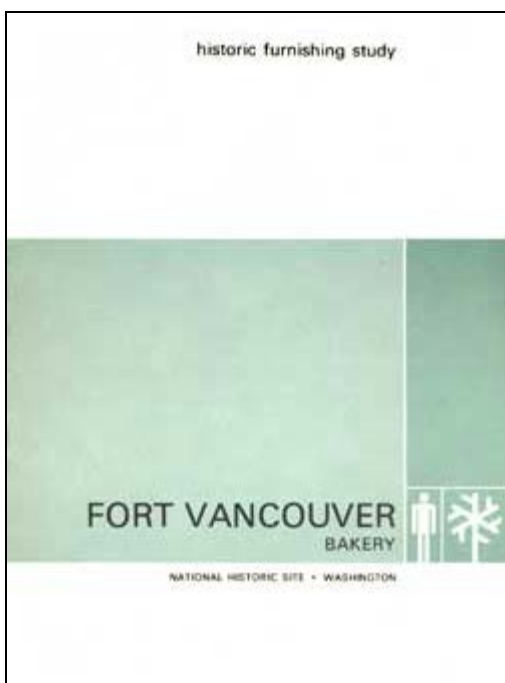


Fort Vancouver

Historic Furnishings Report: Bakery



Historic Furnishings Report Bakery

by
John A. Hussey
Historic Preservation Team

December 1973

Denver Service Center
National Park Service
U.S. Department of the Interior

[TABLE OF CONTENTS](#)

Fort Vancouver

Historic Furnishings Report: Bakery



TABLE OF CONTENTS

[COVER](#)

[PREFACE](#)

[LIST OF PLATES](#)

[LIST OF FIGURES](#)

[CHAPTER I.](#) Specific Available Data

[CHAPTER II.](#) Comparative Data: The Baking Process during the 1840's

[CHAPTER III.](#) Comparative Data: Ovens

[CHAPTER IV.](#) Comparative Data: Bakery Layout and Equipment

[CHAPTER V.](#) Comparative Data: Other Furnishings

[CHAPTER VI.](#) Recommendations

[APPENDIX](#)

[BIBLIOGRAPHY](#)

[PLATES](#)

LIST OF PLATES

- [I.](#) Contents of a cache of 1853 [showing a Royal Navy sea biscuit].
- [II.](#) "Old bake oven" in one of the bastions at Lower Fort Garry, 1935.
- [III.](#) Reconstructed H.B.C. bake ovens in Northwest Bastion, Lower Fort Garry.
- [IV.](#) Oven entrance details, Northwest Bastion, Lower Fort Garry.
- [V.](#) Plan of twin ovens in Northwest Bastion, Lower Fort Garry.
- [VI.](#) Photograph labeled "bakery fireplaces, c. 1935," Lower Fort Garry.
- [VII.](#) A typical Hudson's Bay Company square-headed axe. Hand-operated biscuit stamps.
- [VIII.](#) Utensils employed during demonstrations of early 19th century baking methods,

Officers' Kitchen, Fort York

[IX](#). Detail of iron rake or rooker, Officers' Kitchen, Fort York.

[X](#). Interior of H. B. C. Post at Pembina, 1848.

[XI](#). Interior of a Red River settler's house, early 19th century.

LIST OF FIGURES

[1](#). Foundation plan, 1844 Bakery

[2](#). Loading wood faggots into an English country bake oven

[3](#). A Medieval bakery

[4](#). Diagram of one of two baking chambers in the Stable, Lower Fort Garry

[5](#). Design for an English "common country oven," c. 1830-1860

[6](#). An English bake oven, c. 1847

[7](#). Diagram of a typical French bake oven, c. 1760

[8](#). French bake oven door, c. 1760

[9](#). Drawings of a wood-burning oven recommended for use by the U. S. Army, 1864

[10](#). An early 19th century bakery

[11](#). A two-oven bakehouse in 1842

[12](#). An English bakehouse about 1854

[13](#). "Scaling off" in an English bakery, c. 1854

[14](#). Plans of small peel-oven bakehouses, 1911

[15](#). Canadian tin candlesticks, 1763-1830

[16](#). Various utensils used by French bakers, late 18th century

[17](#). A French baker's rasp, late 18th century

[18](#). One type of single "Canada" stove

[19](#). Kneading trough in an English bakery, c. 1854

[20](#). A wooden dough trough, c. 1903

[21](#). Tin sconces used in Canada, c. 1763-1830

[22](#). Acadian and French Canadian chairs

[23. Suggested oven complex design](#)

[24. Suggested arrangement of larger furnishings in bakery](#)

[<<< Previous](#)

[<<< Contents >>>](#)

[Next >>>](#)

fova/hfr1/hfrt.htm
Last Updated: 28-Nov-2005

Fort Vancouver

Historic Furnishings Report: Bakery



PREFACE

The bakery which was in operation at Fort Vancouver during 1845-1846, the period to which the fort is to be reconstructed, was completed during the fall of 1844. What is known of the appearance and physical structure of this building is outlined in volume I of the Historic Structures Report, Historical Data, Fort Vancouver, which was submitted during June, 1972. That same document also reproduces such meager inventories of the bakery's furnishings as exist for the general 1845-1846 period.

It was subsequently determined that additional information about early 19th century bake ovens and bakery furnishings was required before architects and curators could actually prepare plans for rebuilding and refurnishing the structure. The present study is intended to provide additional data "needed to determine the nature and extent of historic furniture and furnishings of this building, including ovens." The work was conducted under authorization of Professional Services Contract No. CX-2000-3-0092.

In preparation for the writing of this study, further research was conducted in the Hudson's Bay Company Archives through the use of the microfilm copies in the Public Archives of Canada. For permission to use and quote from these records the writer extends his thanks to the Hudson's Bay Company and, in particular, to Mrs. Joan Craig, Archivist, Hudson's Bay Company, London.

This report owes much to the generous assistance of many persons. A special debt is acknowledged to Mr. Wayne Colwell, Curator, Canadian National Historic Sites Service, whose vast store of knowledge concerning the techniques of the fur trade was freely made available. He supplied source references of major importance and assisted with the illustrations. Mr. William M. Pigott, President, and Miss Joan Halloran, Research, of National Heritage Limited, Toronto, also made a major contribution toward this study by providing access to that firm's comprehensive research files.

In Washington, D. C., Dr. A. R. Mortensen, Chief Historian, and Mr. Harry W. Pfanz, of the Office of History and Archeology National Park Service, facilitated the use of the Library of Congress; and Mr. Mike Musick, of the NMO staff of the National Archives, was particularly efficient in finding pertinent materials. Mr. James Sheire, National Park Service historian in Washington, provided copies of his earlier studies of United States Army bake ovens at Fort Laramie.

At the Denver Service Center, National Park Service, Mr. Merrill J. Mattes, Manager, Historic Preservation Team; Mr. F. Ross Holland, Jr.; and Mrs. Helen Hoy have facilitated this study in numerous ways. Particular thanks are extended to Historian Erwin N. Thompson, who not only provided copies of his fine reports on the structures at the Grand Portage depot of the North West Company but supplied illustrative and research materials of major significance.

Mr. J. A. McGinnis, Managing Director, Toronto Historical Board, generously provided photographs of the equipment used in operating the bake oven at Fort York. At Fort

Vancouver National Historic Site Project Archeologist J. J. Hoffman assisted with sound advice and valuable information derived from the excavations conducted under his direction.

Special thanks are given to Miss Caroline Dudley, Keeper of Archaeology, Art Gallery and Museums Department, The Royal Pavilion, Brighton, England, who generously supplied photographs and drawings of biscuit stamps in the collections under her care. Mr. John S. Creasy, Assistant Keeper, Museum of English Rural Life, Reading, provided valuable information concerning sources of information relating to baking and bakeries in nineteenth century England, as did Mr. D. Campbell, Department of the Environment, London. Mr. David Fleming of the Historical Research Section, Canadian National Historic Parks and Sites Branch, assisted with information on the bakeries at Lower Fort Garry, Manitoba. Consultations with Mr. A. Lewis Koue, retired National Park Service architect and expert on Hudson's Bay Company building techniques, were most helpful in formulating recommendations regarding the bakery structure.

