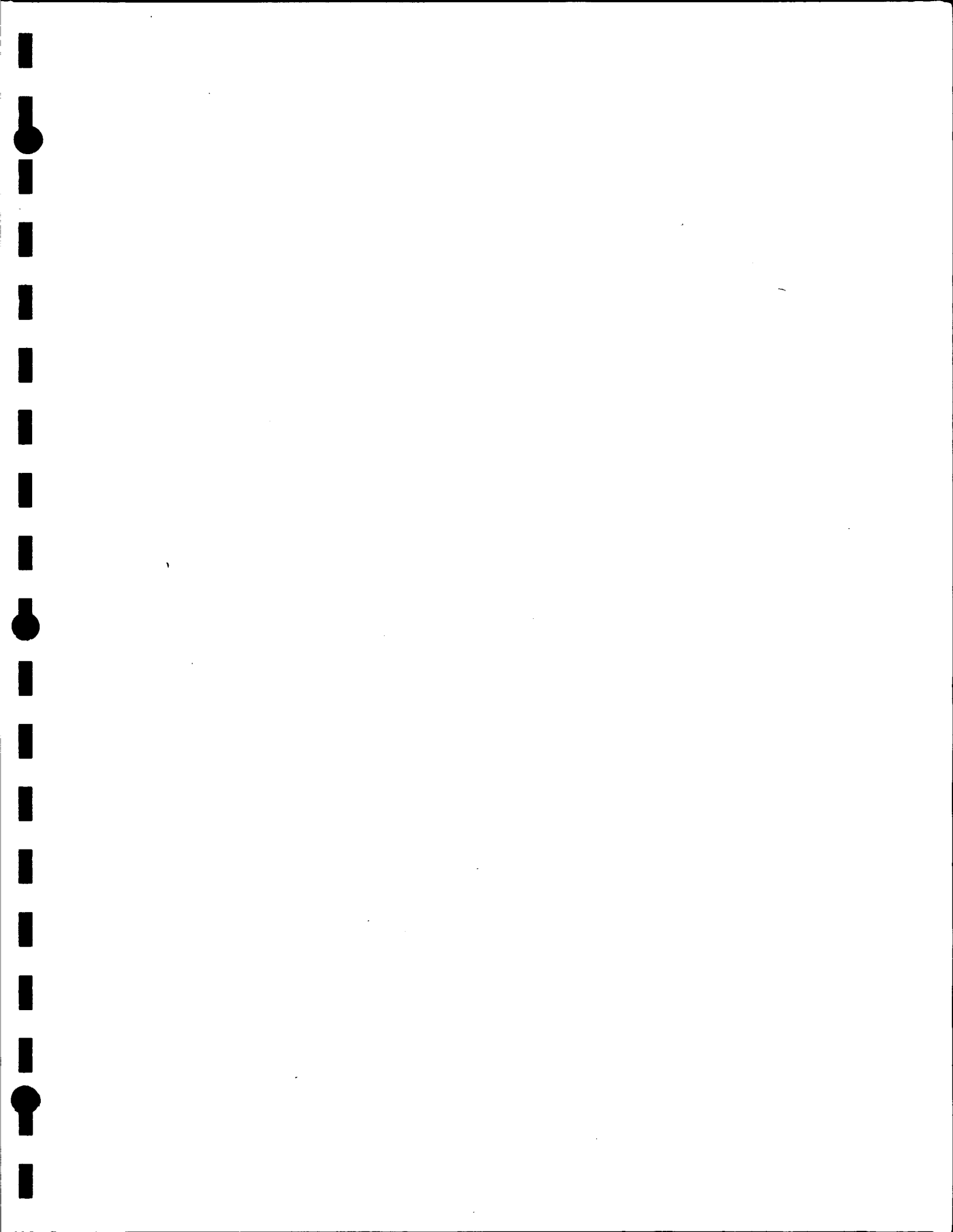


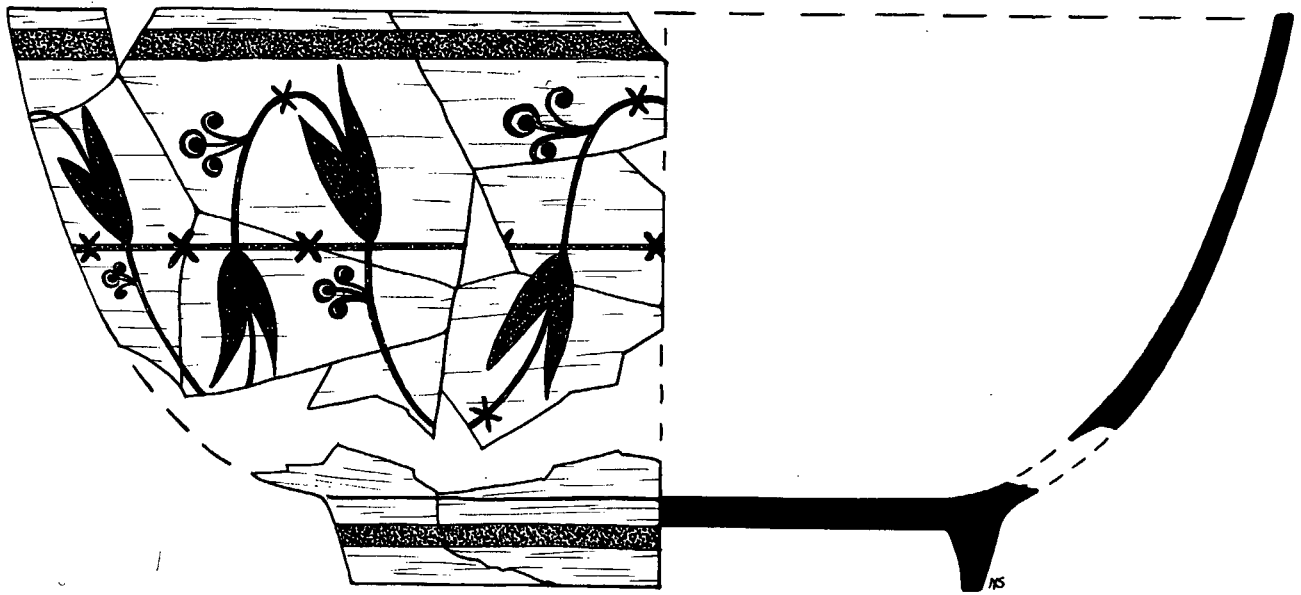
Figure 44

ENGLISH WHITE EARTHENWARE (Pearlware)

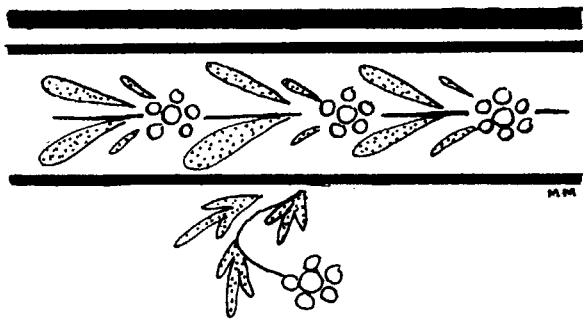
Item A, Nos. 784, 1181 and 1881. A pearlware bowl with a multi-colored floral design. The predominant color is green. The design element consists of an exterior and interior dark green band just below the rim and a curved line which repeats itself in a "wave" pattern of peaks and troughs. This line is green. Attached to it are medium green leaves and flowers which are composed of green outlines and blue interior dots. At intervals, the curved line is intersected by blue "X's". A green line runs around the center of the bowl and intersects the curved line. The foot of the bowl is decorated with a green band which is lighter colored than the band around the rim. The interior bottom of the bowl is decorated with a flower composed of blue and green elements. This bowl has a height of approximately 3" and a rim diameter of about 6". It has a base diameter of 3-1/8".

PEARLWARE BOWL DESIGN ELEMENTS

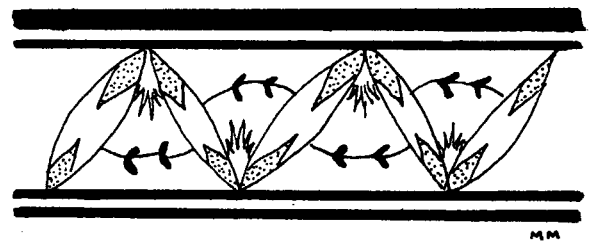
Item B is in brown, green, tan, and orange. Item C is in brown, yellow, and green. Item D is in brown, green, yellow and blue. Item E is brown with yellow stars.



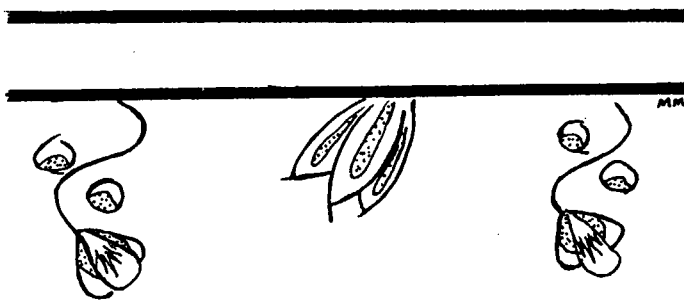
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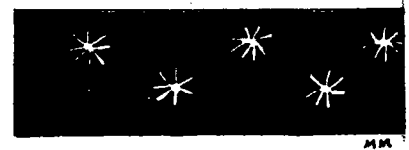
B



C



D



E

Figure 44



The first of these vessels, represented by 18 sherds, is a small bowl no more than 2-1/4 inches high and about 4-1/2 inches in diameter. No base or foot fragments were identified. The exterior is decorated with a finely printed landscape of oriental inspiration; the interior rim is printed with a diaper band beneath which there is a row of trilobate "club shaped" elements.

The second vessel, a small bowl of indeterminate size, is represented by four rim sherds. No decoration is present on the exterior; the interior is printed with a simple diaper band at the rim.

The third vessel is represented by only three sherds. The printing on these sherds is extremely dark, nearly black in places. The presence of decoration on both the interior and exterior of the sherds indicates that this vessel was probably a bowl, but both the pattern and dimensions are indeterminate.

Three additional sherds could not be attributed to specific vessels.

Group IV. Coarse Earthenwares

A total of 6 coarse earthenware vessels are represented by 179 sherds.

Four small jars are represented by a total of 161 sherds (Fig. 47a). The paste typical of these vessels is orange in color, untempered, and so soft as to be chalky. Sherd thickness ranges from about 1/4 inch near the base to as little as 3/32 inches at the neck. Portions of four bases and four mouths and shoulders were partially reconstructed, but it proved impossible to reconstruct a complete profile. A very similar vessel, but

missing the mouth, found in Pigeon River at Fort Charlotte permitted an accurate estimate of height to be made. The bodies of these jars are cylindrical, 3 to 3-1/8 inches in diameter. Total height is estimated at 4-1/2 inches. Outside diameter at the mouth is 2 inches, of the orifice 1-1/4 inches. All the vessels show a distinct "crease" at the shoulder. The vessels were hand thrown, as throwing rings are present on the interior, but the exteriors have been trimmed and smoothed. The interiors are fully glazed, the exteriors are glazed except for the bases and a half inch strip around the bottom. The glaze is poorly bonded to the paste and has exfoliated in patches. On three vessels the glaze is brown (Munsell 2.5YR 4/8 to 5YR 3/6), and on the fourth, a mottled yellow to brown (Munsell 10YR 6/8 to 5 YR 2/4).

The fifth vessel is represented by a single, thick sherd. The sherd is 5/8 inch thick, although one surface of the sherd is completely eroded away. The paste is orange with a soft, cellular, almost spongy texture. The paste appears to be heavily tempered with minute particles of fired shale, but this material may have been naturally present in the clay. The lead glaze is brown (Munsell 5YR 3/6). Form is indeterminate, but the vessel appears to have been quite large.

The last vessel (Fig. 49f) in this category is a small, rectangular-based vial represented by 17 sherds. The base measures 3/4 inch by 5/8 inch; total height is 2-5/16 inches, height to shoulder is 2-1/8 inches. The mouth is round or oval. Vessel walls are consistently about 3/32 inch in thickness. The unglazed exterior surfaces are reddish brown (Munsell 2.5YR 4/4) and fired almost to stoneware hardness. Where the surface has exfoliated, the soft porous

paste is pink in color. The interior and the neck and shoulder on the exterior are covered with a dark gray, rough, blistered lead glaze. Vertical striations on the exterior of the vessel and the lamination of the paste suggest this vessel may have been slip-molded and slid out of the form. The base was formed by applying a separate piece of clay to the bottom.

Class B. Stoneware

Stoneware differs from earthenware in that, while the paste is opaque, it is sufficiently vitrified to be completely impermeable to water. All but one of the stoneware sherds from the kitchen area at Grand Portage are salt-glazed. This glaze has a glassy, characteristically rough "orange peel" surface that is produced by placing salt in the kiln as the vessels are fired (Miller and Stone 1970:68).

Group I. English White Salt-glazed Stoneware

Two undecorated fragments of this stoneware were recovered from the kitchen area. The fine-textured paste is nearly pure white; the glaze is transparent. Sherd thickness ranges from 3/32 to 5/32 inches.

Miller and Stone (1970:68) note that English white salt-glazed stoneware "flourished. . . for a comparatively short period--roughly 1730-1770," after which it was supplanted by creamware. It appears, however, that this ware persisted longer in at least one specialized form. The two sherds found here could be reconstructed as a small, fairly deep cup-shaped vessel about 2-1/2 inches in diameter. A small English white salt-glazed stoneware cup found at a North West Company post (1804-1805) on the Snake River, Minnesota measures 2 inches in height and about 2-1/2 inches in diameter (Douglas Birk, personal communication). Other

similar examples have been found at Fort George and at Buckingham House, adjacent North West and Hudsons Bay Company posts (both occupied 1792-1800) on the North Saskatchewan River in eastern Alberta (Kidd 1970:127). It may be that these stoneware cups were favored for their durability by fur traders long after the ware had gone out of general use for tableware.

Group II. Brown Salt-Glazed Stoneware

Eleven sherds of brown salt-glazed stoneware were found in the kitchen area at Grand Portage. Seven of these sherds proved to be from a small wide-mouthed jar (Fig. 47b). Total height of this vessel is estimated at 4-1/2 inches. Diameter of the mouth is 3 inches; the shoulder, 3-3/4 inches; the base, 3-1/2 inches. Glaze on the top half of the vessel is a coarsely speckled brown grading to a mottled grey on the lower half. This piece is on display at Grand Portage and was not available for study, so details of paste cannot be given.

Three additional fragments are covered with a finely speckled medium brown salt glaze. The paste is heavily tempered with fine sand, giving the broken and unglazed interior surfaces a very gritty texture. The paste is buff to light grey, and the interior surfaces are distinctly reddish. One sherd is quite thin, 3/16 inches and bears a portion of an applique handle. Throwing marks on the interior indicate that the handle was vertically placed. This, along with the thinness of the sherd, suggests that it may be a portion of a globular vessel such as a jug. The other two sherds are thicker, 3/8 inches, suggesting a second, more substantial vessel, perhaps a globular storage container. The last sherd

in this group is 3/16 inch thick, similar in paste to the above sherds but with a buff exterior and grey interior.

Judging from Miller and Stones' description (1970:77), sherds of this general type were found at Fort Michilimackinac and are possibly German, but more probably of English origin.

Group III. Unglazed Red Stoneware

A single fragment of very fine-grained, hard English unglazed red stoneware was found in the kitchen area at Grand Portage. The sherd is 1/8 inch thick. The finely molded decoration is composed of gently curving horizontal bands of narrow, closely spaced ribs. Vessel form is indeterminate, but the 14 sherds of the same ware recovered at Fort Michilimackinac are all parts of teapots. This stoneware was manufactured in England from the end of the seventeenth century into the early nineteenth century (Miller and Stone 1970:77-80).

Class C. Porcelain

A total of 107 hard-paste porcelain sherds represent a minimum of 6 vessels. All sherds appear to be Chinese export porcelain; no soft-paste porcelain fragments are present.

Porcelain is a very hard vitrified ceramic with a translucent paste. Chinese porcelain was a popular tableware during the eighteenth century; large amounts were exported to England and North America.

Group I. Chinese Export Porcelain

Type A. Blue and White

A minimum of 5 Chinese export porcelain vessels with hand-painted cobalt blue underglaze decoration were found in the kitchen area

at Grand Portage. Vessel wall thickness ranges from about 1/16 inch at the rim on most vessels to 1/4 inch near the base on both reconstructed bowls.

The most complete vessel, a bowl, is represented by 32 sherds (Fig. 46b). The exterior is decorated with a typical "Chinese house" motif with water, islands, boats and a Chinese house in a garden. The bowl measures about 5 inches in diameter at the rim and about 3 inches in height. The foot is 2-7/8 inches in diameter and 1/2 inch high.

The second bowl (Fig. 45b), represented by 7 sherds, is similar in size and shape to the first bowl.

The third bowl in the sample is represented by 23 rim sherds. Some decoration was present on the exterior; the interior rim is bordered by a band of complex geometric patterns. Size is indeterminate.

The fourth vessel, represented by 17 sherds, is a shallow bowl with a diameter of about 5 inches and a total height of 1-1/8 inches (Fig. 46a). The foot ring is 3-1/4 inches in diameter and 3/16 inch high. Only the interior is decorated. A narrow band of simple cross-hatching bordered by thin lines circles the rim; a floral pattern is painted on the bottom.

The last vessel in this group is represented by two rim sherds. The vessel appears to have been fluted with a scalloped rim. Size and shape are indeterminate. Noël Hume shows similar bowls, (1962, p. 181).

Fifteen additional decorated body sherds and 10 undecorated sherds could not be assigned to specific vessels.

Type B. Polychrome

A single small body fragment bearing hand-painted pink overglaze decoration on both the interior and exterior was found. The pattern, shape, and size of the vessel are impossible to determine.

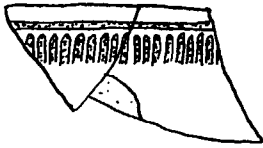


Figure 45

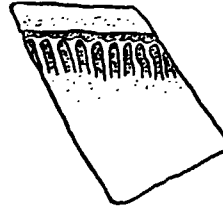
RELIEF DECORATED PEARLWARE AND PORCELAIN BOWL

Items A - D are representative of at least four relief-decorated pearlware vessels. These designs were made by application of a roulette against the vessels while the paste was still damp. A green pigment was applied to the relief bands and has bled into the surrounding area.

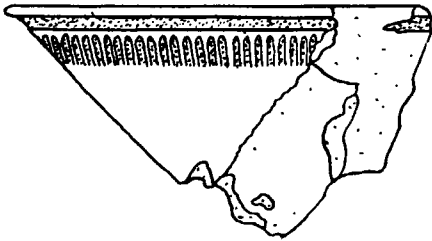
Item E, Nos. 243, 1336, 1368, 1533. Hard-paste Chinese export porcelain bowl with hand-painted underglaze cobalt blue decoration. The bowl measures 5-6 inches in diameter and 3 inches in height. A similar example of the paired scroll and floral motif found on the exterior of this vessel may be seen in Eighteenth Century Ceramics From Fort Michilimackinac (Miller & Stone 1970:84, Fig. 47j).



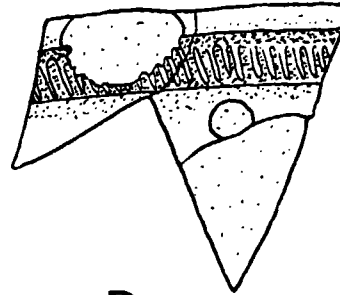
A



B



C



D



B

Figure 45



Figure 46

CHINESE EXPORT PORCELAIN BOWLS

- Item A. This shallow bowl has a foot ring $3\frac{1}{4}$ " in diameter and $\frac{3}{16}$ " high. Bowl diameter is approximately 5" and it is $1\frac{1}{8}$ " high. Only the interior is decorated. A narrow band of simple cross-hatching in blue is bordered by thin lines and encircles the rim. A floral pattern, also in blue, is painted on the bottom.
- Item B. This restored bowl has a foot ring $2\frac{7}{8}$ " in diameter and $\frac{1}{2}$ " high. The bowl is about 5" in diameter and about 3" high. The exterior is decorated in an under glaze cobalt blue with a typical "Chinese house" motif with a house in a garden, island, water and boats.