John A. Hussey

Piedmont, California
December 1, 1973

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

fova/hfr1/hfr0.htm
Last Updated: 28-Nov-2005

Fort Vancouver

Historic Furnishings Report: Bakery



CHAPTER I:

SPECIFIC AVAILABLE DATA

General description of bakery

The physical structure of the 1844 bakery has been treated in considerable detail in the Historic Structures Report, Historical Data, Fort Vancouver, vol. I. Since the dimensions and general arrangement of the rooms, together with such matters as the locations of doors and windows, must necessarily influence the furnishings, however, a brief description of the building is provided here as a matter of convenience. Also, the availability of the final report covering archeological excavations at the bakery site permits certain facts to be stated with more assurance than could be done previously.

The main bakery structure was about 40 feet by 25 feet, with the long walls running north and south. It stood half within the east stockade line and half without, the pickets butting against the short north and south walls at their midway points. The building was a story and a half high with a simple gabled roof. The ridge line paralleled the long walls. Available pictures seem to show the eaves at about the same level as the tops of the pickets, but the height of the stockade at the times of the pictures is not known with certainty. [1] It is not likely that the tops of the walls were more than 13 to 14 feet above the ground.

Enough footings were uncovered during archeological excavations to demonstrate that the main bakery building was constructed in the usual Canadian or Hudson's Bay style, with heavy upright grooved posts set at intervals of approximately 10 feet along massive sills, the spaces, between the posts being filled with horizontal squared timbers to complete the walls. The footings, also spaced about 10 feet apart, were blocks of wood averaging about 2-3/4 feet long, 1 foot wide, and 3 inches thick. It could not be determined whether these footings were originally placed on the contemporary ground surface or sunk below it. Since no traces of a packed earth, stone, brick, or tile floor were found, it is highly probable that the bakery had a wood floor. [2]

Concentrations of glass fragments in the western portion of the bakery and outside the west wall appear to indicate the presence of several windows on that side of the structure. Shutter latch nails hint that the windows were shuttered. The archeologists theorized that there was a doorway in the west wall with a pathway leading to two outhouses directly north of the bakery. If the sills were raised even slightly off the ground, there probably was at least one step in front of the door.

Contemporary pictures of the bakery show a window in the north gable wall. It can be assumed, therefore, that there was a garret or attic which was intended for use. In keeping with usual Company building practices and in accordance with pictorial evidence as to the height of the walls, it is virtually certain that the sides of this attic for three or four feet above its floor were formed by the continuations of the bakery walls for that distance above the ceiling of the ground floor. The rafters and roof would have formed the attic ceiling above

the tops of those walls.

Adjoining the main bakery structure on the east was a wooden shed which sheltered the bake ovens. The generally accurate Vavasour plan of 1845 (see Plate VII, Historic Structures Report, vol. I) shows this appendage as measuring about 25 feet by 15 feet, but archeological excavations have demonstrated that these were the dimensions of the ovens alone. As a precaution against fire the covering shed almost certainly must have stood clear of the oven sides by at least a short distance. Therefore this shed very probably measured about 28 feet by about 16-1/2 feet on the outside. Seemingly it had no exterior doors or windows. No traces of this shed were found by the archeologists. Thus its method of construction and exact dimensions must remain in doubt. Very probably its exterior walls were composed of heavy vertical planks or slabs nailed to a substantial frame. It almost certainly had no floor other than the ground, since most of its interior was occupied by the ovens.

Except for a few inches on each side of the oven complex, the west end of the shed undoubtedly was entirely open to the main bakery. Probably the whole width of this opening was filled by the brick face of the oven complex which appears to have been directly on the line of the main bakery's east wall. From the face of the ovens two chimneys rose to about the height of the roof ridge. [3]

Description of ovens

The historical record provides little evidence concerning the design of the 1844 bakery ovens at Fort Vancouver. On September 17 of that year Clerk Thomas Lowe at Fort Vancouver noted in his journal the arrival of a barge from the vicinity of the present Oregon City with 5,000 bricks on board. These bricks almost certainly were intended for the ovens in the bakery then under construction, for on October 15 Lowe recorded, "The New Bake House is also nearly completed." [4]

The inventory of "New Stores" made at the Fort Vancouver Depot in the spring of 1845 listed "450/1000 ~~M~~ Tiles p Ovens." [5] Thus it would appear that tiles were also used in the fabric of the ovens as was frequently the practice at bakeries generally in the mid-nineteenth century, but whether 450 indicates the number of tiles to be used to line the ovens or merely the remainder after the ovens had been completed is not evident.

Dr. H. A. Tuzo, who reached Fort Vancouver in November, 1853, to take up his duties as physician, recalled that the bakery contained two "superior fire-brick ovens." It could, he said, bake for from 200 to 300 men. [6]

Archeological excavations have thrown a bit more light on the picture. During the winter of 1970-1971 two widely separated fragments of the bakery oven foundations were uncovered, one section of the north wall and a larger segment at the southeast corner of the oven complex. Upon final analysis of these findings, the archeologists estimated that the original complete foundations bounded a rectangle "in excess of 25.0 feet north-south and more that 15.0 feet east west." [7]

The foundation remnants were from 1.6 to 2.0 feet wide. They were formed of "rounded cobbles averaging about 0.7 foot in diameter." They were laid in a single course without sub-footings. "Lime mortar, possibly of Hawaiian coral, was present on top and in between the cobbles but not underneath." The oven foundations were at the same ground level as the wooden footings of the main bakery structure. [8]

No bricks were found in situ in the bakery area, nor were any complete bricks recovered; but

brick fragments were scattered about in relative abundance. Based upon composition and relative hardness, these fragments seem to fall into nine types or classes of brick. One of the types most abundantly represented appears to correspond to bricks 8-1/2" x 4" x 2-1/2" excavated at Fort Vancouver during the late 1940's or early 1950's. Since these dimensions are the same as those established by statute for bricks made in England, the archeologists have speculated that bricks of this class were imported by the annual supply ships from London. The most abundantly represented type of brick had rather similar dimensions — 1-3/4" and 2-1/4" thick, 3-3/4" or 4-1/4" wide, with length unknown. The origin of these bricks is not known, but they could have been from the Willamette Valley, where bricks seem to have been made on a small scale at least as early as 1341. [9]

The archeological evidence thus confirms the historical record to the effect that the main structure of the ovens was of brick. As far as yet reported, no tile fragments were found at the bakery site. [10]

Operation of the bakery

No records thus far examined provide a clear picture of the bakery in operation. Neither the range of products turned out there nor the quantity of any one product is known with certainty. As shall be evident in sources cited in this section, contemporary documents speak of both "bread" and "biscuit" being baked at Fort Vancouver; but as will also be clearly seen, these terms were often synonymous, at least to the extent that "bread" often meant "biscuit." Thus when an account book records a charge for baking a stated quantity of flour into "bread," one cannot always be sure whether loaves of bread or "hard bread" (biscuits) were meant. Almost always it was the latter.

Yet it appears almost certain that at least some loaf bread was produced by the Fort Vancouver bakery. Such at least is the implication of the words of Samuel Parker, who visited the post in 1835. "There is a bakery here," he noted in his journal, "in which two or three men are in constant employment, which furnishes bread for daily use in the fort, and also a large supply of sea biscuit for the shipping and trading stations along the north-west coast." [11] References to such items as "dough cutters" and "yeast Tubs" in inventories of the bakehouse furnishings also tend to point in this direction, although, as shall be seen certain formulas for biscuit-making also called for the use of "leaven" or yeast.

Lest there be any question on the subject, however, it should be made clear at this point that loaf bread was regularly produced at Fort Vancouver. In 1837 Miss Anna Maria Pittman, a member of the Methodist mission in the Willamette Valley, spoke of "bread and butter" as being among the foods, "all of their own make, and excellent too," which she enjoyed while a guest at the Company's depot on the Columbia. [12] A year later the post chaplain, the Reverend Herbert Beaver bitterly commented that wheat and other grains were frequently so poorly cared for at Fort Vancouver that they became "from dirt almost unfit for use, as our bread at sundry times has testified." [13] But such bread, perhaps turned out mainly for the "gentlemen's" mess table in the Big House and for other specially qualified residents within the stockade, could have been baked in the post kitchen rather than in the bakery.

Beyond any doubt, however, the main business of the Fort Vancouver bakery was turning out biscuit of the variety known today as "hard-tack." In 1838 the weekly ration of the ordinary workman at the depot included three pounds of "Bread or Potatoes." [14] That "Bread" in this instance meant biscuit is shown by the fact that after August, 1841, when a change was made in the food allowance, the "usual ration p. day" included "1-1/2 lbs. Biscuit," though when potatoes were available the men each received one bushel of them a week in place of the biscuit. [15]

Even if providing this daily ration of biscuit to the laboring force at Fort Vancouver had been the only function of the bakery, the bakers would have been kept busy. The number of "servants" at the depot fluctuated constantly during the year as the brigades and various types of work parties arrived and departed. In 1843 Chief Factor McLoughlin admitted to having had 149 men on his list during the previous winter, but he told the London directors that after the departure of all the field parties during the spring and summer "we find ourselves weak." [16]

For Outfit 1845 the Fort Vancouver roll for the depot, sale shop, Indian trade, and general charges, excluding officers and clerks, numbered 249 men. [17] Of course, not all of these servants were actually stationed at Fort Vancouver even during the winter, and many others were away for long periods. Nevertheless, it can be seen that Dr. Tuzo's testimony that the fort's ovens could bake for from 200 to 300 men was not too much of an exaggeration even if he was referring only to baking for the depot staff.

But the Fort Vancouver bakery provided biscuit for a far larger clientel than the laboring force on the lower Columbia. It is known that certain posts, such as Fort Colville, had bake ovens of their own, so how far the depot went in furnishing bakery products to the scattered interior and Northwest Coast forts is not known. Records thus far examined do not appear to provide much information on this subject. The bake ovens at Lower Fort Carry in the present Manitoba regularly turned out "biscuit for exportation" to other posts, however, and it is most probable that Fort Vancouver did likewise. [18]

That something of the sort took place seems indicated by an item in the Fort Vancouver accounts for Outfit 1848. The Columbia District billed the Honolulu agency \$63.25 for "Baking 23 bbls Flour into bread" and \$38.55 for seven casks for the same. [19]

The records are much clearer when it comes to demonstrating that Fort Vancouver produced much of the biscuit required for the Company's shipping in the Pacific. During Outfit 1843, for instance, the barque Columbia was charged for two hundredweight "fine Biscuit" and sixteen hundredweight of common biscuit taken aboard at Vancouver. When preparing for her homeward voyage to England during the same year the barque Vancouver was supplied with 40 hundredweight of common and eight hundredweight of fine biscuit. [20]

In any event, it is abundantly clear that there was sufficient business to justify the statement of former clerk George B. Roberts who years later recalled that four bakers were employed at Fort Vancouver. [21] The bakery process of the 1840's, as shall be developed in the next chapter of this report, required an ample supply of labor.

When the new bakery was completed during the fall of 1844 the only baker listed as such on the Fort Vancouver employee rolls was Joseph Pétrain. He continued to hold this position during Outfit 1845 (mid-1845 to mid-1846), the period of immediate interest for purposes of reconstruction and refurnishing.

Pétrain, whose name was sometimes written as Pétraint or Pétrin, was a young French Canadian from Sorel Parish, Saint David, District of Montreal. He reached Fort Vancouver on November 4, 1837, as a lad of seventeen, enrolled in the Company's service as a middleman (ordinary voyageur). By Outfit 1842 he was still a middleman at the same rate of £17 per year, but for the next outfit he was listed as "Middle & Baker" at £20 per annum. From this fact it is evident that he was acting as an assistant to Bazil Poirer, who had long been depot baker. Poirer died on or about June 30, 1844, and Pétrain succeeded him as chief of the depot bakery. [22] Undoubtedly he was assigned two or three men as assistants, though the employee rolls do not reflect this fact.

As will become evident during the discussion of the baking process in the next chapter, it is highly probable that at least one employee actually lived in the bakery. It was generally considered expedient to keep the ovens warm on a round-the-clock basis, since it took a large amount of fuel to heat them once they had cooled. Also, if ordinary loaf bread was made in large quantities, the process involved considerable work in the very early morning or at other unusual hours.

If this live-in employee was Pétrain — there seems to be no proof that it was, and there is reason to believe it was not — certain information is available which would be of assistance to those planning the refurnishing of the bakery. On April 19, 1843, at the Catholic mission at Fort Vancouver, Pétrain was married by Father F. N. Blanchet to Marie Anne Wagner, the 14-year-old daughter of Peter Wagner, once the depot butcher but since the end of 1844 retired to a farm on the Tualatin Plains, and his Chinook wife, Marie. Joseph and Marie Anne's first child, a daughter, was born at Vancouver on March 4, 1844, but she lived only a little more than a month. A second child, Joseph, came into the world on June 10, 1845, but he died about seven months later, on January 14, 1846. A third child, Joseph Ovide, was born on November 19, 1846. Marie Anne died on December 20, 1847, and her only living child, Joseph Ovide, followed her to the grave about two weeks later. [23]

Whatever the output and whatever the strength of the bakery crew, it is clear that the demands made upon the bakery exceeded what could be produced, both as to quantity and quality. As early as 1842 complaints had reached the Governor and Committee in London concerning the "bad quality of the Bread and the unsound state of the Salted Meat" provided at Fort Vancouver for use in the Company's vessels. "From the specimens we saw of the Bread and Meat," the directors told Chief Factor McLoughlin, "we think [these complaints] were well founded." To correct the situation as far as the bread was concerned, they announced, "we shall endeavour to send by the next ship a good Biscuit Baker." [24]

At about this same time the Russian American Company placed an order with the Hudson's Bay Company through Pelly, Simpson & Co., its London agent, for 86 hundredweight of "White Biscuit" to be "manufactured" at Fort Vancouver and shipped to Sitka during the spring or summer of 1844. When relaying this order to McLoughlin on December 21, 1842, the Governor and Committee added some remarks which throw light upon the baking practices of the day:

Although described "White Biscuit," we presume from the quantity required it must be what is known in England as second Biscuit: the last prices here were 33 s. p. Cwt. for white 21 s for second and 15/9 for third or ship Biscuit, independent of the cost of the packages; samples of which are herewith. [25]

The remarks of the directors concerning the quality of the biscuit produced under his charge and the instructions concerning the Russian order reached McLoughlin at a time when he was much troubled by personal and administrative problems. He undoubtedly was not cheered by word received during the fall of 1843 from Governor A. Etoline of the Russian American Company that a sample of the biscuit baked at Fort Vancouver had been obtained from a Hudson's Bay Company vessel. "I find," said that official, "we can bake similar to it at Sitka, and we do not require such from Vancouver, — but if you can bake Biscuit of the same quality as the sample now sent, I will be happy to take 50 cwt. at 30/- Stg. per cwt." [26]

On November 15, 1843, McLoughlin somewhat resignedly replied to the London directors. Concerning the complaints about the "Bread," he wrote, "our Baker does not understand Biscuit baking." As for the samples sent from Sir John Henry Pelly for the Russian order, he merely remarked, "I am sorry to say, our baker cannot make such Biscuit, and Governor Etholine requests, if we can send no better than our Baker makes that we send him none, as

he can make as good at Sitka." [27]

When in the course of time the London directors considered these remarks, they resolved once more to send a "biscuit baker" by the next ship to the Columbia. McLoughlin was informed of the decision by a letter dated November 30, 1844, but as far as can be determined from records searched, no more action was taken than had been the case with the similar resolve two years earlier. [28]

During early 1844 McLoughlin was asked if he would consider taking a contract to supply the U. S. Naval Agent in Honolulu with 4,000 barrels of biscuit along with substantial quantities of flour and beef. The head of the Columbia District was forced to reply that he could not undertake such a commitment due to the difficulty of obtaining labor. [29]

Perhaps it was situations such as these which caused McLoughlin to erect the new bakery in 1844. Unfortunately no records have yet been found which permit one to judge whether any significant improvement in the product resulted from the new facility.