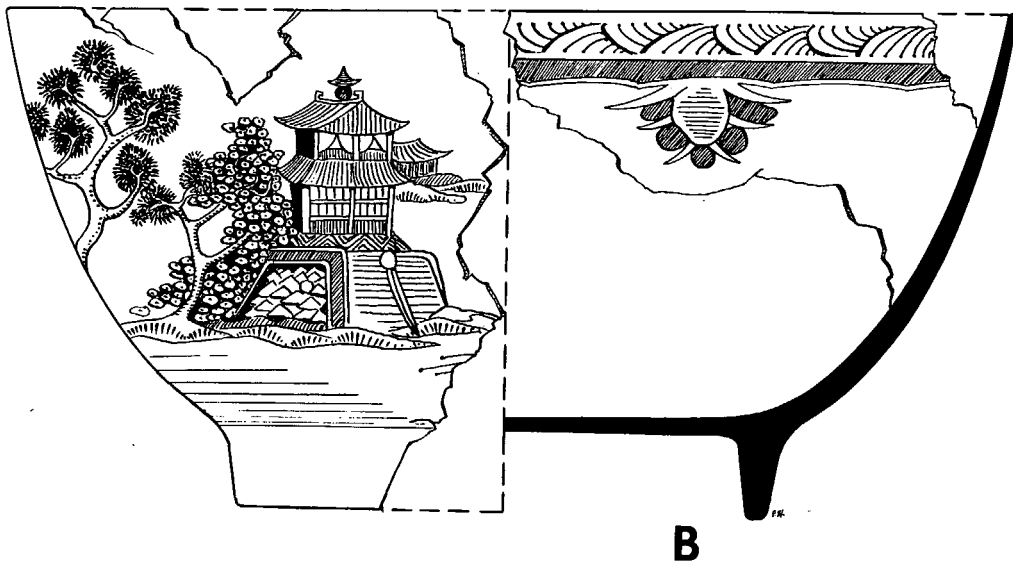
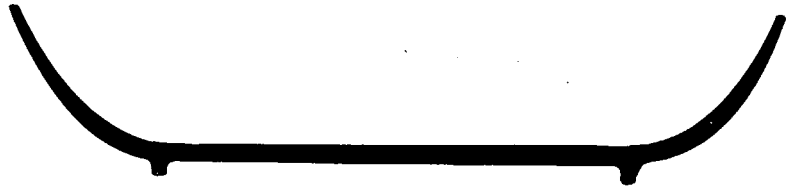


Figure 46



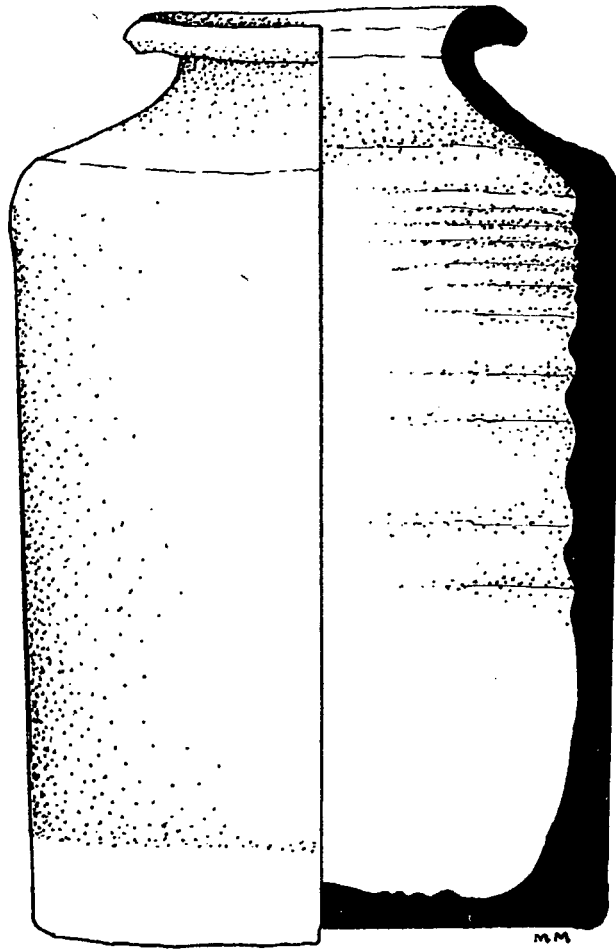


Figure 47

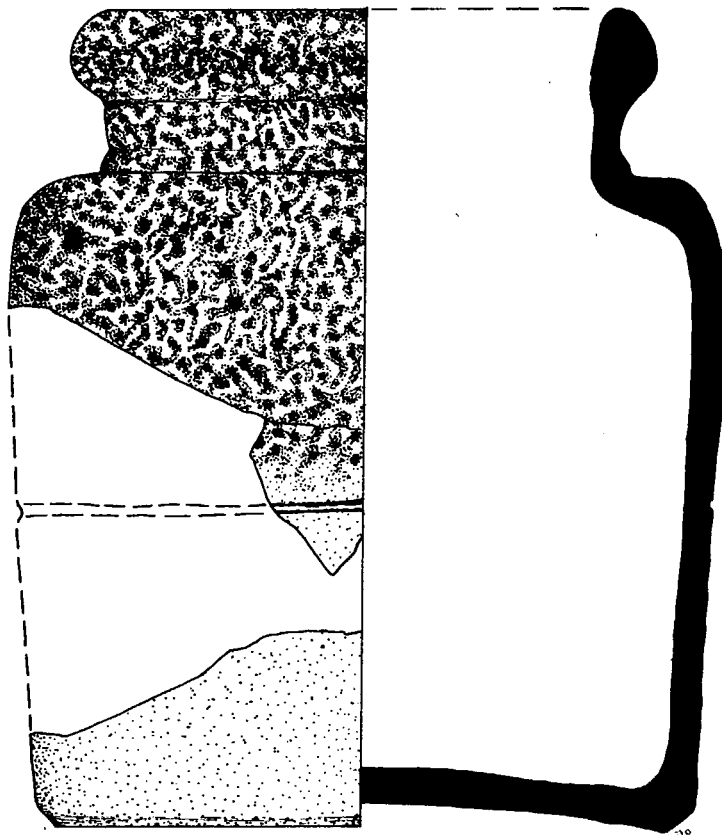
HOUSEHOLD GOODS: Earthenware and Stoneware Jars

Item A. This vessel is of a coarse earthenware. Four almost identical specimens were found. They were formed from an orange, untempered soft paste. These jars are approximately 3 inches in diameter and 4-1/2 inches high. Exterior mouth diameter is 2 inches. All of them were hand thrown, and the exteriors are trimmed and smoothed. Both interiors and exteriors are glazed. The exterior glaze is commonly brown and poorly bonded to the paste.

Item B, No. 1563. This vessel is of a brown salt-glazed stoneware. The glaze on the top half is a coarsely speckled brown which grades to a mottled gray on the lower portion of the jar. Basal diameter is 3-1/2 inches; height is 4-1/2 inches. Mouth diameter is 3 inches. An incised line runs around its center.



A



B

Figure 47



Grand Portage Ceramics--Conclusions, Comparisons, and Speculations

Although many of the same ceramic types appear at both Grand Portage and Fort Michilimackinac, the differing proportions at each site appear to be largely a function of the different periods of occupation. Sherd counts and percentages for both sites are presented in Table 6.

The near or complete absence of tin-glazed earthenware, fine earthenware, and English white salt-glaze stoneware at Grand Portage is definitely attributable to its later occupation. Miller and Stone observe that "delft wares were a mainstay of the English export trade in ceramics during the first three quarters of the eighteenth century" (1970:30). If Grand Portage is any measure, it was a negligible commodity in the last two decades of the century. Fine earthenwares (creamware with molded ornament and various colored glazes) are dated to ca. 1755-1775 by Miller and Stone (1970:63), and predate the major occupation at Grand Portage. As has already been noted, English white stoneware was unimportant after 1770, while pearlware was not introduced to North America until after the abandonment of Fort Michilimackinac.

Also, one other observation may reflect temporal difference. Despite the large creamware sample from Fort Michilimackinac, no examples of creamware hand-painted in underglaze cobalt blue were found there. This type is present both at Grand Portage (1 tea bowl) and in the underwater collection from Fort Charlotte (1 six-inch bowl), and may represent a type of decoration uncommon on creamware before 1780.

Certain characteristics of the Grand Portage ceramic assemblage may also be a function of the remoteness of the post from sources of supply.

TABLE 6

CERAMIC SHERD COUNTS & PERCENTAGES FROM
FORT MICHILIMACKINAC & GRAND PORTAGE

	<u>MICHILIMACKINAC</u>		<u>GRAND PORTAGE</u>	
	<u>Sherd Count</u>	<u>Percent</u>	<u>Sherd Count</u>	<u>Percent</u>
<u>CLASS I EARTHENWARES</u>				
Tin-Glazed - Total	4220	29.29	9	.27
Blue & White, Polychrome, Powdered Blue and Purple	(4071)			
Brown & White	(149)			
Creamware - Total	3549	24.63	923	27.73
Pearlware - Total	0		2096	62.98
Coarse Earthenware - Total	625	4.34	179	5.38
Fine Earthenware	113	.78	0	
<u>CLASS II STONEWARE</u>				
English White Salt Glazed	2465	17.11	2	.06
Rhenish Stoneware	73	.51	0	
Brown Stoneware	205	1.42	11	.33
Red Stoneware	14	.10	1	.03
<u>CLASS III PORCELAIN</u>				
Chinese Export Porcelain	3082	21.39	107	3.22
English	61	.42	0	
TOTAL CERAMICS	14407	99.99	3328	100.00

The East Coast colonies served as an intermediate source of supply for imported European and Chinese ceramics and as the primary source for the few coarse earthenwares and stonewares that were manufactured in North America (Miller and Stone 1970:51-59, 77). The cost of shipping these goods inland would be at least partly a function of distance.

In an effort to explore the effect of distance on the distribution of ceramics, the proportion of "tablewares" and "kitchenwares" at Grand Portage and at two other sites are compared. "Kitchenwares" include those coarser ceramics that would more likely be found in the kitchen. "Tablewares" are the finer ceramics that were generally manufactured in forms suited to the dining table. The working hypothesis is that kitchenwares, being relatively cheap and rather bulky, were less likely than tablewares to have been shipped great distances.

At Michilimackinac, the kitchenwares are considered to include coarse earthenwares, Rhenish and brown stonewares, and the brown and white tin-glazed earthenwares ("clearly intended for everyday kitchen and table use" [Miller and Stone 1970:38]). The remaining tin-glazed earthenwares (especially blue and white) were used not only for tablewares, but also for such things as chamber pots and drug jars (Miller and Stone 1970; Figure 12c, d). However, since no vessel counts are given, it is impossible to evaluate the importance of this component.

The published ceramic assemblage from a site much closer to the Atlantic Coast - Fort Ligonier, Pennsylvania - is presented in Table 7. Fort Ligonier saw a relatively permanent occupation by British troops between 1758 and 1766 (Grimm 1970:159-166, 10-11).

TABLE 7

CERAMIC SHERD COUNTS AND PERCENTAGES
FROM FORT LIGONIER, PENNSYLVANIA (1758-1766)

	<u>Sherd Count</u>	<u>Percent</u>
<u>TABLEWARES</u>		
<u>Earthenwares</u>		
Delft (Tin-Glazed)	1338	42.21
Creamware	8	.25
Fine Earthenware	73	2.30
"Jackfield"	8	.25
<u>Stoneware</u>		
English White Salt-Glazed	793	25.02
<u>Porcelain</u>		
Chinese	582	18.36
English	54	1.70
<u>KITCHENWARES</u>		
<u>Earthenwares</u>		
Coarse Earthenware (Redware, Slipware)	260	8.20
<u>Stoneware</u>		
Brown Salt-Glazed	13	.41
German	41	1.29
Total	3170	99.99

When the "kitchenware" and "tableware" sherd totals are converted to percentages (Table 8), it will be seen that the proportion of "kitchenwares" decreases as the distance from the Atlantic Coast increases.

TABLE 8
TABLEWARE AND KITCHENWARE FREQUENCIES AT GRAND PORTAGE,
FORT MICHILIMACKINAC AND FORT LIGONIER

<u>SITE</u>	<u>TABLEWARE</u>	<u>KITCHENWARE</u>
Grand Portage	94.3%	5.7%
Fort Michilimackinac	92.7%	7.3%
Fort Ligonier	90.1%	9.9%

Evidently, tablewares were considered less dispensable than kitchenwares, which were increasingly excluded as the distance (and cost) of shipping goods increased. No doubt many ceramic kitchen utensils could be adequately replaced with wood or birch bark basketry containers made or obtained locally, or with more durable metal vessels such as pewter and the familiar and ubiquitous brass kettle.

The results presented in Table 8 are only suggestive, because these sites are not really comparable in terms of period, length, or type of occupation.

The remoteness from sources of supply may also account for another peculiarity of the "tableware" assemblage at Grand Portage--the preponderance of bowls (Table 5). Although vessel counts are not available for either Fort Michilimackinac or Fort Ligonier, it is apparent from the descriptions and photographs that for the tableware, the full-range of functional types are present at both sites. It may be that the cost of bringing in goods to Grand Portage was so great that only the most functionally generalized type of tableware was imported.

However, it should be noted that the North West Company maintained a fleet of schooners on the Great Lakes. At least one schooner served Grand Portage before 1793 and possibly as early as 1787 when cattle, horses, and sheep are noted at the post (Thompson 1969:66, 53). In 1800, the Otter brought sawn lumber from Sault Ste. Marie (Thompson 1969:100). It seems, then, that had they been required, the facilities were available to import the full-range of tablewares. The logistical problems of transporting ceramics to Fort Michilimackinac must have been nearly as great, yet, as has been noted, the complete household inventory from chamber pots to punch bowls is found there.

I propose that both preponderance of bowls and the scarcity of Chinese porcelain is a function of the impermanent and non-domestic nature of the occupation at Grand Portage.

Since I have not made a detailed study of the available information of the North West Company, many of the following arguments can be considered only logical rather than demonstrable and are subject to confirmation (or disconfirmation) by more diligent and knowledgeable scholars of the fur trade.

It would appear that the ceramic tablewares recovered at Grand Portage were the property of a very restricted part of the population at the site. Miller and Stone (1970:44, 63, 66, 70, 99, 100) suggest that at Michilimackinac only the wealthier classes (by local standards)--military officers and "more affluent civilians"--possessed any quantity of tablewares.

The analogous class at Grand Portage would include only company officials and perhaps the resident clerks. The great majority of the

transient and semi-permanent inhabitants--the voyageurs--would have altogether dispensed with ceramic tablewares as unsuited to the rigors of canoe travel.

However, even for the resident "upper class," Grand Portage was more a place of business than a scene for permanent domestic life. Nowhere is there a suggestion of the kind of refined domestic living such as appears to have been the case at Michilimackinac. Furthermore, it appears that the rate of turnover of resident personnel was fairly high, suggesting that few would have considered their tenure at the post to be anything but temporary.

Therefore, it is here argued that those individuals who deemed it proper to eat off ceramic tablewares brought in only the most useful functional type--bowls--which could be used for both solid and liquid food. At Fort Michilimackinac, the requirements of permanent domestic life, as well as some concern for social status, warranted the importation of the full range of tablewares.

It is in this context that the scarcity of Chinese porcelain at Grand Portage may be understood (Table 9). The relatively high proportion of Chinese export porcelain at both Fort Michilimackinac and Fort Ligonier indicates that this ceramic was not particularly expensive.

TABLE 9

CHINESE EXPORT PORCELAIN PERCENTAGES

<u>SITE</u>	<u>% OF TOTAL</u>	<u>% OF "TABLEWARE"</u>
Grand Portage	3.22	3.42
Fort Michilimackinac	21.4	23.1
Fort Ligonier	18.4	20.4

Miller and Stone indicate that at Fort Michilimackinac "tea services or part tea services constitute approximately 90 percent of the Chinese porcelain found. Several large punch bowls and a few dinner plates represent the other forms encountered" (1970:81). It appears, then, that the ware is scarce at Grand Portage because most of the functional forms in which it was produced were not in demand by the residents of the site for reasons that have been suggested.

Finally, it is perhaps appropriate to note that these conclusions are based on the ceramic sample from a single structure at Grand Portage. Further excavation of other buildings may yield additional ceramics that could radically change the nature of the assemblage and warrant a re-evaluation of the ideas presented above.

TABLE 10

SYNOPTIC OUTLINE OF GLASS STORAGE CONTAINERS
FROM THE GRAND PORTAGE KITCHEN STRUCTURE

by Edward U. Lofstrom

(Figures 48-51)

<u>JARS</u>	
Large Olive-Green Square Based Jars	2
	<hr/> 2
<u>BEVERAGE BOTTLES</u>	
Large Olive-Green Square Based Bottles	2
Large Clear Glass Square Based Bottles	
Lead Glass	14
Soda Glass	2
Large Blue-Green Square Based Bottles	3
Olive-Green Cylindrical Bottles	
Large	4
Small	2
"Lime-Green" Cylindrical Bottles	1
	<hr/> 28
<u>SMALL BOTTLES</u>	
Small Cylindrical Bottles	6
Small Square Based Bottles	
Plain	8
Embossed "Essence of Peppermint"	5
Small Rectangular Based Bottles	
With Fluted Corners	15
Without Fluted Corners	3
Embossed "Turlington" Bottles	5
	<hr/> 42
	<hr/>
Total Glass Storage Containers	72

Also present were approximately 60 clear glass drinking tumblers. Thus, the total number of glass containers recovered at the site is 142.

Glass Containers from the Kitchen Structure at Grand Portage

(Figures 48-51)

As was the case for the ceramics, the kitchen structure at Grand Portage was found to contain a large majority of the glass bottle fragments recovered to date from the site. However, it proved difficult to determine accurate sherd counts of the material for two reasons. First, it was found that in some cases bottles of different shapes and capacities were manufactured from the same color of glass. Accurate counts for particular types could not be made. Second, there was found in the collection a small but significant quantity of late nineteenth and twentieth century glass. Rim and base sherds were easily sorted out, but body sherds were not. The vessel count given here is an absolute minimum.

Manufacturing Techniques

All of the eighteenth century bottles recovered from the Grand Portage kitchen area were individually hand blown; either free-blown or mold-blown.

Free-blown bottles were produced without the aid of molds. Round cross-section bottles were form-shaped by rolling the unformed bottle on a marver (a stone slab or metal plate); flat-sided vessels were shaped by slapping the bottle against the marver or with a battledore (a wooden paddle) (Munsey 1970:31).

Two types of molds were employed to form mold-blown bottles. Dip molds are single-piece, open top molds that form the vessel up to the shoulder. Dip molded vessels are distinguishable by their relative symmetry, and on some bottles, by the presence of a blow-over. This is a distinct bulge at the shoulder which occurs when the body of the bottle

is taller than the mold and expands over the top of the mold (Munsey 1970:38).

Two-piece molds were hinged at the bottom, allowing the mold to be opened after the vessel was formed. This arrangement permitted the bottle to be molded to the full height of the neck (Munsey 1970:39). These vessels are clearly identifiable by the presence of diagonal mold seams running across the base. Several necks from Grand Portage exhibit vertical mold seams running to the full height of the neck.

After the vessel was shaped, the base was indented and a pontil secured to the base. Four distinct methods of forming the basal indentation (push-up, kick, or kick-up) and three techniques of empontilling are identifiable on Grand Portage bottles. The discussion of these techniques is based directly on Olive Jones' article "Glass Bottle Push-ups and Pontil Marks" (1971).

Push-ups may be roughly divided into the categories of "deep" and "shallow." Four large, cylindrical olive-green "wine" or "rum" bottles from Grand Portage have deep, cup-shaped push-ups that lack distinct tool marks. Jones suggests that similar push-ups found on French "flower-pot" wine bottles may have been formed by the use of a mollette. A second distinctive tool was used to form the push-up on two small cylindrical olive-green bottles. Jones describes this tool as "a circular iron rod, like a pontil, with the working end split into quadrants The separated quadrants left a quatrefoil impression in the top of the push-up" (1971:66).

The majority of the glass storage containers from Grand Portage have relatively shallow push-ups. On many this was formed with a thin pointed tool. In cross-section, the push-up is conical with a sharply pointed tip. Frequently this push-up was deformed by the application

of the pontil, but is identifiable by the presence of a small conical pit under the pontil scar. Finally, several bases were apparently indented during empontilling.