Furnishings of the bakery

The annual inventories of Company-owned property at Fort Vancouver provide a reasonably good picture of the bakery equipment. Since the lists varied somewhat from year to year, it seems desirable to reproduce those from several inventories centering about the 1845-1846 period under consideration.

Under the heading "Articles in Use," the Fort Vancouver inventory made during the spring of 1844 contains the following list of items in the "Bake House":

- 1 round head Axe
- 1 water Bucket
- 1 Candlestick
- 2 dough Cutters
- 1 tin Kettle 8 gns.
- 2 tin Pots
- 1 tin scales
- 2 Biscuit Stamp[s]
- 1 Steelyards 100 lbs.
- 3 lead Weights [30]

The inventory of 1845 listed practically the same articles but there were a few interesting variations:

- 1 Axe
- 2 Buckets
- 1 Candlestick
- 3 pln [plain] Blankets 2-1/2 pts [points]
- 1 dough Cutter
- 1 Tin Kettle 8 gns
- 1 Tin Pot 3 qts
- 1 pr Tin Scales
- 1 Biscuit Stamp
- 1 lead Weight
- 1 pr Steelyards [31]

No listing of articles in use in the bakery seems to be available for 1846, but the Fort

Vancouver Depot inventory made in the spring of 1847 lists the following articles in the "Bake House":

- 2 Axes
- 6 Buckets
- 1 Candlestick
- 2 dough Cutters
- 2 Tin Kettles 8 gns.
- 3 Tin Pots
- 1 pr. Tin Scales
- 4 Biscuit Stamps
- 1 pr. Steelyards
- 1 lead Weights [[sic](#)]
- 18 Yds duck Sheeting
- 1 [illegible]
- 1 hand saw
- 3 Tables
- 2 Tin Pans [[32](#)]

The list in the 1848 inventory is somewhat more extensive:

-- Bakehouse --

- 2 large square headed Axes
- 1 iron weighing Beam & tin Scales
- 5 plain Blankets 3 points
- 2 water Buckets
- 1 tin Candlestick
- 2 duck sheeting table Cloths — 42 yds.
- 2 dough Cutters
- 1 Hammer
- 2 tin Kettles
- 2 tin Pans
- 1 jack Plane
- 2 tin pint Pots
- 1 hand Saw
- 1 iron Shovel
- 3 biscuit Stamps
- 1 pr beam Steelyards, to weigh 110 lbs
- 1 pr beam Steelyards, to weigh 1400 lbs
- 1 Canada single Stove 3 ft
- 3 Tables
- 2 yeast Tubs [[33](#)]

Analysis of the specific data

Although the material presented above requires little explanation, there are several points which might be made clearer by summary and additional interpretation:

1. Ground plan. Upon the basis of contemporary views and plans and upon the results of archeological excavations, the outline of the ground floor of the bakery must have been about as shown in Figure 1. It will be observed that despite the fairly ample dimensions of the main structure the room layout left no space for living quarters on the lower level.

2. Living Quarters. If it is decided to furnish a portion of the bakery as living quarters, the only persons who would seem to have been eligible to occupy the building are the post baker and/or one or two of his assistants. The identities of the assistants are not known with certainty for the 1845-1846 period, but there is a fair amount of information available concerning the baker himself, Joseph Pétrain. Unfortunately, it appears that Pétrain probably lived outside the pickets.

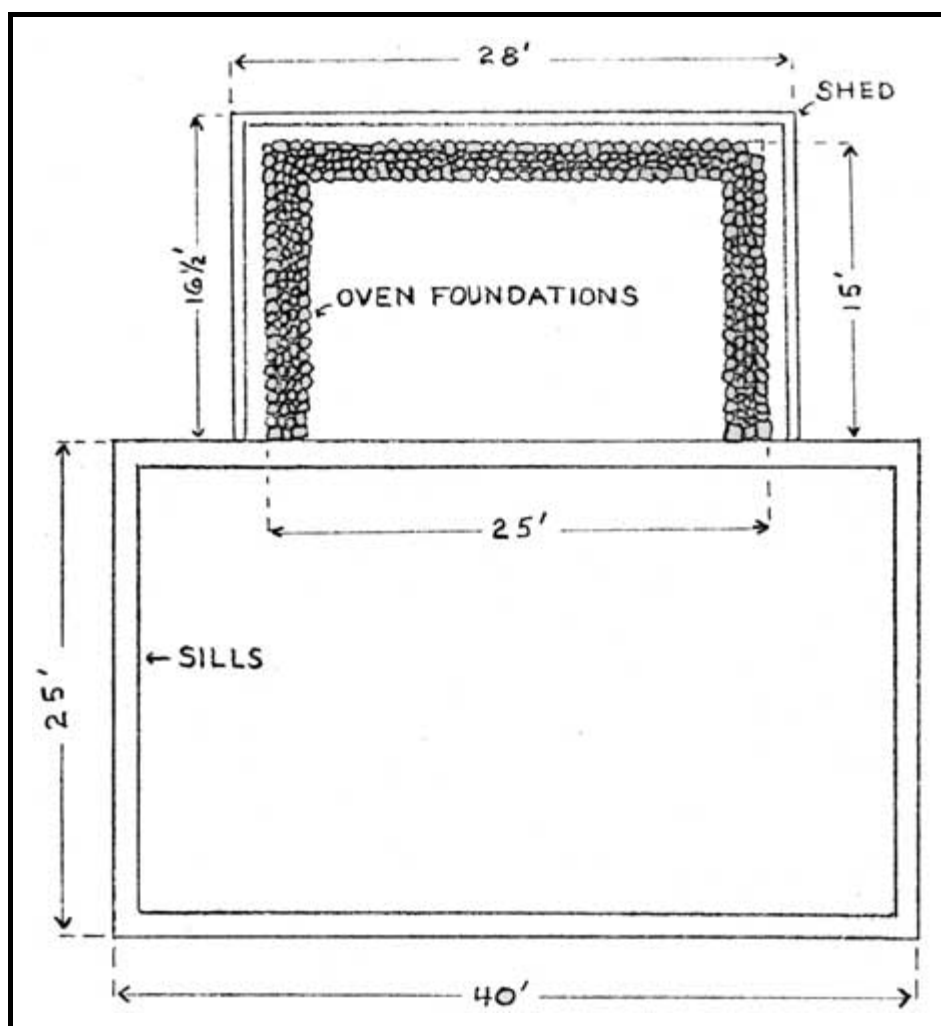


Figure 1. Foundation plan, 1844 Bakery. The dimensions of the shed are hypothetical, since no traces of it were found during archeological excavations. They have been enlarged slightly over those shown on the Vavasour plan of 1845 to permit the shed walls to stand clear of the ovens. Such a precautionary step against fire would seem logical.