The function of the relatively deep push-ups found on "wine" or "rum" bottles is uncertain (Jones lists several possibilities). The shallow push-ups apparently were formed so that any glass left from the pontil would not interfere with the stability of the bottle when placed on a flat surface.

The pontil is an iron rod or tube secured to the base of the vessel with molten glass. Three types of empontilling described by Jones are present on Grand Portage bottles; each is identifiable by the characteristic scar left when the pontil was detached.

The glass-tipped pontil is simply a pontil tipped with a blob of glass. The scar is a solid patch or lump of glass, or a concoidal piece of glass is removed from the base. The sand pontil is a glass-tipped pontil dipped in sand to prevent it from adhering too firmly to the base. Ideally, the scar is a circular patch roughened by grains of sand or flecks of glass that stick to the base. On bottles with deep push-ups, the sand pontil is often evidenced by a band of roughened glass on the sides of the push-up. Depending on the amount of sand on the pontil, the sand pontil scar may approach the glass-tipped pontil scar in appearance.

The third technique of empontilling is simply to use the detached blowpipe as pontil. This leaves an annular scar or tubular fragment of glass in the push-up.

Necks and lips were finished in a variety of ways. The simplest is to leave the neck straight, merely fire-polishing the end. The lip could be tooled into a flaring mouth, or into a right angle rim. This

latter form, in cross-section, presents a broad, flat rim lying at a right-angle to the neck. A variant on the angled rim is the "folded right-angle rim" in which the lip was tooled out and folded back onto the top of the flat rim. This type is clearly distinguishable by the presence of an annular bubble trapped in the fold near the outer margin of the rim. Finally, the lip could be finished by the application of a strip or string of glass at or just below the rim.

Description

Glass color will be described using Munsell color terminology. It should be recognized that glass color varies with the thickness of the sherd, so the colors listed will be "average." Color was determined by holding the sherd about six inches from a well-lit sheet of white paper.

Lead glass was identified by using short wave ultra-violet light, as described by Jones (1972). She notes that "Glass containing lead fluoresces to a distinctive ice-blue color which can be confused with other colors, such as purple, but in comparison can easily be picked out" (1972:108). Comparison was made with a modern sherd of lead glass to confirm identification.

All measurements are in inches. Three or four digit catalogue numbers should be understood as prefixed by "21-CK-6 1970." Hyphenated catalogue numbers are complete. The catalogue numbers refer to the major base or neck sherd.

The glass storage containers have been divided into three categories: Jars (wide-mouth vessels), Beverage (liquor) Bottles, and Small Bottles, which appear for the most part to have contained medicinal or non-beverage liquids or powdered solids such as snuff and spices.

JarsLarge Olive Green Square Based Jars

Two olive-green (Munsell 10Y 6/4), square based jars were represented by portions of the bases and necks. The base (547) of the more complete example measures 3 inches square. The blowpipe was used as pontil, the push-up (1/2 inch deep) appears to have been formed during empontilling. The shoulder is rounded, measuring 3-5/8 inches in the one preserved dimension. At the greatest constriction, the neck (1333) measures 1-11/16 inches in outside diameter (Fig. 49a). The lip is flared and slightly rolled, measuring 1-7/8 inches in diameter, the orifice, 1-1/4 inches in diameter.

The second vessel is too fragmentary to obtain direct measurements of either the base (1842) or neck (1630), but appears to be metrically almost identical to the above vessel. The shallow push-up on the base was formed during empontilling; a sand pontil was used.

Both vessels were dip-molded.

Beverage BottlesLarge Olive-Green Square Based Bottles

Portions of the base, shoulder and neck of a large, square based, olive-green (Munsell 5GY 7/4) bottle were found. The base (496) measures 3-5/8 by 3-7/8 inches; the push-up is shallow (1/2") and conical; a glass-tipped pontil was used. The shoulder is rounded and the top of the shoulder is relatively flat. The neck (546) is straight, only 1 inch high and 1-1/4 inches in diameter. A flat string rim 1/4 inch high was applied 1/4 inch below the lip. The interior of the neck was intentionally ground to receive a stopper; the orifice measures 11/16 inches in diameter.

A second vessel of the same color glass is represented by a base (1024) that measures 3-1/2 inches square (Fig. 51b). The push-up is no more than a shallow depression (3/16 inches) formed during empontilling. A sand pontil was used.

Both vessels were dip-molded.

Large Clear Glass Square Based Bottles

At least 14 large, clear lead glass, square based bottles were represented by fragments of bases. Only 4 bases were sufficiently reconstructed so that basal dimensions could be obtained. One (355) measures 3-3/4 inches square, 2 (336-5-7, 497) measure 3-5/8 by 3-1/2 inches, and 1 (1598) measures 3-1/2 inches square (Fig. 51a). The push-ups are relatively shallow (1/4 to 3/8 inches); at least four were formed by a thin pointed tool, while six appear to have been indented during empontilling. In all cases a glass-tipped pontil was used.

Only eight necks could be associated with these bases. The shoulders are flat and slightly conical. The necks are short (5/8 to 1 inch) and finished in two ways. Four lips are tooled into a simple right angle rim (Fig. 48b), while on three the same effect was produced by applying a round cross-section string of glass at the lip (Fig. 48c, f).

TABLE 11

NECKS FROM LARGE SQUARE-BASED LEAD GLASS BOTTLES

Rim Form	Catalog #	Height Neck	Diameter Neck	Diameter Rim	Diameter Orifice
	721	3/4	1-3/16	1-13/16	3/4
Right-Angle	768	11/16	1-1/4	1-15/16	13/16
	405	11/16	1	1-9/16	1/2
	1063	5/8	-	-	-
	1446*	1	-	-	-
String At Lip	1513	1	1	1-1/2	5/8
	1828	-	-	-	-
(Rim Missing)	406	-	15/16	-	-

*not available for study

These vessels may have been free-blown. The bases show the fine pitting caused by contact with cold metal, but the side walls do not, being relatively smooth.

Brown classifies similar vessels from Fort Michilimakinac as decanters (1971:124-125). Noël Hume suggests that these bottles served both as decanters and as storage bottles "that were stored in cases and were commonly used as containers for gin or medicines" (1970:202).

Two similar clear soda-glass square bottle bases were unquestionably dip-molded. One base (1254) measures 3 inches by 3 inches and is slightly rhomboidal; the second (336-6-13) measures 3-1/8 inches in the one preserved dimension. On both, the push-up was formed during empontilling with a glass-tipped pontil.

Large Blue-Green Square Based Bottles

Two square based blue-green (Munsell 2.5BG 8/2) glass vessels were represented only by base fragments. Both bases (1429, 336-4-11) measure about 2-5/8 inches square. The push-up (3/8 inch deep) was formed with a pointed tool; on one example the tool impression is so badly off center that the basal depression was actually formed during empontilling. A glass-tipped pontil was used on both.

These are probably French liquor bottles (Brown 1971:108). Examples from both Fort Michilimackinac (Brown 1971:145, Fig. 1b) and the underwater collection at Fort Charlotte indicate that these bottles had straight, tubular necks and a capacity of about 24 ounces.

Olive-Green Cylindrical Bottles

Two sizes of cylindrical olive-green (10Y 7/4) glass bottles are represented by a minimum of six bases.

One large bottle was reconstructed to the height of the neck.

The base (739) measures 3-7/8 inches in diameter. The push-up is deep (1-3/8 inches) symmetrical and may have been formed by a mollette. A sand pontil was used. The lower margin of the hemispherical shoulder is defined by a distinct blow-over. The height of the vessel to the blow-over is 4-1/4 inches; to the base of the neck, 6-1/4 inches.

A second bottle (1662) measures 3-5/8 inches in diameter at the base (Fig. 51g). The push-up measures 1-3/8 inches deep; a sand pontil was used. To the bottom of the blow-over, the vessel measures 5-1/4 inches; to the base of the neck, an estimated 7-1/4 inches.

Base fragments of at least two other bottles appear to be generally similar to the two described above.

Two smaller bottles are represented by one complete and one fragmentary base. The complete base (1558) measures 2-9/16 inches in diameter and retains a clear quadrilobate mark left by the tool used to form the push-up (Fig. 51j). The push-up is 3/4 inches deep; a sand pontil was used. The second base (1559) is virtually identical. Shoulder fragments that are almost certainly from these vessels exhibit a distinct blow-over and a hemispherical shape.

There are four olive-green rims that could be attributed to any of the above six bases. On three of these (592, 737, 1453), the lip is slightly flared or rolled with a string rim applied about 1/4 inch below the lip (Fig. 48d, h).

Orifice diameter ranges from 1/2 to 5/8 inches. Additional sherds indicate that necks were tubular to slightly bulging.

These vessels are the familiar English "wine" or "rum" bottles. The larger based bottles probably held about a fifth of a gallon, while

the two smaller bottles are probably 12 ounce "half-bottles" (Brown 1971: 101, 112, 140).

The fourth olive-green rim sherd (336-4-14) is somewhat anomalous. The orifice is large, estimated at 1-1/8 inches in diameter, and the lip is finished with a broad applied collar about 1/2 inch high. There is no distinct tubular neck; rather, the neck expands gradually toward the shoulder. As no other sherds could be definitely associated with this neck, no comments can be made about the shape of the body.

Small Bottles

The remaining bottles from the kitchen structure may be generally characterized as "small," all apparently having a capacity of less than half a pint. Four groups are recognizable: small round sectioned bottles and vials; small square-based bottles; small rectangular bottles, most with fluted corners; and the familiar "Turlington" bottles.

Small Cylindrical Bottles

Two round-section blue-green (Munsell 5G 8/2) bottles and two vials are represented by four bases and 2 necks. The largest base (1544) measures 2-1/8 inches in diameter; the push-up (7/8 in. deep) was formed by a sharply pointed tool; a glass-tipped pontil was used (Fig. 51i). The associated neck fragment (723) exhibits a conical shoulder, a neck 7/8 inches high and 3/4 inches in diameter and right angle lip 1-1/8 inches across (Fig. 48e). The second bottle base measures 1-3/4 inches in diameter; the push-up (3/8 inches deep) was formed during empontilling; the blow-pipe was used as pontil.

Both vial bases (1213, 1916) measure 1-1/8 inches in diameter. On both, the push-up (1/8 inches deep) was formed with a sharply pointed

tool, and a glass-tipped pontil was used. The single associated neck sherd exhibits a rounded shoulder, a short (1/2 inch) neck 5/8 inches in diameter, and a right angle rim 7/8 inches across (Fig. 49e).

Grimm describes virtually identical bottles and vials from Fort Ligonier as "apothecary bottles" (1970:169; Plate 63, Nos. 7, 8, 9, 10, 16, 17); Noël Hume calls them "pharmaceutical bottles" (1970a, pp. 72-76).

A clear glass cylindrical bottle about 1-3/4 inches in diameter is represented by a base fragment (1815). The push-up is about 3/8 inches deep; the blow-pipe was used as a pontil. A neck (336-4-13) may or may not belong to this vessel. The neck is short (1/2 inch) with right angle rim and a conical shoulder.

Last, there is a rounded shoulder sherd (1606) from a small, clear cylindrical vial about 1 inch in diameter.

Small Square-Based Bottles

Eight small square-based bottles measuring about 1-1/2 inches on a side are represented by 8 bases and 3 necks (Fig. 49c). All sufficiently complete bases exhibit a diagonal mold seam resulting from manufacture in a two-piece mold. Colors include green, a very pale yellow-green that is apparent only when sherds are viewed edge-on, and clear soda glass. One particularly brilliant clear base may be lead glass. The push-ups were formed in a variety of ways and are in some cases absent; empontilling was done with both the sand-tipped pontil and blow-pipe. A detailed description of each base may be found in Table 12. Three associated rim sherds exhibit short (3/4 inch) necks about 1-1/4 inches in diameter and right angle folded rims. These are probably medicine bottles, perhaps English (Brown 1971:114, 117).

TABLE 12
SMALL SQUARE BASED BOTTLE BASES

COLOR	CATALOG NO.	BASAL DIMENSIONS	Method of Forming Push-up *	Depth of Push-up	Pontil Type *
Green	1532	1-1/2 x 1-3/8	A	5/16	C
Very Pale Green.	1661	1-1/2 x 1-7/16	0	0	B
	596	1-1/2 x 1-1/2	B	1/16	C
	1204	1-1/2 x 1-1/2	B	1/8	B
	336-6-14	-	0	0	A
Lead? Glass	336-4-16	1-3/8 x 1-3/8	0	0	A
Clear Soda Glass	1482	1-1/2 x -	A	3/16	B
	715	-	-	1/16	B?

* Method of forming push-up: A - Sharp Pointed Tool

B - By Empontilling

0 - No Push-up

Pontil Type: A - Glass-Tipped

B - Sand

C - Blow-pipe as Pontil

Also included in this group are fragments of at least 5 clear "Essence of Peppermint" bottles. Four bases (240, 1483, 1305, 1331) and one neck are present; the fifth vessel is represented by a portion of a side panel (1153) that cannot belong to any of the bases. Two bases (240, 1483) are partly melted. The embossed lettering on the sides of typical "Essence of Peppermint" bottles reads, from top to bottom, "BY THE/KING'S PATENT/ESSENCE OF/PEPPERMINT". These bottles were of necessity formed in two-piece molds. Sides are about 3/4 inches wide. Only one base (1305) is well enough preserved to allow examination of the push-up and pontil scar (Fig. 49d). The bottom is flat--an unsuccessful attempt to form a push-up with a sharp pointed tool is evidenced by a small, deep, off-center conical pit; a glass-tipped pontil was used. The single associated neck (336-27-8) is 7/8" high, by 5/8 inches in diameter, with a right-angle rim 1 inch in diameter.

Small Rectangular Based Bottles

Base fragments of at least 15 small rectangular bottles with fluted corners were found. Two of these (1853, 593) are olive-green bases measuring 2-5/8 by 1-7/8 inches (Fig. 51f). They were dip-molded; a sand pontil was used. No neck sherds from these bottles are present. Noël Hume describes similar bottles as "snuff or blacking bottles" (Noël Hume, 1969c, p. 39).

The remaining bottles are made of various colors of glass--green, a very pale yellow-green, an extremely pale blue, and clear soda glass. Both dip molded and 2-piece molded examples are present. Push-ups were formed during empontilling or with a pointed tool. In several instances, this tool appears to have had a blunt working end about 1/8 inch in

diameter. Both the sand-tipped pontil and blow-pipe as pontil were used.

Associated necks are generally short, wide, with a simple right-angled lip (Fig. 48a).

By sorting according to glass color, it proved possible to assign groups of necks to groups of bases. Description of the bases and necks is presented in summary form in Table 13.

Brown feels that such bottles were used for dry commodities such as snuff or mustard (1971:119). As to place of manufacture, Grimm states with some conviction that green glass examples of this type found at Fort Ligonier "may be the only American-made glass at the fort" (1970:170), but gives no basis for this interesting conclusion.

Three rectangular bottles that lack fluted corners are also represented. One (1270) is of pale yellow glass (Munsell 7.5Y 8/4), dip-molded, and measuring 2-1/4 inches in the one preserved basal dimension. The push-up (3/16 inches deep) was found during empontilling; a sand pontil was used. The second vessel (828) is of pale brown glass (Munsell 2.5Y 8/2) and is represented only by the basal portion of a side panel. One shoulder and neck sherd (498) is from a tiny clear glass 2-piece molded rectangular bottle that would have measured no more than 1/2 x 1 inch in horizontal cross-section. The neck is 1/2 inch high; the rim is not preserved.

Turlington Bottles

Five clear glass "Turlington" bottles are represented by one nearly complete specimen (Fig. 50a) and 4 bases. Two bases exhibit shallow (1/16 inch) push-ups formed by a sharp-pointed tool; the remainder are flat, all were empontilled with a glass-tipped pontil. There is substantial

TABLE 13

SMALL RECTANGULAR BASED BOTTLES WITH FLUTED CORNERS

COLOR, MOLD TYPE	BASES		NECKS				Diameter Orifice			
	CATALOG #	BASAL DIMENSIONS	Method of Forming Push-up*	Depth of Push-up	Pontil Type*	CATALOG #		Height Neck	Diameter Neck	Rim Form*
Green, 2-piece Mold	1648	2-1/2 x 1-13/16	A	1/2	C	1874	1	-	A	-
	1679	- x 1-13/16	A	1/4	A	1569	-	-	A	-
	1560	- x 1-13/16	-	1/4	A	1514	-	1	A	1-3/4
	1416	-	-	5/8	C					13/16
Very Pale Green, Dip Mold	543	2-5/8 x 1-11/16	A	1/4	C	544	5/8	1-1/4	A	1-3/4
	336-10-7	- x 1-3/4	A	1/2	C	1481	13/16	-	A	-
Very Pale Blue Dip Mold	547	- x 1-5/8	A	1/8	C	1484	-	-	-	-
	1912	2-1/2 x 1-13/16	B	3/8	B	1913	13/16	1-1/8	A	1-5/8
	1482	2-1/2 x 1-13/16	B	5/16	B	1913	3/4	1-3/16	A	1-11/16
	1912	- x 1-13/16	B	1/4	B	1484	3/4	1-1/8	A	1-3/4
Clear Soda Glass, 2-piece Mold	1482	- x 1-3/4	B	1/4	B	1206	5/8	1-1/8	A	1-5/8
	1570	- x 1-7/8	A	7/16	B	1692	11/16	1-1/8	A	1-1/2
	941	-	-	5/16	B	1913	5/8	1-1/4	B	1-3/4

*Method of forming push-up: A - Sharp Pointed Tool
B - Blunt Pointed Tool

Pontil Type: A - Glass-Tipped
B - Sand

C - Blow-pipe as Pontil
Rim Form: A - Right Angle
B - Folded Right Angle

variation in the size of these bottles, the size of the embossed lettering, and the clarity of the lettering (Wedel & Griffenhagen, 1954, pp. 409-415; Griffenhagen & Young, 1959, pp.).

TABLE 14

TURLINGTON BOTTLES

CAT. #	BASAL DIMENSIONS	TOTAL HT	CAT #	HT. NECK	DIA. NECK	RIM* FORM	DIA. RIM	DIA. ORIFICE
1840	1-1/16 x 3/4	2-3/8	-	1/2	5/8	B	7/8	5/16
1971	7/8 x 11/16	-	542	5/8	5/8	A	7/8	3/8
542	1 x 3/4	-	1922	-	5/8	A	15/16	1/2
1415	7/8 x 3/4	-	-	-	-	-	-	-
1452	1 x -	-	-	-	-	-	-	-

* Rim Form: A - Right Angle

B - Folded Right Angle

The following glass storage container fragments recovered from the Kitchen structure were not available for study.

One lime green cylindrical bottle (Fig. 51h) with a low push-up and a large pontil scar. The vessel measures 3-1/4 inches in diameter at the base and 4 inches high to the shoulder.

One pale green square-based bottle (Fig. 50b) with a base 2-1/2 inches square. The neck is 1-3/8 inches high and 1-1/16 inches in diameter. This is probably a third French liquor bottle.

The glass storage container sample from the kitchen structure at Grand Portage was compared to the published description of the glass recovered at Fort Michilimackinac (Brown 1971). Two observations apparently reflect the temporally differing occupations at the two sites. "Essence of Peppermint" bottles with embossed lettering are absent at Fort Michilimackinac suggesting that they were not produced until after 1780. Second, Brown notes that the square based blue-green French liquor bottles "appear to have been present throughout the duration of the Fort although decreasing in frequency during the last decade (1971:110). Bottles of this type comprise about 23% (64 out of 279) of the total glass storage containers recovered at Fort Michilimackinac, while at Grand Portage they represent only about 4% (3 out of 72). This disparity could also be a function of the primarily British occupation at Grand Portage. The British population at Fort Michilimackinac increased dramatically after the French capitulation in 1760 so that a proportional decrease in French material remains after that date could be a function of an increase in British goods. The decreasing frequency of French liquor bottles after 1770 at Michilimackinac and their scarcity at Grand Portage could be the result of a shift from French to a British source of supply.