But if the bakery is to be refurnished to the period of Outfit 1845, if the quarters of the baker or bakers are to be exhibited, and if it is assumed that Pétrain may have been in residence there during times of particularly heavy work, those quarters might reflect occupancy by a French Canadian engage; his part Indian, teen-age wife; and, for the brief span from June 10, 1845, to January 14, 1846, a new-born girl. Unlike most of his fellow laborers, Joseph Pétrain could write. [34] In view of the fact that in later life several years after he left the employ of the Hudson's Bay Company in late 1848 or early 1849, he served as probate judge of Clark County, Washington, it would appear appropriate to have reading materials among the articles in his quarters.

3. Bakery furnishings. The bakery inventories show variations from year to year, and the discrepancies are difficult to explain. If, for instance, blankets were necessary to the operation of the bakery, why do they appear in the lists for certain years but not for others? For certain years the lists are quite short, while for others they seem more detailed. Does this mean that there were actually more items in use at some times than at others or merely that certain clerks were more conscientious in their work than others? No sure answers can be given, but in view of the technology employed and the quantity of bakery goods produced the inclination of the present writer is toward accepting the longest and most detailed list, that for 1848, as the basic document in equipment planning.

In the following chapters of this report it will be brought out that certain items were virtually essential for the operation of a mid-19th century bakery. But, as was the case with the inventories of armament in the bastion, several such vital articles do not appear in any of the bakehouse inventories. For example, no mention is made of peels, the long wooden paddles used to put bread and biscuit into the ovens for baking and to take them out again. Nor are the various rakes and swabs used to clean the ovens listed.

It must be assumed that such items were present but that for some reason they were not inventoried. The most plausible explanation for the omissions seems to be that part of the bakery equipment consisted of "county-made articles" (those made locally and not imported) which were not always carried on the Company's books. Of course such items as tables and yeast tubs undoubtedly were also fabricated at Fort Vancouver, and why they should have been inventoried but not peels is not readily apparent. At any rate, when planning to refurnish the bakery, the extant inventories must be supplemented by lists of equipment derived from other sources.

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

Fort Vancouver

Historic Furnishings Report: Bakery



CHAPTER II:

COMPARATIVE DATA: THE BAKING PROCESS DURING THE 1840's

Until about the middle of the nineteenth century, and for long thereafter in many localities, the art of baking in Europe and in the European colonies had remained essentially unchanged since Roman times. Ovens of clay, stone, or brick were heated by burning wood in the baking chamber. The ashes were then raked out and the dough put in to bake. The single entrance to the oven was closed by a large stone or by a metal door.

Some of the Roman ovens had chimneys to improve the draft and carry off steam, but centuries were to pass before such flues became generally used. As time went by other improvements, such as dampers, were introduced; and such fuels as coal and peat were employed, sometimes to heat the baking chamber from below or from one side. But in England and in Canada, the two regions which must have provided the pattern for the Fort Vancouver bakery, the vast majority of ovens during the early 1840's continued to be heated by a fire in the baking chamber itself. [1]

A perusal of eighteenth and nineteenth century treatises on baking quickly convinces one that there were nearly as many formulas and methods for making bread as there were bakers. This condition was to be expected in an industry which, as one historian has noted, then "remained a craft and was still far from being a science." [2]

The diversity began with one of the very first steps in baking, the preparation of the yeast mixture or brew. Nearly every baker, noted another student of the art, "had secret recipes which he thought superior to those of other bakers." [3] During each succeeding step in the process the same individualism was evident, though in certain operations, such as the actual baking, there was less latitude than in others.

Indeed, in a trade beset by so many variables — the quality of the flour, weather conditions, water content of the fuel, strength of the yeast, and many others — a large degree of flexibility was a necessity. "In the light of these difficulties," states William G. Panschar, "it is a tribute to the skill and patience of the professional baker that he was able to bake as well as he did. The craft tradition remained strong because of these difficulties which only ability and skill could handle. One became a baker literally by growing up in the trade What, therefore may seem to have been daily trial and error was really the result of constant watchfulness on the part of an experienced craftsman." [4]

One other fact also becomes clear after examining descriptions of the bread-making process during the early 1800's. No quantitative measurements, whether for flour, water, salt, or fuel, have much relevancy unless the size of the oven for which these items were being prepared is also known. There would, for instance, have been no point in preparing all at once the final dough from an entire English sack of flour (280 lbs.) if the oven could bake only a few loaves at a time, since the dough would remain usable only for a certain period.

Although oven design will be considered in a later chapter of this report, it is well to bear in mind at this point that the ordinary commercial baker's oven in England during the period with which we are concerned was a vaulted chamber about 10 feet long, 8 feet wide, and 30 inches high at the top of the arch. [5] The standard United States Army wood-burning brick bake oven in 1864 was 12 feet long, 9 feet 4 inches wide, and 23 inches high. [6] In view of the foundation dimensions and the building practices of the time, each of the two baking chambers at Fort Vancouver probably was between 10-1/2 and 11-1/2 feet long and from 8-1/2 to 9-1/2 feet wide. There seems to be no information available as to the height, but 30 inches probably would be a reasonable estimate. It will be observed that the differences in cubic space between these three oven types were not great. Therefore bread recipes and fuel requirements for one probably could be applied without too much alteration to either of the others.

Heating the oven

The time for firing the oven each day, and the number of times it was fired during each 24 hours, varied according to the routine of the particular bakery. The type and quantity of the product were the primary determining factors, though as has been seen different bakers approached even similar problems in different ways. Often the oven was fired in the evening of the day before the products were to be baked. Another time much favored was about two o'clock in the morning. For English country bakeries five a. m. seems to have been the usual hour. [7]

Often a single firing would suffice for the day's output. Since the oven held a good degree of heat for several hours, a succession of products could be baked without refiring. First came the bread, then rolls and coffee cakes, and last sponge cakes, each requiring a diminishing amount of heat. If two batches of bread were to be baked, however, even in immediate succession, the oven had to be reheated. In large bakeries, and evidently in those producing biscuit and certain other products, the oven was often kept constantly hot during the baking process, which might last through the entire 24 hours. In such cases frequent refirings were necessary. [8]

The firing of a wood-heated furnace was an arduous and frequently unpleasant task. In Britain the fuel most often used was faggots — tied bundles of twigs and branches. They were bulky and unwieldy, and since they went into the oven whole, it was an "awful struggle" to push them through the small oven door (see Figure 2). [9]





Figure 2. Loading wood faggots into an English country bake oven in accordance with a practice followed at least since Roman times. As late as 1957 a few of the old faggot ovens were still in use. (From Ronald Sheppard and Edward Newton, *The Story of Bread* [London, 1957], 110.)

Whether this type of fuel was used at Fort Vancouver is not known. Probably it was not, since pine, spruce, or fir wood seems to have been preferred in Canada and the United States. American army specifications called for something called "Baker's Pine," but it was admitted that "Spruce will answer." This wood was split into fine sticks which usually were four feet long. [10]

Military bakers, in the United States at least, evidently were expected to prepare their own wood, since axes, hatchets, and saws were specified items of equipment for every bakery. [11] The Fort Vancouver bakery inventories included axes and saws, so the same situation probably prevailed on the Columbia under the Hudson's Bay Company.