The use to which the large, square-based lead glass bottles found at Grand Portage were put deserves consideration. As has been noted, these may be either storage bottles or decanters. Assuming them to be decanters, the ratio of decanters to drinking vessels at the site is about 1:4.6 (14:63), while at Fort Michilimackinac the ratio is about 1:29 (8:235). The latter ratio seems more likely suggesting that either the sample at Grand Portage is peculiarly skewed in favor of decanters, or more reasonably, that these bottles served as storage containers.

Clear Lead Glass Tumblers

Portions of approximately 60 clear lead glass tumblers were recovered from the Kitchen and its periphery. Readily discernable were four varieties within this sample. These were: plain, fluted, ribbed and engraved. All of these tumblers are non-footed and have massive bases. Their slightly conical sides gradually expand outward from the bases. The more simple tumblers have roughly broken off pontil scars on their bases. Most common of all are the plain variety which are now described.

Plain Tumblers

There are about 50 plain tumblers from this site. Complete or measurable bases are present for 40 specimens, and other basal fragments indicate that at least 50 tumblers are present. Thirty of these bases have diameters which are from 1-5/16" to 1-3/4". Eight bases are from 1-7/8" to 2-1/4", and three bases are 2-1/2" in diameter.

All of these vessels have massive bases which have roughly broken off pontil scars on their bottoms. The bases are from 4/16" to 9/16" thick, with most of them being 5/16" to 6/16" thick. These glasses appear to taper outwards gradually from their bases. It is impossible to estimate their heights from the extant remains, but they can be compared with more complete examples. A tumbler from nearby Fort Charlotte, for instance, has a base diameter of 2-5/16", a rim diameter of 3-1/4", and a height of 4". An illustrated small tumbler is about 1-1/2" in diameter at its base and nearly 4" high; a larger tumbler is about 3" in base diameter and 6-1/4" high. Examples from the comparable post of Michilimackinac

are present in small, medium, and large sizes. These have the following dimensions: small - base diameter 1-3/4", height 2-3/4", rim diameter 2-1/4", capacity ca. 3 ounces; medium - base diameter 1-3/4", height 3", rim diameter 2-1/2", capacity ca. 4-1/2 ounces; large - base diameter 2-3/4", height 4-1/2", rim diameter 3-3/4", capacity ca. 7-1/2 ounces (Noel Hume, 1969c, p.24, Fig. 14, & Brown, 1971, p. 204). In all probability, the tumblers from the Kitchen structure at Grand Portage are almost identical in their dimensions. A tabulation of the basal dimensions of forty tumblers is given below:

TABLE 15

BASE DIAMETERS OF CLEAR LEAD GLASS TUMBLERS

<u>Basal Diameter</u>	<u>Numbers</u>	<u>Basal Diameter</u>	<u>Numbers</u>
1-5/16"	3	1-15/16"	0
1-6/16"	1	2	3
1-7/16"	3	2-2/16"	2
1-8/16"	13	2-3/16"	0
1-9/16"	5	2-4/16"	2
1-10/16"	1	2-5/16"	0
1-11/16"	2	2-6/16"	0
1-12/16"	2	2-7/16"	0
1-13/16"	0	2-8/16"	3
1-14/16"	1		<u>0</u>
			40

A total of 76 wall and rim fragments were recovered. They average 1/16" thick. The rims are rounded and somewhat thickened and have been fire polished or smoothed.

Fluted Tumblers

Also recovered from the site were portions of 6 large tumblers with vertical flutes on their sides. All of them had bases about 2-1/2" in diameter. In all instances, the pontil scars had been ground away from the bases. Their bases are from 5/16" to 1/2" thick. The walls are about 3/16" thick at the bases. As they become higher, they are progressively thinner. At 1-1/4" above the base, the walls are 1/8" thick. A few rim fragments are 1/16" thick. The rims are rounded, often with a small lip, and are fire polished. These tumblers, like the others in the collection, have walls which taper outwards from the bases. When complete, they were about 4" in height and had rims which were about 3-1/2" in diameter.

Each tumbler had approximately 25 vertical flutes which ran from near the bases up almost to the rims. These flutes are 1/4" wide and were ground into the tapered tumblers with a grinding wheel. A few rim fragments have survived. They bear the terminal ends of the flutes which taper to a pointed arch about 3/4" below the rim.

Engraved Tumblers

Portions of 3 or 4 tumblers which were decorated by wheel engraving are represented by 8 fragments from the Kitchen or its immediate area. Three fragments have portions of engraved letters on them. Two of these segments fit together and appear to form the word "JOHN." Associated with them may be two other fragments which bear fragmentary depictions of the familiar Masonic square and compass. Another fragment with lettering apparently represents still another tumbler. Two other engraved tumblers are represented by fragments which have portions of foliage-like designs.

These may be remnants of the Scottish thistles which were so often engraved on glasses in the last half of the eighteenth century (Noël Hume, 1970a, p.194).

Moulded Tumblers

Three tumbler fragments are obviously moulded. They have raised "ribbed" elements which are 5/16" in width and which run horizontally around the circumference of a tumbler. Like the other wall fragments, these are 1/16" thick. One rim is thickened and smoothed by fire-polishing. Complete glasses of this type have been recovered at Michilimackinac and are illustrated in a study of glassware from that site. Brown raises the possibility that glasses of this type were made at Norwich or Lynn, England ca. 1770 (Brown, 1971, p. 166, Fig. 12 and pp. 121-122).

Stemmed Ware

The bases and stems of two stemmed pieces are present. The most complete example has a base 2-1/2" in diameter and 5/32" thick. Its stem is 1/2" in diameter, plain and 2" long. Its pontil scar is fire-polished and smooth.

The second piece is more incomplete. Its base is 2-1/4" in diameter and 3/16" thick. Only the stub of a stem is present; it is 3/4" in diameter. The pontil scar is also fire-polished and smooth.

Possibly associated with one of the stemmed pieces is a drinking vessel rim fragment which was moulded in a full-sized mould or blown into a full-sized mould. It has a diamond-shaped decorative pattern.

Conclusions and Speculations on the Drinking Vessels--Kitchen Structure

In my opinion, it is a self-evident fact that these vessels were used for drinking. If the written records dealing with liquors and wines

and the physical evidence of the bottles from the site are to be believed, the North West Company personnel at Grand Portage drank copiously and were careless with their drinking glasses. These obvious conclusions are dealt with in a more empirical manner hereafter.

A sample of 63 glasses are represented (61 tumblers, 2 stemmed vessels). Of this number, 50 were plain glass tumblers. They were present in what appear to be three standard sizes which are simplistically called small, medium and large. Most common were the small tumblers of which 30 examples were recovered. They comprise almost one-half of the sample, and presumably represented a large proportion of the glassware at hand.

Smallness in liquor glasses at least implies the use of concentrated or distilled liquors in them. This may indicate that brandy, gin, rum, and other distilled liquors were commonly consumed here. The medium-sized tumblers could have been used for watered drinks or for the many mixed drinks such as punches, flips, etc. which were popular in the eighteenth century. Perhaps the large tumblers were used for similar beverages, but fewer of them were recovered. Wines were commonly drunk in stemmed glasses. The two stemmed pieces found hint that wines were rarely drunk or that such glasses were seldom broken.

Less common were the 6 fluted tumblers, 4 engraved tumblers, and 1 ribbed tumbler. These more elaborate and expensive vessels were all of the large size. They comprise 16% of the drinking vessel sample. It appears logical to conclude that they were used only by the wealthier personnel or visitors to the site. Wines and stemmed ware were perhaps used largely by the same individuals.

TABLE 16

TABULATION OF THE DRINKING VESSELS FROM THE KITCHEN STRUCTURE

	<u>Plain Tumblers</u>	<u>Decorated Tumblers</u>	<u>Percent of Sample</u>
Small	30	0	49
Medium	8	0	13
Large	6	11	28
Indeterminate	<u>6</u>	<u>0</u>	<u>10</u>
Total	50	11	100

This comparison clearly shows that the small plain tumblers were the most commonly used glass drinking vessel at the site, and that large tumblers were the next most commonly used. In the large tumbler classification, the decorated vessels outnumber the plain ones by a margin of almost 2 to 1. Plain tumblers at Grand Portage comprise 82% of the sample of 61 tumblers; decorated large tumblers are 18% of this sample.

Also of comparative interest are the proportions of tumblers to stemmed ware at Grand Portage and Michilimackinac which are given below (Brown, 1971, p. 143).

TABLE 17

PROPORTIONS OF TUMBLERS TO STEMMED WARE

	<u>Tumblers</u>	<u>Stemmed Ware</u>	<u>Total Sample</u>	<u>Tumbler %</u>	<u>Stemmed %</u>
Grand Portage	61	2	63	97%	3%
Michilimackinac	90	145	233	38%	62%

It is apparent that tumblers were far more commonly used at Grand Portage. Perhaps this is another reflection of the costs of transportation and breakage enroute to the frontier outpost of Grand Portage. It may also reflect the almost exclusively masculine atmosphere at Grand Portage and the lack of established European-type households and an observance

of the amenities of cultured life. Some luxury, however, was not lacking at Grand Portage as evidenced by the decorated tumblers and stemmed glasses.

NATIVE ARTIFACTS
(Figure 52)

Wooden Net Shuttle (1) (No. 536). This is the first example of its kind which has been archaeologically recovered at Grand Portage. It is incomplete and has a "V" shape. The upper surface is rounded and slightly higher in the center than at the edges. The under surface has a semi-circular concavity which runs from the tip to the rearmost point. The concavity is somewhat conical in form as it is more constricted at the front and wider at the rear. At the rearmost point, it is 5/8" wide and 9/16" in depth. It is 1-3/4" long. Overall shuttle dimensions are 1-3/4" in width and 5" in length (Figure 52A).

When complete, the shuttle would have been about 10" in length, and would have had a closed rear end. A rounded wooden point would have projected about 6" through the center of the shuttle. Its function would have been to carry twine as a net was being woven. A shuttle of this form is illustrated for the Chippewa Indians (Densmore, 1929, Plate 59b). The presence of this object in the Kitchen is strong evidence that a local Chippewa (perhaps a woman) made or repaired fishing nets in the building. Presumably, they were used for fishing in the nearby Grand Portage bay. Seemingly, this is another example of the cultural interchange which went on between Indians and white men continually on the North American frontiers.

Stone Pipes (3) (Nos. 264, 800, 1203). All of them are in a fragmentary condition. Enough of each is present to identify it as a pipe bowl fragment, and to allow a few generalizations concerning its form, but there is not much point in describing them at length. All of these pipes are of native Indian, and probably Chippewa origin. They are of the familiar "Micmac" type which is found from the Atlantic seaboard westward along the Great Lakes. Many of them have been illustrated by artists such as Peter Rindisbacher in the general region from the 1820s onwards.

The Micmac pipe has a rounded bowl which is placed over a constricted circular area that rests upon a small rectangular base. All of these pipes are of the type used for personal smoking. One of them is made from a dark schistose or serpentine; another is made of a recrystallized sandstone; the third is made from a reddish limonite or an iron oxide compound. The single more complete specimen, (No. 264), had a bowl about $1\frac{1}{2}$ " in height; $1\frac{1}{8}$ " in diameter at its widest point; rested on a rounded constriction which was about $\frac{1}{2}$ " in diameter. The bowl cavity was $\frac{9}{16}$ " in diameter and 1" in height (Figures 52, B, C, & D).

Stone Flakes (5) (Nos. 465, 1262, 1498, 1623, & 336-21-10).

Each season's excavations at Grand Portage has turned up a few scattered pieces of chipped stone. The 1970-71 excavations produced five miscellaneous stone flakes which appear to have been formed during the making of a flaked stone artifact. Only one of them, No. 1498, might be an artifact. It bears a resemblance to a small scraper and is $\frac{3}{4}$ " in width, and $1\frac{1}{4}$ " high. All of these flakes bear what seem to be conchoidal fractures which are commonly produced during the detaching

of a flake from a larger stone. The materials represented are a dark flint, a dark honey colored flint, a banded agate, and two pieces of dark jasper. It is doubtful that any of these items relate directly to the fur trade era at Grand Portage as the white man's metal tools were present in large numbers and superior in performance.

Bone Tube (No. 387).

A bone tube of the type used by native doctors in curing rituals was found near the Well. It was in two pieces and measured $3/8$ " in diameter by $1-1/2$ " in length.

Figure 48

HOUSEHOLD GOODS: Glass Bottle Necks and Rims

- Item A, No. 544. A clear glass bottle neck and rim.
- Item B, No. 768. A clear glass bottle neck with a flaring rim.
- Item C, No. 1446. A clear glass bottle neck with an applique rim.
- Item D, No. 592. A green glass bottle neck with an applique lip applied below an upper lip.
- Item E, No. 723. A light green glass bottle neck with a flaring reinforced rim.
- Item F, No. 1513. A clear glass bottle neck and rim.
- Item G, No. 839. A light green glass bottle neck with an applique rim.
- Item H, No. 1453. A green glass bottle neck with an applique rim.

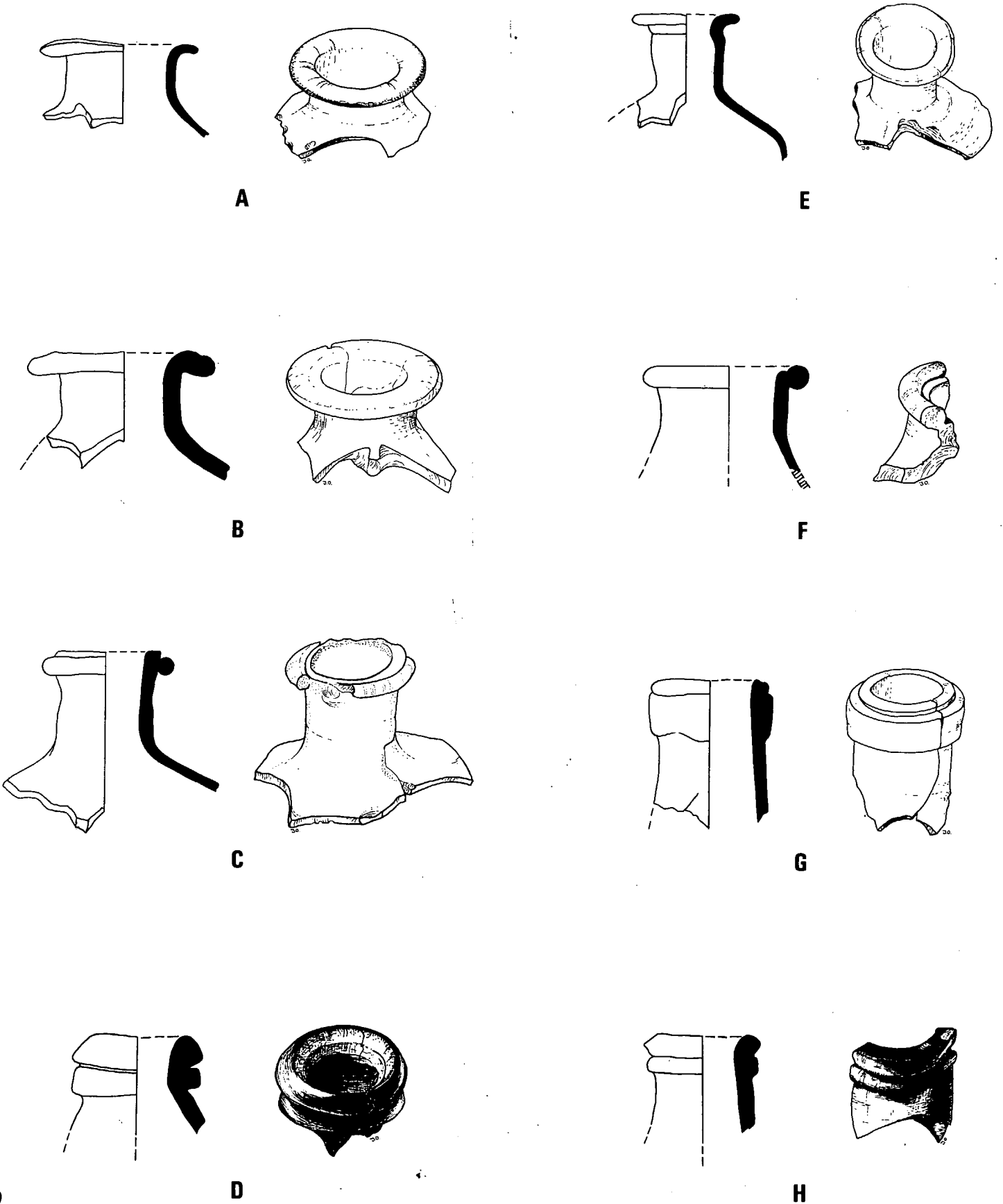


Figure 48

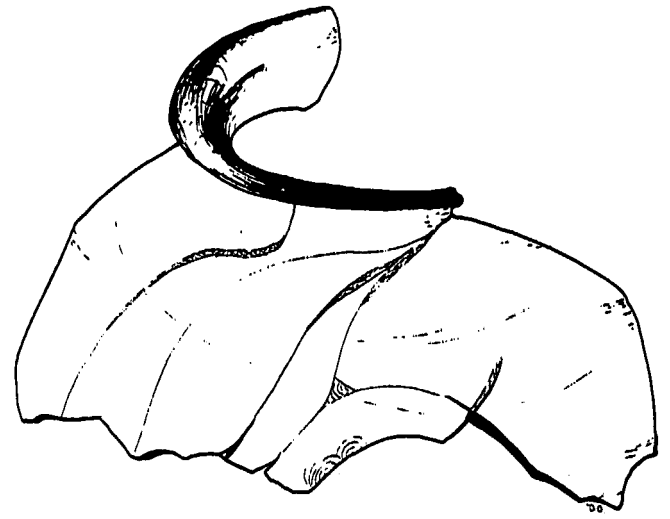
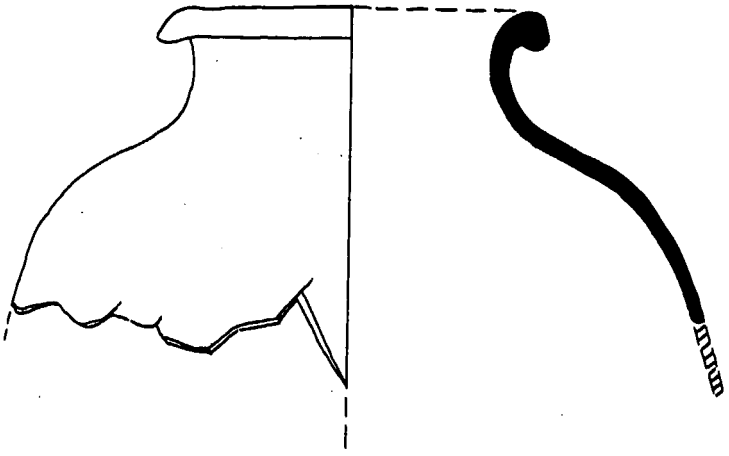




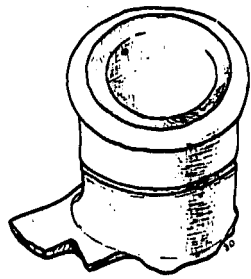
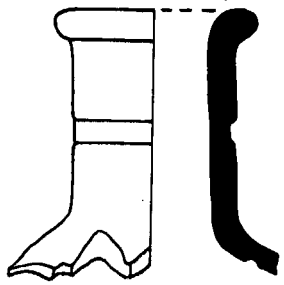
Figure 49

HOUSEHOLD GOODS: Miscellaneous Bottle Components and a Ceramic Bottle

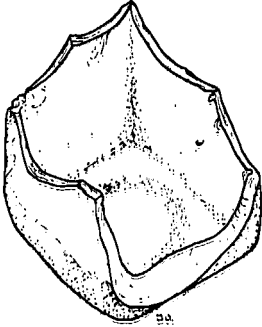
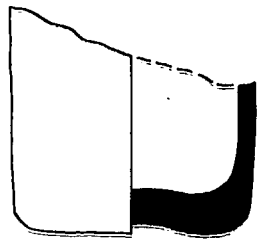
- Item A, No. 1333. Portion of the rim and shoulder of a globular green bottle.
- Item B, No. 1170. Clear glass moulded bottle neck and rim. Probably modern.
- Item C, No. 1205. Small square clear glass bottle base with pontil mark.
- Item D, No. 1305. Small square clear glass bottle base. It is from an "ESSENCE OF PEPPERMINT" bottle.
- Item E, No. 1916. Small restored light green glass pharmaceutical bottle.
- Item F, No. 1371. Small restored ceramic vial with a partial brown glaze.



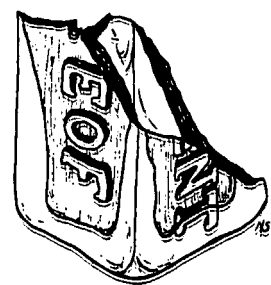
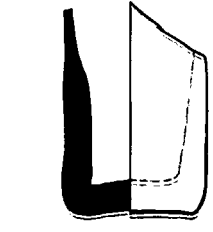
A



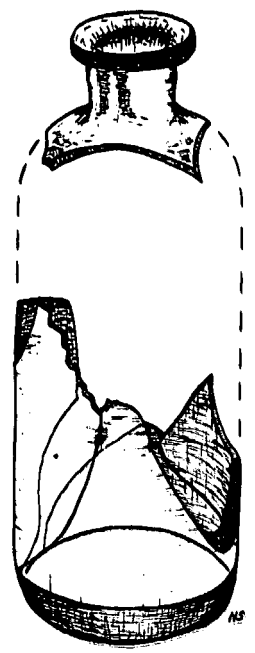
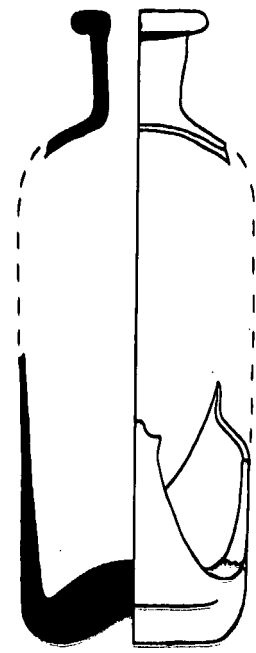
B



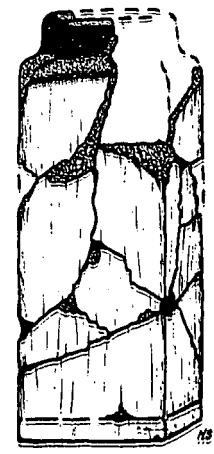
C



D



E



F

Figure 49



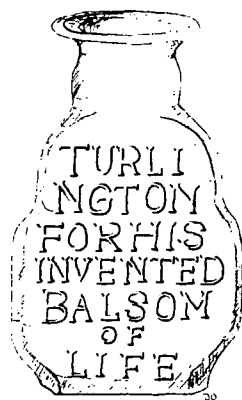
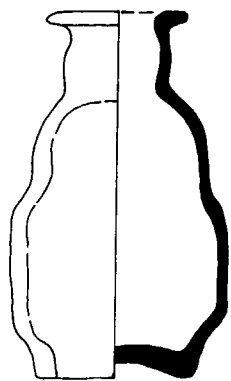


Figure 50

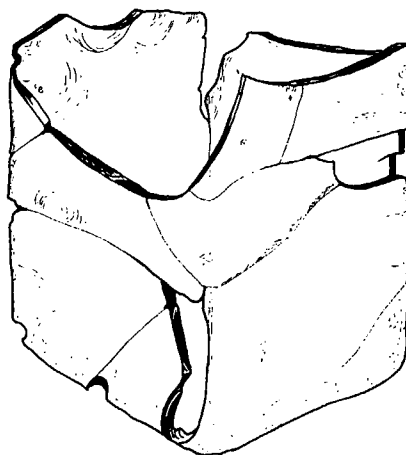
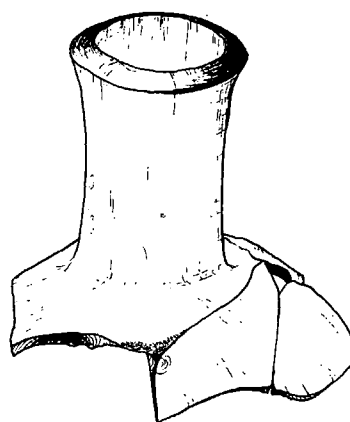
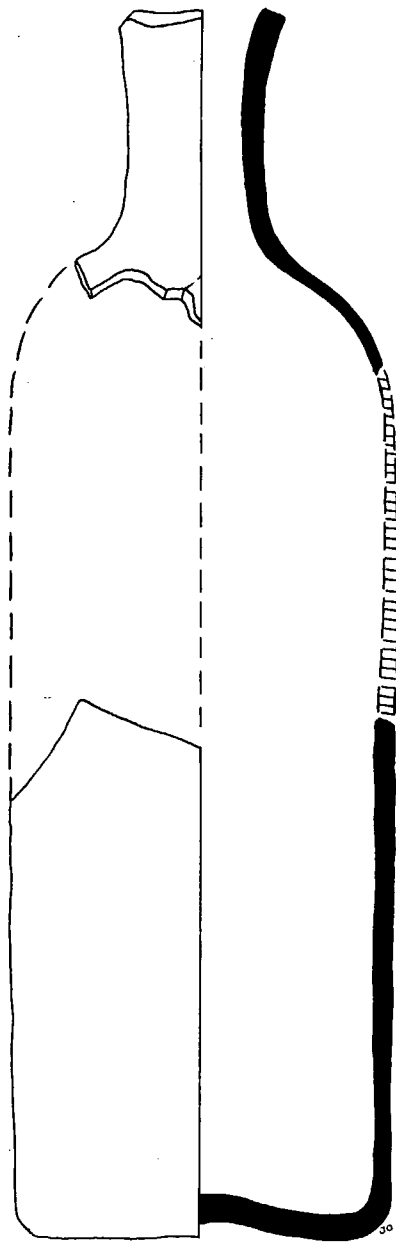
HOUSEHOLD GOODS: Turlington's Balsam of Life Bottle and a Case Bottle.

Item A, No. 1840. Three views of a Turlington Balsam of Life bottle.

Item B, No. 1600. Artist's reconstruction of a lime green square case bottle.



A



B

Figure 50



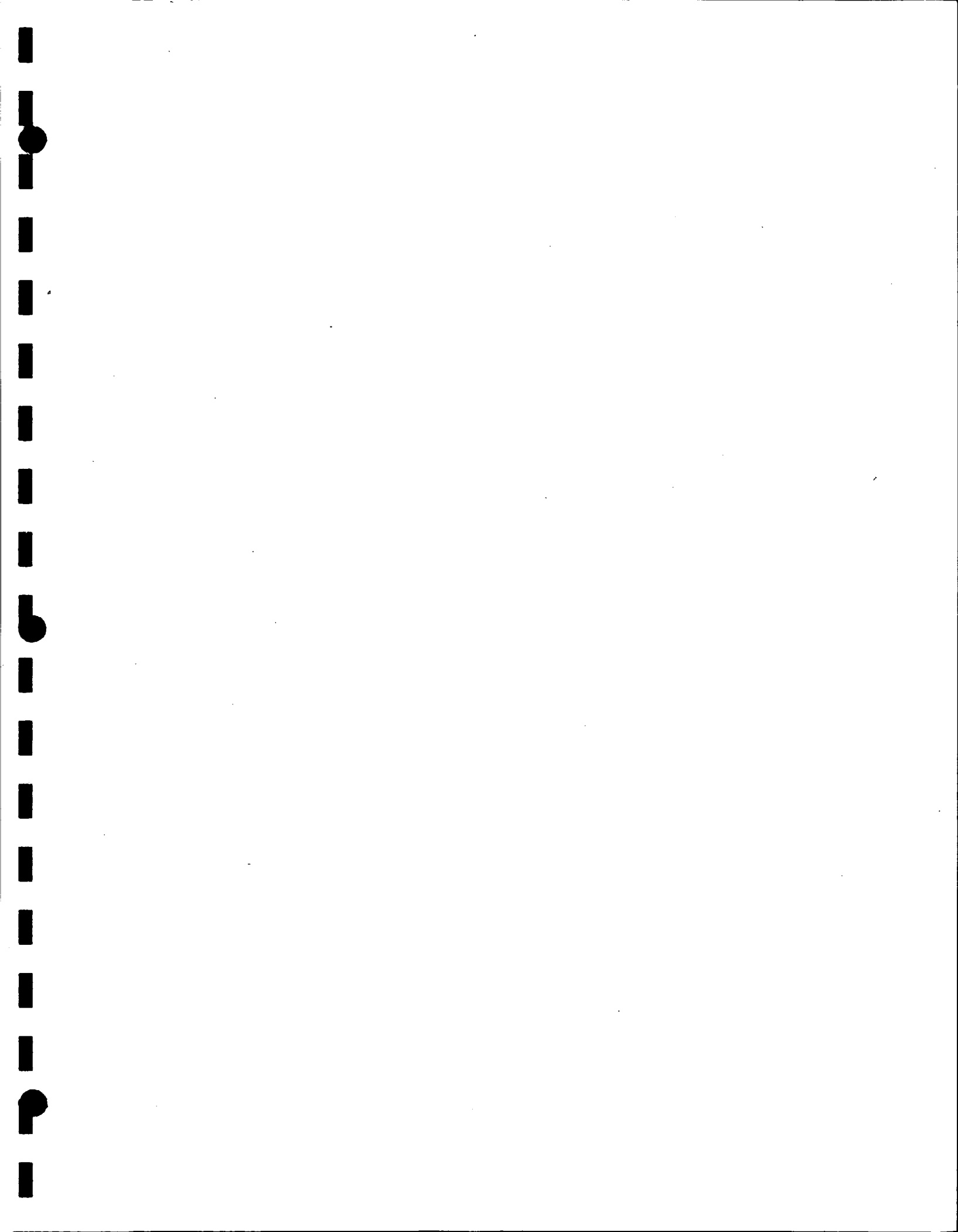


Figure 51

HOUSEHOLD GOODS: Liquor Bottle Bases and Clear Glass Tumbler Bases.

- Item A, No. 1598. Base of a large green glass liquor bottle with a low kickup.
- Item B, No. 1024. Base of a large green glass liquor bottle with a low kickup.
- Item C, No. 779. Base of a large clear glass tumbler with fluted panels.
- Item D, No. 1806. Base of a medium sized clear glass tumbler or shot glass.
- Item E, No. 1805. Base of a small clear glass tumbler or shot glass.
- Item F, No. 1843. Two views of a dark green rectangular bottle with fluted corners and a basal mark.
- Item G, No. 1662. Base of a large green glass bottle with a medium kickup.
- Item H, No. 1872. Base of a lime green glass bottle with a low kickup and a large pontil scar.
- Item I, No. 1544. Base of a light green glass bottle with a nipple-like kickup.
- Item J, No. 1558. Base of a medium sized dark green glass bottle with a medium kickup.

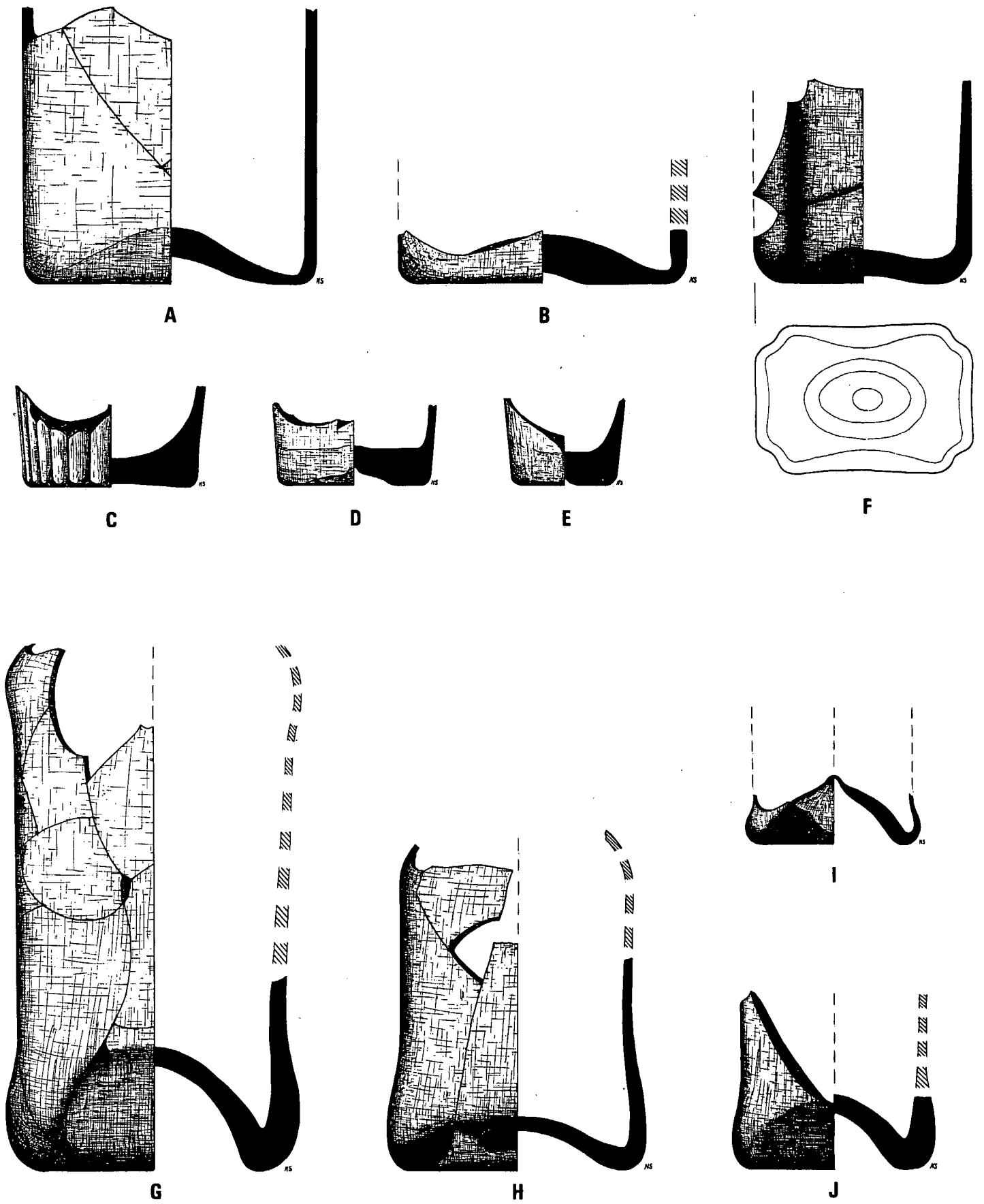


Figure 51.





Figure 52

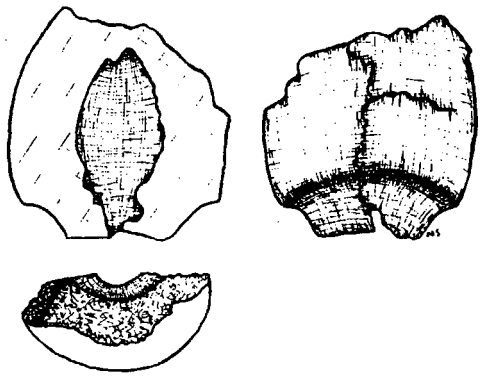
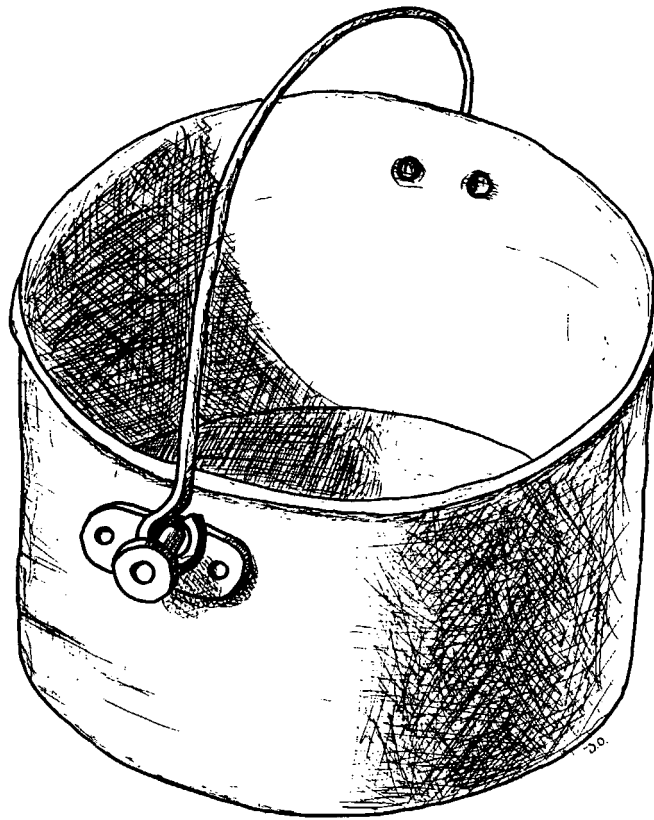
HOUSEHOLD GOODS: Brass Kettle

Item A, No. 535. An artist's conception of a brass kettle found in a fragmentary condition within the Kitchen building. This vessel was cylindrical with cast brass lugs. Originally, it was about 10" in diameter and 8" in height. Enough was found to make this accurate drawing.

NATIVE ARTIFACTS: Wooden Net Shuttle and Broken Stone Pipes

Item A, No. 536. A unique wooden net shuttle. It is 1-5/8" wide by 5" long and, of course, is incomplete. Most probably, it is of native manufacture.

Item B, Nos. 264, 800 and 1203. Line drawings of three fragmentary stone pipes of the "Micmac" type. One is made from a dark schistose or serpentine. Another is formed from what appears to be a recrystallized sandstone. The last pipe is made from a reddish Limonite, an iron oxide compound. All of these specimens would appear to be of native origin.