The quantities of wood required were not insignificant. According to United States Army estimates, it took 3/16 of a cord (24 cubic feet of wood) to heat a cold single oven to bread-baking temperature (about 550° to 580°). Once the oven was heated, however, it could be brought back to baking temperature 24 hours later for only about 3/32 of a cord (12 cubic feet). In such case, if two batches were baked one right after the other, about 16 cubic feet would be required for both. But if 12 hours separated the batches, "almost" 3/32 cord would be required for each heating. If the ovens were heated more than twice a day, about 1/32 of a cord would be needed for each heating. [12]

Regardless of whether faggots or sticks were used, it was customary to dry the fuel before lighting it. With faggots, this was ordinarily accomplished by placing several of them in the warm oven overnight or at least for a number of hours. [13] No record has yet been found of wood sticks being treated in this manner, but the arch under the oven, when there was one, was recommended by military manuals as "a convenient space for drying wood." [14]

It took between an hour and nearly two hours to bring the oven to cooking heat. [15] Although the temperatures for various types of breads were sometimes given in degrees in baking manuals, practically no bakers of the time used thermometers. Instead, the baker

looked inside the oven. If there was soot on the bricks he knew the temperature was too low. If the bricks glowed and had a white appearance, he knew it was "just right." When a more precise test was needed, many bakers threw a few pinches of flour on the oven hearth. If, after a few seconds, the flour turned a light brown or looked "slightly scorched," the temperature was correct. [16]

There is a certain amount of evidence concerning the practices of the Hudson's Bay Company's bakers on the Columbia in this respect. It is said that Alexander Jondrau, the baker at Fort Colville, tested his oven by thrusting in a piece of paper. If it turned brown he would put in his bread. [17]

However the oven was tested, when the right temperature had been reached, the ashes were drawn to the front by a long rake or rooker and placed in buckets for disposal outdoors. Then a hoe, much like a garden hoe in shape, was employed to scrape out such ashes and dust as had escaped the rooker. Next a swab, sometimes called a "scuffle," was dampened in a pail of water and "swung round and round" the oven until the bottom or hearth was clean. [18]

The swabbing reduced the oven temperature to about the correct heat for baking, but sometimes it was considered still too hot. The French inhabitants of Upper Canada often tested the temperature at this point by holding one of their hands inside the oven door. Baking could begin when they could keep the hand in until they could count to twenty. [19]

The entire business of firing the oven was a messy operation. Generally a good deal of smoke escaped into the bakery, and the men had to work in a "choking, eye-smarting" atmosphere. The ashes were hot and dusty. "Sometimes," recalled one old English baker, "the whirling 'scuffle' would fetch out a hot coal which would go down inside the man's shirt. Then there were fireworks and language." [20]

Most bakers, when the oven was clean, began to set in the dough to be baked almost at once. [21] But other bakers preferred to shut the door and damper and let the heat spread throughout the oven for about two hours. Not until this "equalization period" was ended did they consider the oven ready for baking. As has been stated, there were many variations in the baking process. [22]

Making bread

To describe the bread-making process as it was conducted during the early nineteenth century is not simple. The many different types of bread which could be produced and the individualistic practices of the bakers have resulted in a bewildering legacy of recipes and descriptions from which it is difficult to sift the common elements. Further, most of the discussions are so technical, so filled with data on the chemical and physical properties of flour, yeast, and other ingredients, that the average reader tends to lose the main process to say nothing of his interest.

Fortunately, for the present purposes it is not necessary to go into the variations and technical details. All that is required is to describe a typical baking routine in sufficient detail to give a picture of the equipment employed and how it was used.

Yet even this seemingly easy task is approached with hesitation. When one formula for the process known as "setting the sponge" (to be explained below) calls for all the flour to be baked to be poured at once into the mixing trough with only liquid being added during the later stages while another recipe directs the baker to put only one-third of the flour in at the start and the remaining two-thirds some three hours later, it is difficult to find a common

ground. The time allowed for "setting the sponge" could be as short as four hours or as long as twelve hours. [23] With the dangers of generalization well in mind, therefore, the following picture of the working day in an "average" English country bakery is presented for what it is worth.

Stock yeast. Before the baking process could begin, the baker had to have on hand a basic ingredient known as "stock yeast." In the days before compressed yeast, each baker had to make his own yeast, for which he usually had a personal secret recipe. The starter or "fermentation" for stock yeast was generally made from hops, flour, and malt beaten into a stiff batter and allowed to sit covered for 24 hours. This fermentation was then used as the key ingredient in "stock yeast," also generally made from hop water, flour, and malt allowed to stand for 24 hours.

Once a stock yeast was made, a portion was saved out each day and used for starting the next day's batch in place of the fermentation. Some bakers threw out their old stock yeast entirely once a month, thoroughly cleaned all the utensils used in making it, and began afresh with a new fermentation. Other bakers continued to renew from the old stock yeast for as long as a year. [24]

Ferment yeast. The stock yeast, in turn, was the basic ingredient in what was termed the "ferment yeast." This article was prepared by boiling from five to eight pounds of potatoes for each sack of flour to be baked. When soft the potatoes were either peeled or the skins were "strained out" by forcing the mass through a cullender or sieve. The potatoes were then mashed in the "seasoning tub." While the potatoes were still very hot from about 3/4 pail to six gallons of water, two or three pounds of flour, and from one quart to several quarts of stock yeast were added. The whole was well stirred with the hands into a smooth, thin paste and then left to rest for between four and twelve hours before use depending on the formula favored by the baker. [25]

Setting the sponge. Once the ferment yeast was ready for use the actual bread-making process could begin. Meanwhile the baker had heated a large quantity of water, generally by placing a cauldron or kettle in the oven. He also had emptied the amount of flour to be used into one end of a wooden kneading trough and had shoveled it through a brass wire sieve into the other end. In the process he usually became well powdered with flour dust. [26]

When all was ready, a portion of the flour to be used in baking, from one-third to nearly the entire amount depending on the formula used, was penned up in one end of the trough by a removable partition rather like a sluice gate. Then the ferment yeast, to the extent of up to about seven gallons for each sack of flour to be employed in the final product, was diluted with about two gallons of warm water (70° to 100°, with 84° Fahrenheit preferred) and strained through a "seasoning sieve" into a hole made in the penned up flour. In very hot weather cool water had to be used, since temperature was critical in the dough-making process.

The flour and diluted stock yeast were next thoroughly mixed to form a moderately stiff dough called the "sponge." This process was done by hand and required strength. Often the baker climbed into the trough for the task, and in certain countries the feet were employed. When thoroughly mixed, the dough was covered with sacks or flannel and left to stand and ferment for about three hours. This entire process was known as "setting the sponge."

After the "sponge" had finished rising and started to fall it was, according to some formulas, ready for making dough. Other recipes called for the stirring in of more warm water or "liquor" (water mixed with certain ingredients) at this time and letting the "sponge" rise one or more additional times, adding more "liquor" with each stirring. Depending upon the

amount of water added for each of these "sponges" in relation to the whole quantity used in the dough, they were called "quarter," "half," or "whole" sponges. [27]

Making dough. When the baker decided the fermentation process had proceeded far enough — failure to stop it after the second or third dropping of the sponge resulted in sour bread — he took the step known as "breaking the sponge," that is he added about six gallons of water in which from 2-1/2 to 3-3/4 pounds of salt had been dissolved. After the water and sponge were well mixed he poured in the remaining portion of the sack of flour.

Then followed another long period of kneading to blend together the fermented and unfermented particles. When the baker could strike the dough with his hand or thrust his hand into the dough and then pull it away without any dough adhering to it, he knew that the kneading had been sufficient.

The dough was then allowed to rest for several hours, sometimes being given a second kneading so that the carbon dioxide gas caused by fermentation would be well distributed throughout the entire mass. During this period the oven was heated and made ready for baking.

Scaling off. When the dough was ready, the baker took it out of the trough with his arms and put it on top of the lid, or on the lid of another trough, or on a table. The dough was then cut with a dough cutter into pieces which were weighed or "scaled off." In England 4 lbs. 15 oz. was allotted for each quartern loaf. After the weight was adjusted, each piece was "worked up" and placed in order on a table until all had been weighed. Usually from 80 to 82-1/2 quartern loaves could be made from one 280 lb. sack of flour. Sometimes the bread was allowed to rest and rise again at this point.

Then each piece of dough was "moulded" — a "peculiar" operation learned only by practice. The mass of bread intended for each loaf was separated into two equal portions. These were then kneaded either long or round, and one was placed in a hollow made in the other, the union being completed "by a turn of the knuckles on the centre of the upper piece." [28] The moulding was performed in the order in which the loaves had been scaled off.

Setting the batch. After each loaf was moulded it was passed to a man stationed at the oven door. He placed it on a long-handled shovel called a quartern peel and introduced it into the hot oven, where by a "dextrous twist" it was deposited on the tile or brick floor. In New England during the 18th century meal was sprinkled on the peel before the loaves were placed on it, but if this practice was followed in England and Canada the present writer has not yet seen mention of the fact. [29] The baker and his assistant continued moulding and delivering until the entire batch was set in, generally in close-packed rows. The oven door was then closed, and the baking began.

The heat of the oven was an important factor in the outcome of the baking process. If the oven was too hot the bread would be scorched on the outside and underbaked in the center.

After from one to three hours, depending on the type of bread and the process used, the bread would be done. The "drawing peel" was inserted under a part of the batch, which was "obliquely elevated," separating three or four loaves from their adhesion to the others. These were withdrawn and placed on a table or shelves. The remainder were then separated and removed in the same manner. It was the practice of some bakers to place the freshly baked loaves with their bottoms upward to prevent them from splitting. They were covered with flannel until wanted for delivery or sale. [30]

Additional tasks. After the loaves were safely set on the shelves the baker's work was not ended. Preparations for the evening's or the next day's routine (depending on the formula

followed) had to be made. Potatoes for the next ferment yeast were placed in the oven to boil. When they were cooled the ferment for the next batch was mixed, since under many recipes 24 hours elapsed from the preparation of the ferment yeast to the time when the bread was taken from the oven. Wood had to be carried in to dry, and flour was brought from storage, put in the trough, and sifted. In some bakeries a "long" dough which could ferment up to 12 hours was prepared in the evening to be ready for the final steps of bread making early the next morning. This procedure permitted the baker to get a night's sleep. In other shops the fermentation period was as short as four hours, necessitating more or less continuous operation or supervision. [31]



Figure 3. A Medieval bakery. The baking process had changed so little between the Middle Ages and the early 1800's that this picture quite well illustrates the operation of a small commercial bakery during the latter period. One baker kneads dough in a wooden trough, another moulds the loaves, while the third places the bread in the oven. (From Sheppard and Newton, *The Story of Bread*, 40.)

There exists a slight amount of evidence as to Hudson's, Bay Company practices in these additional tasks, although not at Fort Vancouver. One of the last bakers at Lower Fort Garry was Peter Spence, and three of his children years later told an interviewer of their life at the post during the 1860's. A son remembered carrying as many as 16 sacks of flour in one day from the store (warehouse) to the bakery. Since he could not have been much more than 12 years old at that time, the sacks at Fort Garry must have been considerably lighter than the standard English 280-pound bag! [32]

Making biscuit

The manufacture of hard bread, also known as ship bread, sea biscuit, pilot bread, and, later, hard-tack, was in many respects a simpler operation than the baking of bread, since no leaven (fermented dough or yeast) was involved under the most commonly used recipes. In essence, the sea biscuit was a mixture of flour and water baked crisp in an oven. Some formulas provided for the addition of a little salt, which improved flavor but increased the likelihood of moisture absorption.

As made in colonial America, biscuit was a "large, round, dry, crisp wafer." [33] Another writer described it as "a large, round, clumsy, crisp affair." [34] The ideal sea biscuit was light yellow in color. When struck it gave a "clear almost ringing sound." Although it would "readily and thoroughly soften in the mouth," it was supposed to float and hold its shape if immersed in water. [35] Above all, it was designed to last and provide nourishment for many months or even years if properly stored.

A second type of biscuit came to be made in America at an undetermined date but well before the 1840's. It was known as a cold water cracker. It was unleavened and much like the usual ship biscuit but smaller in size, more compact in texture, and of greater hardness. [36] Perhaps it corresponded to the "White Biscuit" which, as we have seen, was produced in England by the early 1840's.

The process of making unleavened biscuit was an ancient one, since this type of bread is mentioned in Biblical records, and traces have been found in the Neolithic lake dwellings of Switzerland, although when the familiar pilot bread in its present form began to be made is not known. At any rate, the laborious method of forming each biscuit separately by hand and placing it individually in the oven appears to have undergone little change over the centuries. Not until about 1833 was some degree of mechanization introduced into the business. By about 1840 hand operated mixers, rolling machines to thin out the dough, and a stamp which would cut the dough into a number of biscuits at once had considerably speeded the process, as did oven racks which permitted several tiers of crackers to be baked at once. [37] By 1851 steam and horse power were being employed to drive fairly sophisticated and in some cases almost automated machinery. The industrial age had come to the biscuit industry. [38]

One result of the mechanization was a change in the shape of the biscuit. By 1851 the long-familiar round pilot bread provided for the Royal Navy had been replaced by a hexagonal biscuit. This shape could be stamped out from sheets of dough with less waste than the old one. Hexagonal crackers also could be packed more compactly. [39] No picture of the old British round sea biscuit has yet been found by the present writer, but a clear photograph of one of the original hexagonal biscuits from the 1850's will be found in [Plate I](#). By the 1890's the hard-tack made for the United States Army came in two shapes, round and square. [40]

An examination of the inventories and requisitions for Fort Vancouver has thus far produced no evidence that any of the new mechanical inventions had been acquired for the bakery by 1845-1846. It can be assumed, therefore, that the time-honored process of making biscuit by

hand was still in use on the banks of the Columbia during this period.

Available descriptions of the biscuit-making process before the introduction of machinery are both scarce and spare, at least as far as the present writer has been able to pursue the subject. However, except for the mechanical devices involved, the procedures followed after the 1840's do not appear to have been materially different from those used in the days of hand work. In the following account the steps in the process and the quantities of the ingredients involved are derived from instructions for preparing United States Army hardtack in the 1890's. The descriptions of the procedures in each step, however, are based upon several isolated and very brief accounts of the pre-machine process.

Mixing. A barrel of flour (196 pounds) was placed in the mixing trough. Then eight or nine gallons of water (depending on how much the flour would absorb) were added gradually, being thoroughly mixed with the flour. This mixing continued until the dough was entirely "clear," evidently of lumps, but bakers were warned against too much kneading lest the biscuits not be as light, flaky, and brittle as they should be.

Breaking or rolling. After mixing, the dough was ready for immediate use. It was broken up into pieces which were weighed and shaped into sheets the size of the finished biscuit. The ideal thickness of the dough at this stage was 3/8 inch. Such a piece of dough would "spring" during or after baking to a thickness of about 1/2 inch and would produce a biscuit which would be "not too hard to masticate" but still transport well.

Stamping. Each piece of dough was then stamped in pairs by a biscuit stamp which impressed it with any necessary markings and at the same time punched a number of holes through each cracker. These perforations prevented puffing during baking.

Baking. It required two men to charge the oven. One picked up the individual stamped pieces of dough and, in some bakeries at least, tossed them with "unerring accuracy" for several feet to the peel held by the second baker. It is reported that in New England this peel was a "long-handled, sheet-iron shovel" instead of the wooden peel favored in Europe and Canada. Each biscuit was transferred individually by the peel to a place on the oven floor, which often was of tile.

The temperature for baking biscuits was lower than that for bread. About 450° was considered suitable. The time of baking was only about 25 minutes (though this figure was for mechanized reel ovens). One 196-pound barrel of flour produced about 180 pounds of hard bread.

Drying. In some bakeries, particularly in England, it was customary to transfer the biscuits, after they had been withdrawn one by one from the oven, to a warm room or other place over the ovens where they could be dried out for two or three days. Hard bread so treated tended to resist mold better than biscuit packed immediately after baking. [41]

Packing. At the Hudson's Bay Company's Lower Fort Garry, on Red River in the present Manitoba, the biscuit, after it was cold, was placed in bags and carried to one of the stores or warehouses, where it was "put up in cargoes for shipping." [42] As has been seen, at Fort Vancouver the biscuit was packed in barrels and charged for by the hundredweight. Whether the final packing was conducted at the bakery or at one of the stores is not apparent.