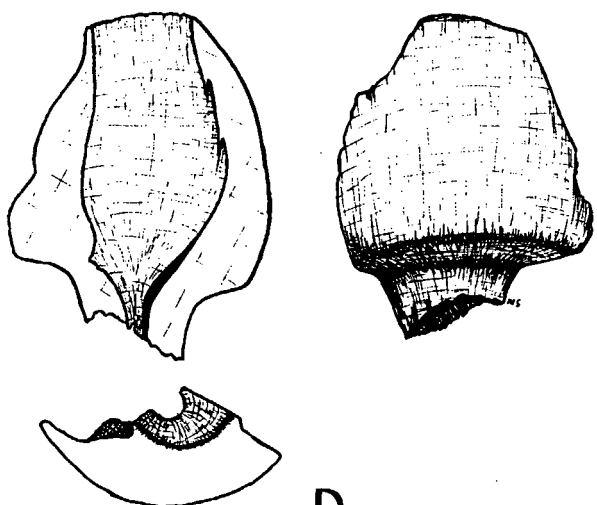


A

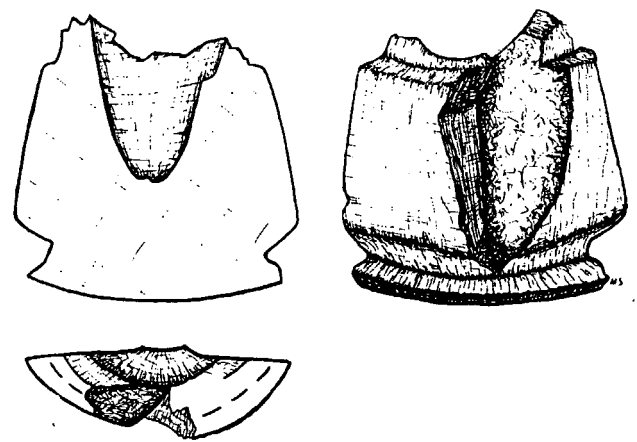


C

B

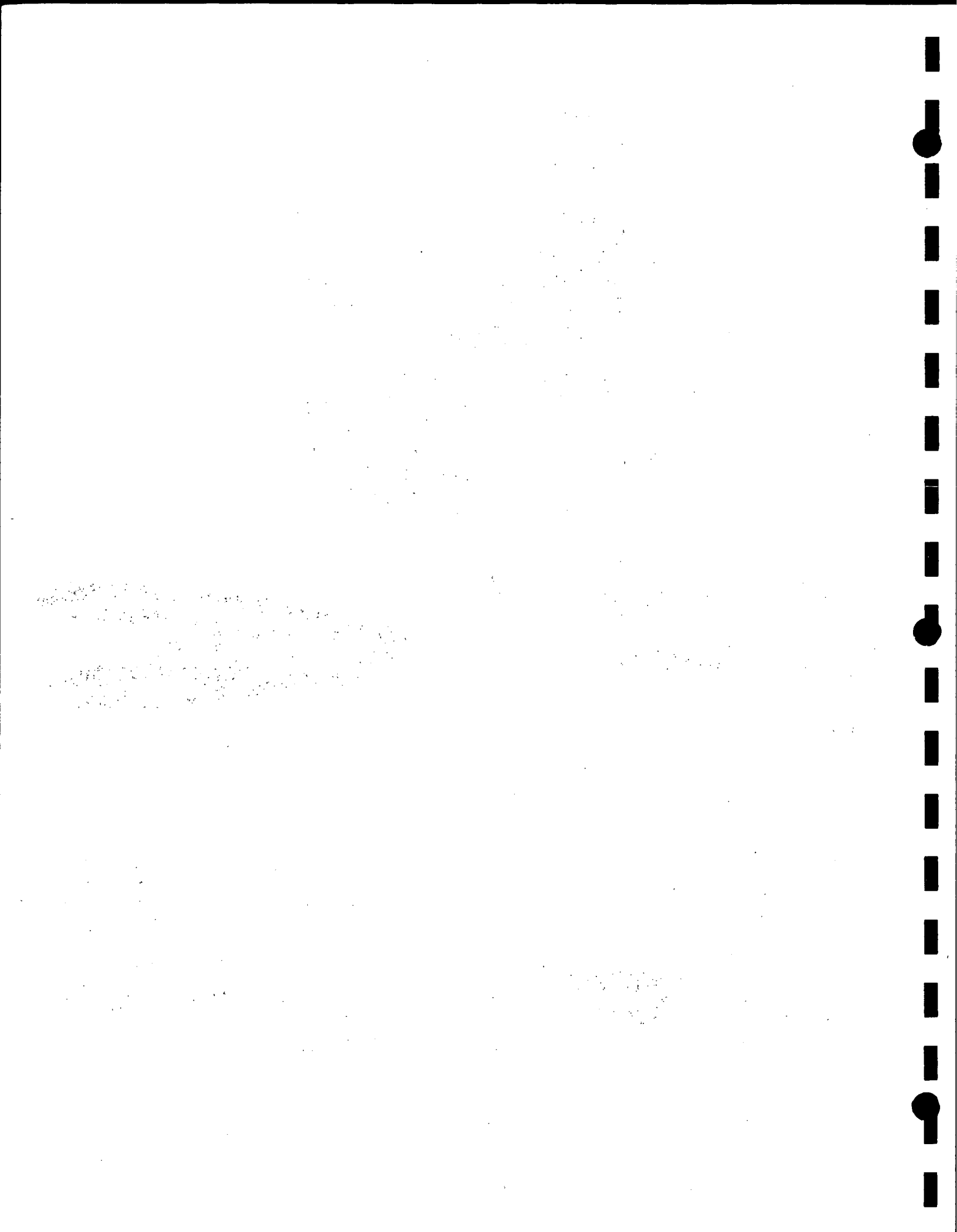


D



E

Figure 52



ARTIFACT DISTRIBUTION STUDIES

During the excavation of the Kitchen, it was obvious that some locations yielded more artifacts than others. Especially productive were the Fireplace and the Cooler. The Fireplace, for instance, contained approximately 1,500 artifacts or 12% of the artifacts recovered from the Kitchen and its perimeter. Logically, one could assume that a fireplace would be an important location in any building in these latitudes, but in a Kitchen, it had an even greater significance. At the very least, it provided heat for cooking and comfort, light for dark days or evenings, and a social center around which people could gather during leisure moments or in the evenings. It also served to burn trash swept up from the floor. Presumably, a listing of the many types of artifacts found within this feature can provide some additional clues to its usage during the close of the North West Company's occupation of the site. Found in the Fireplace were:

Many evidences of liquor consumption--this being demonstrated by 61 glass tumbler fragments, square based clear lead glass bottles, 50 clear glass bottle fragments, 33 green glass bottle fragments, and square and round green glass bottle bases. Some of the tumbler fragments were fluted or engraved. All of these objects can be associated with the storage and consumption of liquor. Perhaps it is not amiss to speculate that the kitchen staff or other employees were in the habit of consuming liquor in this building; at times in front of a cheery fire. Broken or discarded bottles and tumblers were then disposed of by throwing them into the nearest convenient place--the Fireplace.

Not surprisingly, a number of cutlery items were likewise found here. Amongst the white wood ashes were 4 spoons, 3 forks, and 1 table

knife. Utensils were represented by an iron spoon handle, a brass candle snuffer, and a number of brass kettle fragments. Also recovered here were 3 iron rods which could have been kettle handles or ladle handles.

Ceramics were represented by 241 fragments of pearlware and 248 fragments of creamware. Undoubtedly, some of these dishes were used for serving purposes within the building. Others may have been broken here or discarded into the fireplace as not worth moving at the time that the removal to Fort William took place in 1802. Twenty-eight bone fragments and 6 pieces of wood were also recovered from within the fireplace.

Tools comprised 5 specimens. Amongst them were a gimlet, a keyhole saw blade, a knife blade, a jackknife blade, and a miscellaneous piece of steel. Closely associated with them were 466 rosehead nails and 151 fragmentary rosehead nails. This was a large portion of the nails recovered from the building; some 25% of the total sample of 2,868 nails or nail fragments found here. Many of the nails were clinched and provide proof that the wooden tables, benches, or door casings which they once fastened were in all probability used to cook a few final meals in the fireplace.

Personal possessions consisted of 2 conical brass tinklers, 9 beads, 31 clay pipe stems and 9 bowl fragments. Also recovered here 3 burned gun flints, 1 lead shot, 1 lead ball and 2 lead droplets.

Collectively, the artifacts found in this location reveal that the staff who worked within the building had some creature comforts such as good cutlery and tableware. Tobacco appears to have been a popular mode of relaxation as attested by the clay pipe fragments. The numerous drinking tumbler and liquor bottle fragments likewise show that quantities of liquors were consumed here. The burned gun flints, lead shot, lead ball,

and lead droplets indicate that a hunter once prepared for hunting wild game in front of the fireplace by casting his lead balls and installing new gun flints in his weapon. The personal possessions such as the beads and brass tinklers hint strongly that one or more Indian women worked and perhaps lived in this building with the kitchen staff.

A less elaborate inventory was found within the Cooler, but it also tells us something of the life styles during the closing days of the North Westers at this site. Presumably, this feature was used to cool and preserve foods and beverages in the absence of better refrigeration. The artifacts found here show that it was used as a trash repository at the time the building was abandoned.

This inventory includes the following materials: 29 bone fragments, many wood fragments, 67 pearlware and 108 fragments of creamware, as well as 5 fragments of earthenware correlate with the materials found in the fireplace. Portions of two pewter spoons, a brass teakettle spout, scrap brass, and a knife blade had a clear association with this building's use.

Also found within the Cooler were 8 tumbler fragments and a clear lead glass goblet base. There were portions of 3 clear square based lead glass bottles, and portions of two other lead glass bottles. Many fragments of dark green bottle glass, pieces of Essence of Peppermint, Turlington's Balsam of Life, and a small green medicine vial were likewise found here.

Personal items were scarce and largely confined to clay pipe fragments and a number of beads. One gun flint was also found here. Building materials such as 8 window glass fragments, 2 pieces of building hardware, 139 rosehead nails and 70 fragmentary rosehead nails demonstrate that this spot was used for trash disposal during the last days of the the building's occupation. Additionally, many wood samples were found here.

Artifact Correlations

For the sake of convenience, the artifacts found within the Kitchen have been grouped into three generalized categories which are thought to encompass most of the activities which occurred within the building. These are: Food Preparation and Consumption; Leisure Activities and Personal Needs; and Building Maintenance and Demolition. The assumption is advanced that selected artifact groupings will reflect behavioral patterns or economic activities. Further, the concept is advanced that there is a logical and demonstrable correlation between artifact locations and the functional work or leisure areas within the structure. Two obvious functional areas are the Fireplace and the Cooler; their artifact yields have already been discussed.

These correlations were determined by plotting the numbers of specific types of artifacts found within each of 42 squares which measured 10' x 10'; this grid of course depicts the building in a schematic manner. Thereafter, the numbers were reduced to percentages of the artifact class which came from each square. An arbitrary decision was made to deal with only those percentages which were on the order of 5 percent or higher.

Food Preparation and Consumption was defined to include animal bone; kettle brass, cutlery, tea kettle spouts, and utensil handles; and ceramics--pearlware, creamware, and porcelain. By any standards, these artifacts can be logically associated with food preparation and its consumption.

Animal Bone (860 Specimens), (page 292). Twenty-two percent was found in Square 10W-30N; 12 percent in 10W-20N; 5.5 percent

in 20W-20N; and 5 percent in 20W-30N. Thus, 44 percent of all of the animal bone was recovered in four squares outside the Kitchen's front door and in or adjacent to the Drain Trench. An additional amount of animal bone was found in these areas: 8 percent in 10E-40N; 5 percent in 0-E/W-50N (Fireplace); and 5 percent in 10E-70N. Square 10E-40N is thought to have been a part of a food preparation area, and Square 10E-70N is in an area which is thought to have been a storage shed at the rear of the building. Hence, 62 percent of the bone came from 7 squares which were in 3 separate locations.

Kettle Brass, Cutlery, Tea Kettle Spouts and Utensil Handles

(106 Specimens) (page 293). Eighteen percent were found in 0-E/W-50N (Fireplace); 13 percent in 10E-40N; 8 percent in 10W-60N; 6 percent in 0-E/W-60N (Cooler); 6 percent in 10W-20N; 5 percent in 20E-40N; and 5 percent in 20W-30N. Hence, 32 percent of these artifacts were found in 3 squares which contained the Fireplace, the Cooler, and the square west of the Cooler. Two squares southeast of the Fireplace had 18 percent of the items; and two squares near the front door of the Kitchen had 11 percent. Thus, 7 squares contained 61 percent of these materials.

Ceramics: Pearlware (1076 Specimens) (page 294).

Thirty-two percent was recovered from 0E/W-40N, south of the Fireplace; 19 percent in 0E/W-50N (Fireplace); 8 percent in 0E/W-60N (Cooler); 8 percent in 10E-60N, east of the Cooler; 9 percent in 10E-50N, east of the Fireplace. Seventy-six percent of the pearlware came from 5 squares in the center of the building and adjacent to the Fireplace and Cooler.

Ceramics: Creamware (649 Specimens) (page 295). Twenty-two percent was recovered in 10E-70N, on the northern edge of the building; 14 percent in 10E-60N, east of the Cooler; 7.5 percent in OE/W-60N, the Cooler. Thus, 43.5 percent of the creamware came from 3 adjacent squares containing the Cooler, east and north of it. Twenty-two percent in 10E-40N; 8 percent in OE/W-40N; or 30 percent in 2 squares south and east of the Fireplace, and 6 percent in 20E-20N in the northeastern corner of the building.

Ceramics: Porcelain (70 Specimens) (page 296). Twenty-seven percent was found in 10W-20N; 27 percent in 10W-30N; 7 percent in 20W-30N; and 5 percent in O-E/W-30N. Sixty-six percent of the porcelain was from 4 adjacent squares located in the area of the front door and in and around the Drain Trench. Seven percent was in 30E-60N in the northeastern portion of the building. This latter location may have been an area in which cupboards stood. Five squares contained 73 percent of the porcelain.

Table Ceramics: Pearlware, Creamware and Porcelain. (1802 Specimens) (page 297) Twenty-two percent was in OE/W-40N, south of the Fireplace; 12 percent in OE/W-50N, Fireplace; 10 percent in 10E-60N, east of the Cooler; 9 percent in 10E-40N, southeast of the Fireplace; 8 percent in OE/W-60N, Cooler; 8 percent in 10E-70N, a possible shed; and 6 percent in 10E-50N, east of the Fireplace. Hence, 75 percent of the table ceramics were recovered in 7 squares around the Fireplace and Cooler.

All Ceramics: (1936 Specimens). Twenty-one percent in OE/W-40N, south of Fireplace; 11 percent in OE/W-50N, Fireplace; 9 percent in

10E-40N; 9 percent in 10E-60, east of Cooler; 8 percent in OE/W-60N, Cooler; 8 percent in 10E-70N; 6 percent 10E-50N, east of Fireplace; 6 percent 10W-40N; 5 percent 10W-30N. Therefore, 83 percent of all ceramics were found in 9 squares within the center of the building. Most of it centered around the Fireplace and the Cooler.

Building Maintenance & Demolition: Window Glass (345 Specimens)

(page 299) Ten percent in Square 20W-60N; 8 percent in 10E-70N; 6 percent in 20W-40N; 7 percent in 10W-40N; 6 percent in OE/W-40N; 6 percent in 10W-30N; and 5 percent in 10W-20N. Forty-eight percent of the window glass was found in 7 squares which were located in three different portions of the building. Much of it came from the southwestern edge of the building, but there does not appear to be a regular distribution pattern for it.

Building Maintenance & Demolition: Nails & Nail Fragments (2611

Specimens) (page 300). Eight percent in OE/W-60N, Cooler; 25 percent in OE/W-50N, Fireplace; 9 percent in OE/W-40N, south of Fireplace; 12 percent in 10W-30N and 5 percent in 10W-20N. Fifty-nine percent of these artifacts came from the Cooler, Fireplace, south of the Fireplace, and in the southwestern portion of the building and over the Drain Trench.

Building Maintenance & Demolition: Tools & Iron Bar Stock (70

Specimens) (page 301). Nine percent in 10E-70N; 6 percent in 10E-60N; 17 percent in OE/W-50N (Fireplace); 6 percent in 30E-50N; 6 percent in OE/W-40N; 7 percent in 10E-40N; 9 percent in 20E-40N; and 7 percent in 10W-30N. Sixty-seven percent of these artifacts were in 8 squares located in the center and east central portions of the building. The largest single grouping was within the Fireplace.

Building Maintenance & Demolition: All Artifacts (3035 Specimens)

(page 302). Seven percent in OE/W-60N, Cooler; 22 percent in OE/W-50N; 8 percent in OE/W-40N; 11.5 percent in 10W-30N; and 5 percent in 10W-20N. Fifty-three and 5 tenths percent of these artifacts were located in 5 squares which form a pattern running south from the Cooler and Fireplace to the right hand side of the front door of the building and in the Drain Trench.

Leisure Activities: Clear Glass Liquor Tumblers (225 Specimens)

(page 303). Eight percent in OE/W-60N, Cooler; 26 percent in OE/W-50, Fireplace; 8 percent in OE/W-40N; 10 percent in 10E-40N; and 5 percent in 10W-30N. Fifty-seven percent of the tumblers in 5 squares which extend south from the Cooler, through the Fireplace, east of the Fireplace, and to the right of the kitchen's front door and over the Drain Trench.

Leisure Activities: All Liquor Bottles (585 Specimens) (page

304). Twenty percent in 10W-60N; 6 percent in OE/W-60N, Cooler; 6 percent in 10W-50N; 8 percent in OE/W-50N, Fireplace; 9 percent in 20W-40N; 7 percent in 10W-40N; 5 percent in OE/W-40N; 5 percent in 10E-40N; and 7 percent in 10W-30N. Seventy-three percent of all liquor bottle fragments were found in 9 squares which cluster in the central portion of the kitchen. They surround the Cooler, Fireplace and are in a band which extends for 4 squares from 20W-40N to 10E-40N. The largest concentration of them is 20 percent in 10W-60N, just west of the Cooler.

Leisure Activities: Beads (2622 Specimens) (page 305)

Five percent in 20W-60N; 17 percent in 10W-60N; 8 percent in 20E-50N; 9 percent in OE/W-40N; five percent in 10E-40N; 8 percent in 20E-40N;

5 percent in 10W-30N; 5 percent in 20E-30N, and 5 percent in OE/W-20N. Sixty-seven percent of the sample is in 9 squares which do not form a very clear pattern. The largest percentage, 17 percent is in 10W-60N. The remainder is grouped in the east central and southern portions of the building.

Leisure Activities: Earthenware Snuff Jar Fragments (121 Specimens) (page 306). Forty-four percent in 20W-30N; and 36 percent in 10W-30N. Both squares are to the right of the kitchen front door and over the Drain Trench. Hence, 80 percent of the snuff jar fragments were found in these two squares.

Leisure Activities: Kaolin Pipe Fragments (878 Specimens) (page 307). Sixteen percent in 10W-30N; 9 percent in 10W-20N; 6 percent in 20W-30N; 6 percent in OE/W-20N; 6 percent in 20E-30N; and 5 percent in OE/W-30N. Fifty-seven percent of the pipe fragments were found in 7 squares; 6 of them are south and southwest of the Fireplace and near or in front of the front door to the kitchen building. The remaining square is in the southeastern corner of the building.

Leisure Activities: Personal Possessions (56 Specimens) (page 308). Sixteen percent in 20W-30N; 11 percent in 10W-30N; 11 percent in OE/W-40N; 9 percent in 10E-40N; 7 percent in OE/W-50N, Fireplace; 5 percent in OE/W-30N; and 5 percent in 10W-20N. Sixty-four percent of the personal items were found in 7 squares including the Fireplace, south and southwest of it. Again, this leads to the popular lounging area to the right of the front door of the building, over the Drain Trench. An isolated 7 percent of these materials was found in 10E-70N which is located in the north eastern portion of the building.

Leisure Activities: Personal Needs, Medicine Bottles (55 Specimens) (page 309). Sixteen percent in 10W-30N; 11 percent in 10W-20N; 9 percent in OE/W-20N; and 5 percent in 30W-30N. Hence, 41 percent of these materials were found in 4 squares in the southwest portion of the building and in front of the kitchen door. Also, in and over the drain trench. Eighteen percent of these materials were found in the Cooler and the square to the west of it. An isolated 5 percent were found in 20E-50N which is located in the eastern central portion of the structure.

Total Artifact Distribution: All Artifacts (13,145 Specimens) (page 310). Seven percent in 10W-60N; 5 percent in OE/W-60N; 12 percent in OE/W-50N; 9 percent in OE/W-40N; 8 percent in 10W-30N; and 6 percent in 10W-20N. Fifty-three percent of all artifacts with definite provenience from the kitchen building were found in a linked series of 6 squares which range from just west of the Cooler, through the Cooler and Fireplace, south of the Fireplace, one square east of the Fireplace, and in 2 squares to the right hand of the kitchen's front door. Here, they are over the Drain Trench which was a popular trash disposal site.

The evidence discussed here is inconclusive. Perhaps a future statistical attack will resolve some of the questions. It is evident, however, that a popular trash dump and lounging place was by a porch near the front or southern door of the building. Presumably, trash was thrown under the porch. Much social activity took place immediately south of the fireplace. A food preparation area appears to have been located to the east of the fireplace and the cooler. Liquor consumption and other allied activities took place near a rear door to the building and trash was thrown out of it.

V.

EVIDENCE RELATING TO SUBSISTENCE

The faunal remains found at this location show that a few domestic animals were raised here and later butchered for food. Many local species of wild game were hunted and eaten, but their contribution to the diet must have been minor. Unquestionably, the major food supplies at this depot were imported by water transportation from the settled eastern areas. These supplies were carried mostly in wooden kegs which were held together with iron hoops. Some fragmentary hoops have been recovered at the site. Many dried foods were hauled in cloth bags. No evidence of them has survived.

It is of interest, however, to consider the subsistence evidence which has survived at the site and to compare it with similar data from another fur trade depot and with information gleaned from the written record. In some instances, this approach can correct misconceptions or provide new interpretations of the traditional accounts. Lastly, it can serve as a partial basis for present day interpretive presentations at the site.

A rather small faunal sample was recovered from the Kitchen and its vicinity. Contained within it are examples of both domestic and wild species. The paucity of animal remains precludes a detailed statistical study which would reveal the real proportions in which these animals were utilized at the site. The size of this sample, however, does indicate that locally obtained meat, from either livestock or wild game, was not a dependable food source.

A brief discussion of the natural setting of the Grand Portage region is introduced here to provide a background for a better understanding of the natural resources and limitations of the area in terms of food production. There can be no question but that the climatic conditions, soils, waters and vegetation all played important roles in terms of subsistence activities at this location.

Grand Portage lies well within the Canadian biotic province which has the uneven topography of a heavily glaciated country with gravel hills and ridges, swamps and outcrops. Most of the soils are rather infertile and low in organic matter. The climate is cool with an average mean temperature of about 40 degrees Fahrenheit. Growing seasons have from 80 to 140 frost-free days. Winter snowfall is heavy and the ground may be covered with snow for 100 to 140 days per year.

The region has heavy stands of trees surrounding inland lakes and streams. The forests of this biotic province are greatly affected by the nearby large masses of water. Usually, the predominant trees are hardwoods, but often are intermixed with important sub-climax species. A dominant tree species is the sugar maple, but yellow birch, beech, elm, aspen, basswood, hemlock and white pine are also common. An important sub-climax contains black spruce, tamarack, cedar, fir, white pine, white birch and alder which flourish on wet and swampy ground.

A variety of mammals lived in this region. Prominent among them were white tailed deer, beaver, muskrat and the cottontail rabbit. Less common, but present in some numbers were elk and moose. Most of these animals were relatively easy to hunt. Many avian species lived in this province, but most of them were only summer visitors. Among these were the spruce grouse, raven and loon. Waterfowl were abundant during the warmer months but difficult to secure without firearms except during the moulting season. Fish were not a dependable source of food because of the large and deep lakes. It was a region of lake fishery rather than river fishery, and fishing in the main lakes could be called inland shore fishery. The best fishing was during the summer months though some fishing through the

ice could be done during the winter. These factors did not allow for large food surpluses, and the province could support only small groups of people who knew the local resources and who utilized them at the proper seasons (Cleland, 1966, pp. 6-10).

There were approximately 291 identifiable animal bones or teeth found within the Kitchen building or immediately adjacent to it. Of this number, 183 were of domestic animals or fowl. These represent nearly 63% of the total sample. Species present are: Bos taurus (cattle), Sus scrofa (pig), Capra hirca (goat) and Gallus gallus (chicken).

Non-domestic species are represented by 108 bones or teeth. These comprise 38.1% of the sample. These species are: Odocoileus virginianus (white tailed deer), Cervus canadensis (elk), Castor canadensis (beaver), Ondatra sp? (muskrat), Sylvilagus sp? (cottontail rabbit), Meleagris gallopavo (wild turkey), Ictalurus punctatus (caufish) and Pogonias cromis (drum fish). Also present are the remains of an unidentified bird of game hen size. Only 2.77% of all remains were unidentifiable as to species. Mammals were the most important being present as 83% of the sample. They were followed by birds for 11% and fish at 3% of the sample. This information is in a tabular form on the next page.

TABLE 18

FAUNAL REMAINS FOUND IN OR ADJACENT TO THE KITCHEN STRUCTURE

<u>Scientific Name</u>	<u>Common Name</u>	<u>Individuals Represented</u>	<u>Percent</u>
<u>Bos taurus</u>	Domestic cattle	5 or more	38.1
<u>Sus scrofa</u>	Pig	3	16.1
<u>Capra hirca</u>	Domestic goat	1	2.74
<u>Gallus gallus</u>	Domestic chicken	1	2.75
<u>Odocoileus virginianus</u>	Deer (white tailed)	4	12.71
<u>Cervus canadensis</u>	Elk	2	6.1
<u>Castor canadensis</u>	Beaver	1	3.78
<u>Sylvilagus sp?</u>	Cottontail rabbit	2	1.71
<u>Meleagris gallopavo</u>	Wild Turkey	1	3.43
Unidentified bird	Game hen?	2	4.81
<u>Ondatra sp?</u>	Muskrat	1	.69
<u>Ictalurus punctatus</u>	Catfish	1	2.4
<u>Pogonias cromis</u>	Drum fish	1	.38
			<u>95.70</u>

The wild game species listed above are generally common in the Canadian biotic province with the exception of two species. Although little archaeological excavation has been done along the northern shore of Lake Superior, there have been no examples of the cottontail rabbit reported. It is, however, common in the Carolinian-Canadian transition zone south of this lake. The presence of wild turkey at Grand Portage is something of a surprise as the northernmost occurrence of it had been at the Juntunen Site in Mackinaw County, Michigan, and that site exceeds by 200 miles its most northern historic range (Cleland, 1966, pp. 169, 259 and 273).

These faunal remains would indicate that domestic animals were kept at the site and sometimes butchered for food. This is especially true with young animals which may have represented an unneeded natural

increase. It is also probable that milk or draft cattle might have been eaten when injured or too old for work. These conclusions are substantiated by a study of the bovine teeth which were found. Approximately 74 cattle teeth were recovered. Of this number, 44 came from young animals; 19 from animals of an indeterminate age, but probably young mature animals; and 11 specimens from mature or old animals. There is also skeletal evidence which substantiates the literary records of pigs being raised here. Also present in small numbers were sheep and perhaps goats.

The written record shows that in 1787, for instance, there were 10 cattle of varying ages and descriptions at Grand Portage. Accompanying them were 7 horses and 6 sheep. In the late 1790s or 1800, there was at least one large hog here to be fattened for winter consumption. At about the same time, there were draft cattle and milk cows in residence at the North West Company's depot (Innis, 1962, p. 232 and Thompson, 1969, pp. 53 and 101).

Further literary evidence relative to diet at Grand Portage in 1793 reveals that the winterers were regaled with a feast on their arrival. This appears to have consisted of bread, pork and drink for the common voyageurs and no doubt much more for higher ranking personnel (Thompson, 1969, pp. 62-63). There is some evidence as of 1793 that one prominent building within the depot's palisade was the Mess House (Gates, 1965, p. 94).

In early August of 1793, a pending food shortage threatened Grand Portage. Personnel there were eagerly awaiting the arrival of the newly built Otter which was to bring food supplies to the locality. At that time almost 1,000 men were at hand and food stocks were sufficient for only six more days. The fare consisted of the familiar "Quart of Leyed Indian Corn

or Maize and an ounce of Greece." (Thompson, 1969, pp. 66-67 and Gates, 1965, pp. 95-96). Fortunately, the vessel arrived and the shortage ended.

In 1794, food stocks of a less spartan nature were scheduled for these people. Among them were: 20 bales (Hams? & Cheecks?), 10 kegs sugar, 8 kegs salt, 32 kegs butter, 80 kegs pork, 230 kegs grease, 40 kegs beef, 3 kegs sausages and 17 bags green peas. There were also great quantities of high wines, rum, port wine, brandy and shrub. Obviously, not all of these goods would have been consumed at Grand Portage itself. Some of them undoubtedly went into the wilderness to provide treats and variety in diet. And, of course, the liquor was a prominent trade item (Thompson, 1969, p. 74).

Data from the competing XY Company shows that they had 442 cloth bags made up presumably for corn meal (Thompson, 1969, p. 83). In the winter of 1798-99 which was unusually severe, the North West Company lost several head of cattle at Grand Portage as hay had rotted (Thompson, 1969, p. 85). Additional evidence concerning the company's provisioning from 1799 reveals that a sailing schooner carried 619 bags of hulled corn of 1365 bushels. This shows the continuing heavy reliance on hulled corn, a staple food (Thompson, 1969, p. 88). January of 1800 found William McGillivray sending instructions to have all empty bags collected at Grand Portage and sent eastward for shipping corn (Thompson, 1969, p. 91).

Cloth bags were ideal for the transport of dry commodities, but a more leak-proof type of container was required for liquids or pickled foods. Over the many seasons of excavation at this site, a considerable number of iron barrel hoops have been found in a fragmentary form. Many such fragments were recovered from the Kitchen and vicinity in 1970-71. This form of container was so vital to the fur trade that a cooper was in

residence at Grand Portage about 1800. He relied on "Staves and Hoops" which were brought in by the Otter for barrel construction and presumably repair. These containers were in use for alcohol and grease (Thompson, 1969, p. 93).

In 1800, Daniel Harmon, a new clerk in the company's employ, was busy dispensing "Dry Goods, Rum, Flour, Sugar, Butter and Meat, etc. etc." to personnel on the site. Presumably, the company operated a General Store for the convenience of its employees and perhaps made a further profit from them (Thompson, 1969, p. 96).

Care was also exercised in providing food supplies for the employees who resided at Grand Portage during the winter months. Their menu would include corn, beef, baked biscuit, salt fish, sugar, butter, flour, rum and potatoes. The potatoes would be grown at Grand Portage itself. In addition, a large hog would be fattened for winter consumption. Fresh milk would be provided by one of the cows at the depot (Thompson, 1969, p. 101).

At about the same time, those who ate in the Great Hall had a large and varied menu which included: bread, salt pork, beef, hams, fish, venison, butter, peas, Indian corn, potatoes, tea, spirits, wine and plenty of milk from the several dairy cows kept at the depot the year around (Thompson, 1969, p. 106). Not specifically listed, but unquestionably in use here were the native products of wild rice and maple sugar.

It is readily apparent that the faunal remains found in this area and discussed here were of a relatively minor significance in terms of the overall subsistence. In all probability, only the natural increase or aged cattle were consumed as fresh beef at the depot. Along with them there apparently was a casual consumption of a pig or two a season, and a few sheep or goats. Somehow, a solitary chicken was sacrificed and its remains

survived to testify that it had once lived here. Doubtless there were others of its kind which are unrecorded.

There is ample evidence to show that occasional local elk, white tailed deer, beaver, muskrat, wild turkey and grouse were hunted and consumed at this location. Their very bones testify to this conclusion. Corroborative evidence is provided by the firearms components, the gun flints and the balls and shot also found in the Kitchen structure where they had presumably been discarded or lost by the hunters.

Fish remains are scanty at this site as they consist of only single representatives of two species. Absent are evidences of the large lake trout which flourished in nearby waters. Indeed, the only piece of fishing equipment is the broken net shuttle found within the Kitchen building. It would indicate that nets were made locally and used. Also, inexplicably absent are the remains of caribou which once lived locally and the impressively large and delicious moose which are pursued today by local Indians. A once common avian species which is absent is the passenger pigeon. It, too, flourished locally during the fur trade era.

The relatively few varieties of faunal remains found here and the small numbers of them indicate that the British fur trade personnel at the site were not dependent upon domestic livestock or wild game for food. Rather, they had a dependable imported food base and could choose what they ate. A few domestic animals were raised at the site and were later butchered and eaten. A number of local species of wild game were hunted and eaten, but their contribution to the subsistence pattern was minor.

Agricultural efforts at Grand Portage did little more than provide a bit of variety in the diet. There is no evidence at hand to

indicate that the British made any effort to raise anything other than potatoes here. This is in contrast to Michilimackinac where consistent garden and farm crops were grown. Although many factors created this situation, it is evident even today that the area is not well adapted for agriculture or gardening on a dependable basis. The area's climate and soils are simply not suitable for these purposes.

These conclusions are substantiated by extensive archaeological excavations at Fort Michilimackinac. At that large site, there was a very decided decrease in the use of fish and wild game from the French era into the British occupation. Farming on a larger scale and an increased livestock production were also marks of the British at this strategic location (May, 1964, p. 7).

It is readily apparent that most of the foodstuffs used at Grand Portage were imported in perishable containers. Paramount in food storage was the wooden keg which was fastened together with iron hoops. Some fragmentary hoops have been recovered at the site. Dried foods were carried in cloth bags; no evidence of them has survived. The meats appear to have been chiefly pickled beef and salt pork which had probably been boned before being packed. Grease for use with boiled corn was also a vital component which was carried in kegs. Liquors in a large variety were also imported to this site in kegs. Perhaps many of these kegs were returned empty on sailing vessels for future re-use. Surely this was the case with the cloth bags which carried dried corn and peas for the trade in such quantities.

To date, no formal trash pits or latrines have been found at Grand Portage. In all probability they exist, and once they are found

their contents will most likely provide sufficient data to write a new and greatly amplified chapter on daily life and subsistence activities at this late eighteenth century fur trade depot.

While the excavations were underway in the Kitchen structure and around its perimeter, efforts were made to find trash pits and latrines. This search was pressed with vigor in the area north of the building, but the results were fruitless. Perhaps a more fortunate excavator will find these features at this site. At that time, it is quite possible that a much larger and better preserved faunal sample will be found. Undoubtedly, it would enlarge our understanding of the subsistence patterns at Grand Portage. In the meantime, however, we must be content with the materials discussed here.

It is possible that a minor degree of contamination crept into these faunal materials in that some more recent materials could have been mixed into the late eighteenth century deposits which were retrieved. In most instances, however, the animal bone was found in association with other materials from the fur trade era. Contamination, if it exists, is on a minor scale.

VI.

SUMMARY AND CONCLUSIONSThe Great Hall

The location of the Great Hall of the North West Company at Grand Portage was known only through vague traditions until the summer of 1937 when its site was found by excavations under the direction of Ralph D. Brown. At that time, Brown exposed the perimeter of the building and may have dug a few small trenches into its interior. From 1938 to 1940 the structure was rebuilt under the supervision of the Minnesota Historical Society. It served as an interpretive facility until July of 1969 when it was struck by lightning and burned to the ground. This afforded an opportunity to fully test the building site and its perimeter in an effort to learn more about it.

Excavations were begun here on June 15, 1970 and were pressed with vigor. By July 5th, five trenches measuring 18" in width and running the length of the building had been completed. Nothing of significance was found within the structure's foundations. Operations shifted to the front or south of the Great Hall. Here an area measuring approximately 15' by 110" was excavated. Within it were found the remains of 15 post molds which outlined a porch.

The Kitchen Structure

On July 2nd, sod was removed in an area to the rear of the Great Hall and the remains of a structure which proved to be the Kitchen building were found. This structure measured approximately 35' East-West and 27' North-South. Within it were found the foundations and portions of the chimney of a stone fireplace and a stone outlined dry

well or "Cooler." The area was excavated on the basis of a grid of 10' squares. The interior was excavated by careful troweling to ensure a high rate of artifact and structural recovery. Thousands of artifacts were found during its excavation. Little structural evidence was found. By July 23, 1970, the structure had been largely excavated. A number of questions remained to be answered however.

Excavations were resumed at the site on July 9, 1971. During this field season, the grid system was extended to the west, north and east of the building. It soon was apparent that the major portion of the building had been excavated in the 1970 field season. We were now working on its periphery in areas where porches and sheds had once stood. The existence of porches was established by regular patterns of post molds which were outlined by stones. During the two field seasons an extensive area measuring approximately 60' on a side was excavated to sterile soil or glacial boulders. All available data concerning this building had been secured by excavation.

The Central Palisade Trench

During the excavation of the Kitchen, an answer was found to a riddle which had existed for many years. This concerned the age and identity of the puzzling "Central Palisade Trench." This trench had been found in 1936-37 and ran from the main gate westward to the western palisade wall. The enclosure had been divided into three sections by lines of pickets. Had the post started out as a small enclosure and then been expanded twice to its present size or had it been reduced in scope by the time of its abandonment (Text Figure 6)? A number of points of evidence strongly suggest that the Central Palisade was older

than the Kitchen and that the pickets were torn down when it was built. The Kitchen and the Great Hall appear to have been built about the same date, perhaps about 1785. At about the same time, the palisades were extended northward, north, and northeast to enclose an additional area of about one acre.

The ground on which the Kitchen was built had been wet during the fur trade era due to poor drainage and continues so today. A partial solution to this problem was to place drainage ditches to its front and rear to drain off excess water.

Within the Kitchen building were found approximately 15,000 artifacts. Most numerous, of course, were the familiar roseheaded nails. A close second were thousands of fragments of broken dishes, mainly of creamware and pearlware. Also present in great quantities were fragments of broken liquor bottles. A moderate amount of woodworking tools and bar iron stock were found. A variety of pieces of building hardware afforded clues about the building's doors and windows. Common, too, were many personal possessions such as firesteels, beads, buckles, brass tinklers, and clay pipe stems and bowl fragments. Less common were firearms components. Cutlery in the form of steel, knives, forks, and spoons was relatively common.

Collectively, these artifacts reveal a surprisingly detailed picture of late eighteenth century life at a remote wilderness fur trade depot. In simple terms, they can be divided into four major classifications: building hardware, components, and tools; personal possessions and trade materials; household goods; and artifacts of native origin. In general, these artifacts depict the construction and demolition of

the Kitchen building; some of its furnishings; and the cooking, eating, and drinking which went on within it from about 1785 to 1803.

In the present artifact descriptions and analysis, much attention has been paid to the plentiful ceramics and glassware. They have been thoroughly analyzed and placed into classifications. Where possible, comparisons have been made with similar late eighteenth century sites and their artifact yields. Enough evidence has been found to provide much data for interpretation of life at this depot site; and of its furnishings. Significant information concerning the diet here has been provided from a combination of literary evidence and faunal materials.

Much significant evidence has been provided on the functional usage of space within the Kitchen building by the analysis of the artifact distributions. The "working face" of the fireplace was its southern aspect which fronted onto a doorway that led to the center of the rear of the Great Hall. Porches surrounded the building on the east, south, and north sides. They were convenient areas under which quantities of trash was thrown. A popular trash dump and lounging area was at a porch near the front door. Social activities appear to have taken place in front of the fireplace mouth. A food preparation area seems to have been east of the fireplace. Liquor was consumed to the rear of the fireplace and trash thrown out a rear door. Absolutely no evidence was found which indicated that an oven had been built adjacent to the fireplace.

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APPENDIX I. ARTIFACT DISTRIBUTIONS

FOOD PREPARATION & CONSUMPTION: ANIMAL BONE; 860 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N					.05	.003
30W/60N			.03	.03	.02	.002
30W/50N	.001	.003	.05	.02	.01	.009
30W/40N	.02	.001	.006	.04	.08	.02
30W/30N	.002	.05	.22	.006	.007	.002
30W/20N		.055	.12	.008	.004	.01

FOOD PREPARATION & CONSUMPTION: KETTLE BRASS, CUTLERY, TEA
KETTLE SPOUTS & UTENSIL HANDLES; 106 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N			.08	.06	.04	.01
30W/60N				.18	.04	.01
30W/50N		.02		.03	.13	.05
30W/40N			.01	.01	.03	
30W/30N		.05	.04	.01	.03	
30W/20N		.02	.06	.01		.04

FOOD CONSUMPTION: PEARLWARE; 1076 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N					.005	.001
30W/60N		.002	.04	.08	.08	.01
30W/50N		.004	.004	.19	.09	.002
30W/40N		.005	.005	.32	.02	.003
30W/30N		.003	.01	.008	.04	.02
30W/20N		.001	.005	.008	.01	.003

FOOD CONSUMPTION: CREAMWARE; 649 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N				.22	.001	.001
30W/60N		.006	.075	.14	.005	.001
30W/50N	.001		.02	.015	.003	
30W/40N	.007	.001	.08	.22	.01	.005
30W/30N	.003	.01	.007	.03	.02	
30W/20N	.001	.04	.006	.06		

FOOD CONSUMPTION: PORCELAIN; 77 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N						
30W/60N			.01			.07
30W/50N						.03
30W/40N		.01	.04	.01	.01	.01
30W/30N		.07	.27	.05		.03
30W/20N		.04	.27	.03		.03

FOOD CONSUMPTION, TABLE CERAMICS: CREAMWARE, PEARLWARE, & PORCELAIN; 1802 SPECIMENS

	20W	10W	OE/W	10E	20E	30E
30W/70N					.08	.001
30W/60N	.001	.03	.08		.10	.002
30W/50N	.003	.002	.12		.06	.002
30W/40N	.007	.005	.22		.09	.004
30W/30N	.006	.03	.016		.03	.005
30W/20N	.003	.014	.02		.01	.03

FOOD STORAGE & CONSUMPTION: CERAMICS: EARTHENWARE, STONEWARE, & PORCELAIN; 1936 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N					.08	.001
30W/60N	.001	.03	.08		.09	.002
30W/50N	.003	.003	.11		.06	.002
30W/40N	.002	.008	.21		.09	.004
30W/30N	.001	.004	.05	.01	.03	.005
30W/20N		.003	.014	.018	.01	.02

BUILDING MAINTENANCE & DEMOLITION; WINDOW GLASS: 345 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N				.08	.003	
30W/60N	.10	.04	.03	.02	.04	.003
30W/50N	.023		.04	.006		
30W/40N	.009	.06	.07	.03	.02	.01
30W/30N	.011		.06	.01	.04	.003
30W/20N	.003	.02	.05	.02	.03	

BUILDING MAINTENANCE & DEMOLITION: NAILS & NAIL FRAGMENTS: 2611 SPECIMENS

				.007							
	.002	.02	.08	.02	.014	.0007					
	.001	.003	.25	.04	.01	.02					
	.02	.02	.09	.03	.03						
	.03	.12	.02	.02	.04	.007					
	.02	.05	.02	.001	.02						

30W/70N

30W/60N

30W/50N

30W/40N

30W/30N

30W/20N

20W 10W 0E/W 10E 20E 30E

BUILDING MAINTENANCE & DEMOLITION: TOOL AND IRON BAR
STOCK DISTRIBUTION: 70 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N				.09	.01	
30W/60N	.01	.01	.03	.06		
30W/50N	.01		.17	.01		.06
30W/40N	.03	.01	.06	.07	.09	.03
30W/30N		.07		.04	.03	
30W/20N		.03	.01		.03	

BUILDING MAINTENANCE & DEMOLITION; WINDOW GLASS, NAILS, & BRASS
FLASHING: 3035 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N				.014	.0003	
30W/60N	.013	.02	.07	.02	.02	.0006
30W/50N	.004	.003	.22	.03	.01	.02
30W/40N	.004	.02	.08	.03	.03	.002
30W/30N	.007	.03	.12	.02	.04	.006
30W/20N	.003	.02	.023	.004	.02	

LEISURE ACTIVITIES: CLEAR GLASS LIQUOR TUMBLERS;
PLAIN, FLUTED, RIBBED, & ENGRAVED; 225 SPECIMENS

	20W	10W	OE/W	10E	20E	30E
30W/70N					.004	.008
30W/60N		.03	.04	.08	.04	.013
30W/50N			.02	.26	.03	.013
30W/40N		.04	.02	.08	.10	.004
30W/30N		.008	.05	.013	.02	.04
30W/20N		.004	.008	.013	.008	.013

LEISURE ACTIVITIES: ALL LIQUOR BOTTLES; 585 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N				.01		.003
30W/60N	.02	.20	.06	.03	.02	
30W/50N		.06	.08	.007	.02	.005
30W/40N	.002	.09	.05	.05	.01	.01
30W/30N	.01	.03	.07	.02	.01	.03
30W/20N	.002		.012	.01	.01	.02

LEISURE ACTIVITIES: BEADS 2622 SPECIMENS

30W/70N

30W/60N

30W/50N

30W/40N

30W/30N

30W/20N

20W

10W

0E/W

10E

20E

30E

.004

.02

.007

.002

.03

.002

.08

.005

.0003

.08

.05

.05

.03

.008

.007

.09

.02

.05

.17

.04

.05

.01

.05

.03

.004

.013

.007

LEISURE ACTIVITIES: EARTHENWARE SNUFF JAR FRAGMENTS;
121 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N						
30W/60N			.04			
30W/50N			.02	.01		
30W/40N	.02	.02	.02	.01		
30W/30N	.01	.44	.36	.01	.02	
30W/20N			.01		.01	

LEISURE ACTIVITIES: KAOLIN PIPE BOWL & STEM FRAGMENTS; 878 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N				.01	.001	.005
30W/60N	.002	.006	.02	.02	.02	.01
30W/50N	.001	.007	.001	.04	.009	.015
30W/40N	.001	.03	.03	.09	.04	.001
30W/30N	.016	.06	.16	.05	.04	.006
30W/20N	.001	.02	.09	.06	.01	.01

LEISURE ACTIVITIES: PERSONAL POSSESSIONS; 56 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N				.07		
30W/60N	.02			.02		.02
30W/50N			.07	.04	.02	
30W/40N	.02		.02	.11	.09	.04
30W/30N		.16	.11	.05	.02	.02
30W/20N		.02	.05	.02	.02	

PERSONAL NEEDS: MEDICINE BOTTLES; TURLINGTON'S BALSAM OF LIFE, ESSENCE OF PEPPERMINT, & SMALL OLIVE GREEN BOTTLES; 55 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N				.02		
30W/60N	.02	.11	.07	.04		
30W/50N					.05	.02
30W/40N	.02	.02	.04	.04		
30W/30N	.05	.04	.16	.02		
30W/20N		.02	.11	.09	.04	

GROSS ARTIFACT DISTRIBUTION

13,145 SPECIMENS

	20W	10W	0E/W	10E	20E	30E
30W/70N					.03	.002
						.003
30W/60N		.02	.074	.05	.04	.02
						.01
30W/50N		.01	.01	.12	.02	.02
						.013
30W/40N	.003	.02	.03	.09	.06	.04
30W/30N	.01	.03	.08	.03	.03	.04
						.007
30W/20N		.016	.06	.03	.01	.03

APPENDIX II: FAUNAL REMAINS FROM THE KITCHEN STRUCTURE AND VICINITY
(Identified by Catherine S. Miller)

- 101 Rib fragment Bos taurus
- 102 Rib fragment Bos taurus
- 103 M₁ lower right Cervus canadensis
- 104 Tibial tarsal fragment O. virginianus
- 106 P₂ upper left Bos taurus (very worn)
- 120 Fragment of left tibia Sus scrofa
- 121 Long bone fragment Bos taurus size
- 143 Shaft of right humerus Bos taurus
- 144 Scapula fragment (two pieces) possible O. virginianus
- 175 Rib fragment Sus scrofa
- 176 Rib fragment Bos taurus
- 177 Rib fragment Bos taurus (with partial head)
- 178 2nd phalanx Bos taurus
- 179 Fragment of glenoid cavity, possible Sus scrofa
- 180 Fragment of long bone, possible Gallus gallus
- 181 I₁, very young Sus scrofa
- 189 Tibial tarsal fragment Bos taurus
- 238 Rib fragment Bos taurus
- 239 Head of fibular tarsal O. virginianus
- 240 P₂ upper right Bos taurus
- 256 1st phalanx fragment Bos taurus
- 256 1st phalanx Sus scrofa
- 265 Rib fragment Odocoileus virginianus
- 274 Intermediate carpal Odocoileus virginianus
- 275 Tooth fragment of Bos taurus size
- 275 Molar fragment Bos taurus (very worn)

- 285 Long bone fragment Bos taurus size (cuts on surface)
- 286 Head of fibular tarsal Sus scrofa
- 304 Left humerus Sp? (small bird, possible game hen)
- 305 Right coracoid Sp (small bird, possible game hen)
- 306 Right ulna, distal end, Gallus gallus
- 307 Right radius, distal end, Gallus gallus
- 308 Fragment of ischial crest Bos taurus (has cuts on surface)
- 309 Rib fragment Bos taurus
- 310 Rib fragment Odocoileus virginianus
- 311 Fragment of long bone, possible tibia of Sus or Odocoileus
- 312 Fragment of tibial tarsal Sus scrofa
- 313 Fragment of long bone, possible radius of Sus or Odocoileus
- 314 Molar fragment, probable Bos taurus
- 315 M₁ upper left fragment Bos taurus (very worn)
- 316 P₁, split, probable Bos taurus
- 332 1st phalanx, Metatarsal II or IV Sus scrofa
- 342 Fragment of long bone O. virginianus
- 343 Rib fragment Odocoileus virginianus (white)
- 420 M fragments slightly worn Cervus canadensis
- 420 M₃ lower left Odocoileus virginianus
- 421 Right tibial tarsal, Bos taurus
- 422 Right ulna, proximal end, Cervus canadensis
- 423 Left radius, proximal end, Cervus canadensis
- 437 Right humerus, distal end, Cervus canadensis
- 456 Left ulna, head and notch, Odocoileus virginianus

- 459 Right ilium, fragment, Odocoileus virginianus
- 463 Right radius, proximal end Odocoileus virginianus
- 464 M₃ upper right, Sus scrofa
- 518 Right fibular tarsal, proximal epiphysis Sus scrofa
- 554 Radius, left proximal end, unidentified bird
- 636 I₁, Bos taurus
- 637 (15) Fragments unworn or slightly worn teeth (cheek) Bos taurus
- 650 Vertebra, centrum, Ictalurus punctatus
- 696 Unidentified tooth fragment
- 762 M fragments unworn Bos taurus
- 801 Fibular tarsal, fragment, Sus scrofa
- 801 Caudal vertebra, fragment, Sus scrofa
- 801 Rib, head and fragment of neck, Sus scrofa
- 801 Epiphysis of femur head, Odocoileus virginianus or Sus scrofa
- 801 Left fibular tarsal epiphysis, proximal, Sus scrofa
- 812 Modified 2nd vertebra, Ictalurus punctatus
- 861 Ulna, right, possible Sylvilagus (sp)?
- 895 Radius, proximal end fragment, Cervus canadensis
- 905 Tarsometatarsus, right distal end, Gallus gallus
- 905 Ulna, right, possible Sylvilagus (sp)?
- 905 Radius, right, distal end, unidentified small bird
- 922 M fragments unworn Bos taurus
- 938 M₃ Lower left, Sus scrofa
- 938 M₂ Lower right Sus scrofa (with roots)

- 939 (4) Fragments of long bones, Bos taurus
- 939 (4) Left rib (whole), also fragments, Bos taurus
- 939 Fragment rib head, Bos taurus
- 939 Fragment rib Sylvilagus sp?
- 939 Left humerus, shaft and distal condyle, Sylvilagus sp?
- 939 Unidentified rib fragment
- 939 Unidentified fragment, possible phalanx, Meleagris gallopavo
- 939 Unidentified fragment
- 939 Skull fragment, Bos taurus
- 939 Tarsal, possible third, Sus scrofa
- 939 Fragment of phalanx without epiphysis, Bos taurus
- 939 Left tibial tarsal, Odocoileus virginianus
- 939 Partial fragment, tibial tarsal, Bos taurus
- 939 Unidentified fragment, possible tibial tarsal, deer size
- 939 Fragment of iliac crest, os coxae, Odocoileus virginianus
- 939 Fragment of right scapula, acromion ridge visible, Odocoileus virginianus
- 939 Fragment of scapula, glenoid cavity, Odocoileus virginianus
- 939 Fragment of vertebra, Bos taurus
- 939 Fragment of skull, occipital condyle, Odocoileus virginianus
- 939 Fragment of ischium, os coxae, Bos taurus
- 939 Fragment of tibial tarsal, proximal end, Cervus canadensis
- 939 Fragment of phalanx, distal, Possible Bos taurus or Cervus canadensis
- 939 (4) Fragment of ribs, Bos taurus
- 939 Fragment of ribs, deer size
- 939 Fragment of long bone, deer size
- 939 Left coracoid, Gallus gallus

- 939 Left coracoid, fragment, Meleagris gallopavo
- 939 Fragment of tibiotarsus, Meleagris gallopavo
- 939 Fragment of radius shaft, Meleagris gallopavo
- 939 (3) ribs, fragments, Meleagris gallopavo
- 967 I₁, upper left, Sus scrofa
- 1064 (3) Fragments of molars Bos taurus unworn
- 1069 M₂ upper left, slightly worn, Cervus canadensis
- 1069 M₁ (2) upper right, slightly worn, Cervus canadensis
- 1070 Rib fragment, Bos taurus
- 1071 Skull fragment, Bos taurus
- 1102 M₂ lower right, worn, Cervus canadensis
- 1110 M₃ upper left Sus scrofa
- 1166 Skull fragment, Sus scrofa
- 1196 M₂ fragments unworn Bos taurus
- 1227 M₂ lower left, slightly worn, Bos taurus
- 1227 M₁ fragment, Bos taurus
- 1228 Rib fragment, flat, Bos taurus
- 1228 Rib fragment, Bos taurus
- 1228 First phalanx, Bos taurus
- 1228 (2) Fragments, tibial tarsal, Sus scrofa
- 1228 Right humerus, fragment, Gallus gallus
- 1228 Right scapula, distal portion, Sylvilagus sp?
- 1228 Centrum, caudal vertebra, Ictalurus punctatus

- 1228 Centrum, caudal vertebra, Pogonias cromis
- 1228 Rib, Gallus gallus
- 1228 Tibia, possible Sylvilagus sp? or Scurius sp?
- 1228 Rib, Meleagris gallopavo
- 1228 Rib, fragment, Bos taurus
- 1228 Nasal bone fragment, Bos taurus
- 1239 Left ulna, proximal end, Cervus canadensis
- 1278 M₃ lower right, Sus scrofa
- 1320 M₃ lower right, very worn, Odocoileus virginianus
- 1320 M₂ lower right, very worn, Odocoileus virginianus
- 1320 M₂ lower left very worn Odocoileus virginianus
- 1320 M₂ upper left, very worn, Odocoileus virginianus
- 1320 M₂ upper right, very worn, Odocoileus virginianus
- 1321 P₃ upper left, Sus scrofa
- 1322 Right coracoid unknown bird
- 1322 Left carpometacarpus unknown bird
- 1322 Unidentified long bone bird
- 1339 Left mandible with cheek teeth, Sylvilagus sp?
- 1340 P₂ lower right, Odocoileus virginianus
- 1340 P₃ lower right, Odocoileus virginianus
- 1340 P₃ lower left, Odocoileus virginianus
- 1340 M₁ Upper right, Odocoileus virginianus
- 1340 M₃ Lower right, Odocoileus virginianus
- 1340 M₃ Lower left, Odocoileus virginianus

- 1341 Left femur, unidentified bird
- 1341 Right humerus, distal end, unidentified bird
- 1341 Left carpometacarpus, missing III metacarpal, unidentified bird
- 1341 Right tibiotarsus, unidentified bird
- 1341 Left fibula, unidentified bird
- 1341 Right tarsometatarsus, unidentified bird
- 1341 Fragment of neural spine, Sus scrofa
- 1341 Fragment of glenoid cavity, scapula, possible Sus scrofa
- 1341 Fragment of tibial epiphysis Sus scrofa
- 1341 Unidentified fragment
- 1341 Caudal vertebra Ictalurus punctatus
- 1372 M₃ lower left Sus scrofa
- 1372 (3) M₂ upper right Sus scrofa
- 1373 Vertebra, centrum Ictalurus punctatus
- 1395 M₂ upper right Bos taurus
- 1404 M₃ lower right Odocoileus virginianus
- 1404 (2) fragments of molars Bos taurus slightly worn
- 1405 Right first phalanx Bos taurus
- 1460 M₂ slightly worn Bos taurus
- 1460 (3) I, lower Bos taurus
- 1476 Femur, head fragment Bos taurus
- 1493 M₃ lower left Capra hirca
- 1493 P₂ lower left, slightly worn Cervus canadensis
- 1494 Vertebra, centrum Ictalurus punctatus

- 1507 Right tibia Sus scrofa
- 1507 Left tibia, epiphysis Sus scrofa
- 1517 Vertebra, centrum Ictalurus punctatus
- 1517 Right tibia, distal end Cervus canadensis
- 1586 M₁, upper right Bos taurus
- 1666 M fragments slightly worn Bos taurus
- 1668 (2) C₁, fragments, Sus scrofa
- 1700 Fragments of molars Bos taurus (3)
- 1700 I₂, lower right Sus scrofa
- 1708 M₂, upper right Bos taurus (worn)
- 1708 P₄, lower right Bos taurus (fragment)
- 1709 Proximal end and shaft, left metacarpal Bos taurus
- 1757 (6) Fragments of molars without wear Bos taurus
These teeth seem never to have broken the gum.
- 1792 P₄, upper left Castor canadensis
- 1792 P₄, upper right Castor canadensis
- 1792 M₂, lower right Castor canadensis
- 1792 M₂, lower left Castor canadensis
- 1792 M₃, lower left Castor canadensis
- 1792 M₃, lower right Castor canadensis
- 1793 P₂, upper right Bos taurus
- 1793 M₃, lower right Odocoileus virginianus
- 1793 (2) M₂, lower left, unworn Bos taurus
- 1793 M₃ lower right, very worn Cervus canadensis
- 1793 (2) M₂, fragments, slightly worn Bos taurus

- 1794 Radius, distal end without epiphysis Sus scrofa
- 1795 Fibular tarsal, right shaft Sus scrofa
- 1796 Ulna, left with missing distal end Meleagris gallopavo
- 1817 M₃, lower right Sus scrofa (1/3 missing)
- 1817 M₃, slightly worn Bos taurus
- 1817 M₃, lower right Capra hirca
- 1818 Vertebra, fragment Bos taurus
- 1818 Right tibia, epiphysis Sus scrofa
- 1850 M₂, upper right, slightly worn Bos taurus
- 1850 M₂, upper right, slightly worn Cervus canadensis
- 1850 M fragment Capra hirca
- 1851 Tarsal, probable fused central and 4th Bos taurus
- 1851 Tibia, proximal end fragment Sus scrofa
- 1851 Right tibial tarsal, fragment Sus scrofa
- 1851 Left accessory carpal Bos taurus
- 1888 M₂, lower left, slightly worn Bos taurus
- 1889 M₂, lower left Sus scrofa
- 1890 First phalanx, III metatarsal Meleagris gallopavo
- 1904 M₃, lower left Sus scrofa
- 1904 M₃, upper right Sus scrofa
- 1905 Caudal vertebra Bos taurus
- 1930 P₄ upper right Castor canadensis
- 1930 M₁ upper right Castor canadensis

- 1930 M₂ upper right, Castor canadensis
- 1930 M₃ upper right, Castor canadensis
- 1930 M₂ lower left, Castor canadensis
- 1931 M₃ lower right, Bos taurus (no wear)
- 1931 M₃ lower left, Bos taurus (very worn)
- 1931 M₁ upper left, Bos taurus (slightly worn)
- 1931 M₁ upper right, Bos taurus (almost no wear)
- 1931 M₂ upper left, Bos taurus (much wear)
- 1931 M₃ lower left Odocoileus virginianus
- 1931 M₃ lower right Capra hirca
- 1931 M₂ lower right Capra hirca
- 1931 M₂ lower left Capra hirca
- 1931 M₁ lower left Capra hirca
- 1931 M₁ lower right Capra hirca
- 1932 C₁, lower right Sus scrofa
- 1933 Right tibia, distal end Ondatra sp?
- 1933 Left tibia fragment Ondatra sp?
- 1933 Right humerus, distal end Bos taurus
- 1933 2nd phalanx Bos taurus
- 1933 Left tibia, proximal end Bos taurus
-
- 336-2-12 M₃ Upper left, Bos taurus (young)
- 336-2-12 M fragment Bos taurus (young)
- 336-2-12 M₁ Upper right Bos taurus
- 336-2-13 Incisor, Bos taurus
- 336-3-12 Skull fragment, Sus scrofa

- 336-3-12 Fragment of long bone, Bos taurus size
- 336-8-16 Fragment of long bone, Sus scrofa
- 336-8-16 Head of left femur, Odocoileus virginianus
- 336-10-14 M fragment, Bos taurus
- 336-10-14 M fragment, Bos taurus (young)
- 336-12-4 Unidentified rib fragment
- 336-12-16 M₃ (2/3) lower, Bos taurus very worn
- 336-12-16 M₃ Lower right, Bos taurus very worn
- 336-12-17 Glenoid fossa and beginning blade of right scapula, Bos taurus
- 336-12-17 Fragment of phalanx, Bos taurus
- 336-13-11 Fragment of rib, sus scrofa
- 336-16-13 P₃ Upper right, Bos taurus
- 336-16-13 M₂ Upper right, Bos taurus
- 336-16-13 M₂ Upper left, Bos taurus
- 336-16-13 M₂ Castor canadensis
- 336-16-18 Fragment of rib, Bos taurus
- 336-16-18 Fragment of rib, Sus scrofa
- 336-16-18 Unidentified fragment
- 336-16-18 Rib fragment, Bos taurus
- 336-16-18 Fragment of long bone, Sus scrofa
- 336-16-18 Unidentified rib fragment
- 336-24-2 Fragment of rib, Sus scrofa
- 336-24-2 Rib, flat, possible Odocoileus virginianus
- 336-24-10 M₁ lower left Bos taurus
- 336-25-12 Right ulna, Bos taurus
- 336-25-12 Skull fragment, includes squamosal, auditory bulla and partial zygomatic arch, left, Bos taurus

- Fragments of young Bos taurus (unnumbered)
- Unnumbered M₃ lower right Bos taurus
- Unnumbered (2) fragments of skull Sus scrofa
- Unnumbered M₃ lower right, unworn fragment Cervus canadensis
- Unnumbered M₃ fragment Bos taurus (young)
- M₂, lower left Sus scrofa (unnumbered)
- Tooth fragment of Bos taurus size (unnumbered)