The packing operation at commercial bakeries of the period was conducted by hand. To prevent breakage during transport it was important that the biscuits be closely packed. During the 1840's the hard bread for the United States Army was ordinarily put up in barrels, but when tropical conditions were encountered during the Mexican War there were many complaints that the biscuit was unfit for use due to faulty containers and insects.

Quartermasters in the field urged that all containers be perfectly tight, well-coopered barrels with painted heads which, if possible, had been used previously for holding spirits. [43] In England the casks were sometimes lined with tin. Other packers favored fumigating the barrels with sulphur after they had been filled in order to discourage insects. [44]

French sea biscuit

It is highly probable that the biscuit-making method employed at Fort Vancouver was very similar to the British and American process described above. Yet, the bakers on the Columbia were French Canadians, and it is possible that they employed a technique reportedly in use in France at least as early as 1802 and probably for decades or even centuries before that. This process differed from the Anglo-Saxon method chiefly in the addition of leaven (fermented dough) to the ingredients.

The French method of baking "sea-biscuits" was described in an 1802 encyclopaedia as follows:

In the preparation of biscuit, a proportion of ten pounds of leaven (rather more stale than that commonly used for bread), is diluted in warm water, with one hundred pounds of flour, which is kneaded; but the water should be added by small portions, to prevent the necessity of adding more flour: when the dough can no longer be worked by the hand, it is pressed with the feet till it is perfectly smooth, glutinous and compact.

The kneading being finished, the dough is worked up in parts: at first it is formed into rolls, which again pass through the hands of the baker; this is called rubbing. When the weight of each piece is determined, it is made round, flattened with a rolling pin, and then placed on a table or board exposed to the fresh air, in order to prevent too quick fermentation.

Care is taken that the oven be less heated for the baking of biscuit than bread; and as soon as the last cake is formed, that which has been made first, is pierced with several holes, with the point of an iron, which at once flattens it, and gives vent to evaporation: it is then placed in the oven. The biscuits are kept there about two hours, and when drawn out, they are packed with great caution in boxes, lest they should break. Each box commonly contains either a half, or a whole quintal; and, when filled, is placed in a close, warm room, with which the heat of the oven has a communication. The biscuit here parts with its superabundant moisture, and undergoes what is called a sweating. [45]

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

Fort Vancouver

Historic Furnishings Report: Bakery



CHAPTER III:

COMPARATIVE DATA: OVENS

The available specific data show that the Fort Vancouver bakery of 1844 contained two brick ovens, each having a chimney at its west end. Archeological evidence proves that they were placed side by side on cobblestone foundations 1.6 feet to 2.0 feet wide enclosing a space with outside dimensions of about 25.0 feet north-south and 15.0 feet east-west. From information found in inventories it is almost certain that tiles were employed in the oven structures in addition to brick, very probably at least on the oven floors since, as has been seen in the previous chapter, tiles were often used for this purpose in ovens in which biscuits were baked. [1]

But most other construction details remain unknown. Among them are the thickness of the oven walls, the interior shape and dimensions of each oven, the height of the oven floors above the ground, the height of the oven arches, whether the chimney entrances were within or without the oven doors, whether there were arches under the ovens, and how far apart the ovens were. In a reconstruction such features will have to be designed upon the basis of the general practice of the time as determined by available comparative data.

For assistance in determining what the general practice was, if indeed there was one, there are presented below descriptions of ovens believed to be of about the same size, type, and function as those at Fort Vancouver. Since the basic design of wood-burning ovens did not change greatly during the eighteenth and nineteenth centuries the dates of the examples are not of major importance for our purposes. On the other hand, the cultural heritages reflected in the designs do appear significant to a certain degree.

This conclusion brings up a difficult question. Did the ovens at Fort Vancouver reflect the national backgrounds of the predominantly Scottish officers at the post or of the French Canadians who operated and probably actually constructed the bakery? No decision seems possible, but the present writer is inclined to feel that the officers did the designing, perhaps on the basis of some English precedent, plan, or manual as yet unidentified.

Ovens at Lower Fort Garry, Manitoba

In the Historic Structures Report Historical Data Fort Vancouver, vol. I, pp. 53-54, it was suggested that the two existing sets of bake ovens (three bakery structures survive, but only two have ovens) at the Hudson's Bay Company's Lower Fort Garry on Red River might serve as models to a certain extent for several features of the reconstructed Fort Vancouver ovens. That suggestion still seems to have a degree of validity, but caution must be used in accepting the theory that the Fort Garry ovens faithfully reflect oven technology at Company posts during the mid-1800's.

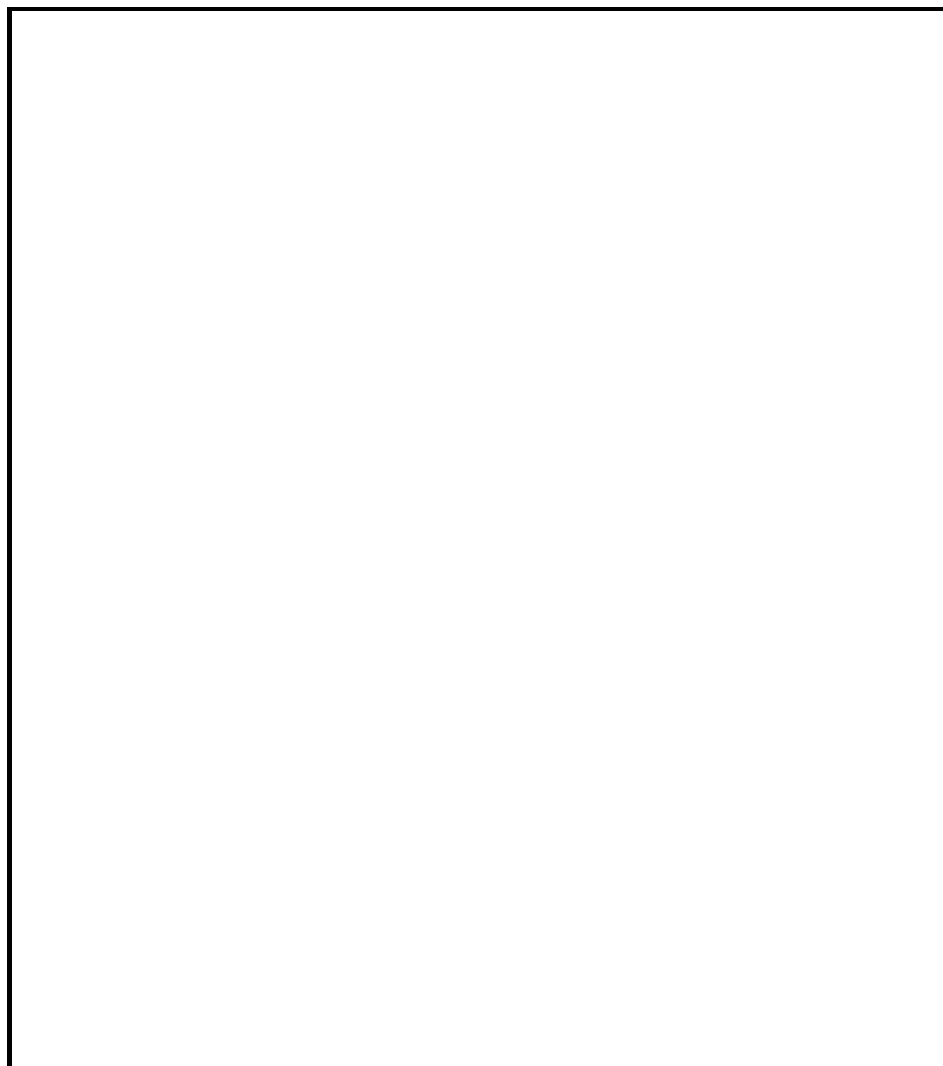
Since the Historic Structures Report was written, it has been learned that the ovens which must have most closely resembled the ones at Fort Vancouver, those in the Northwest

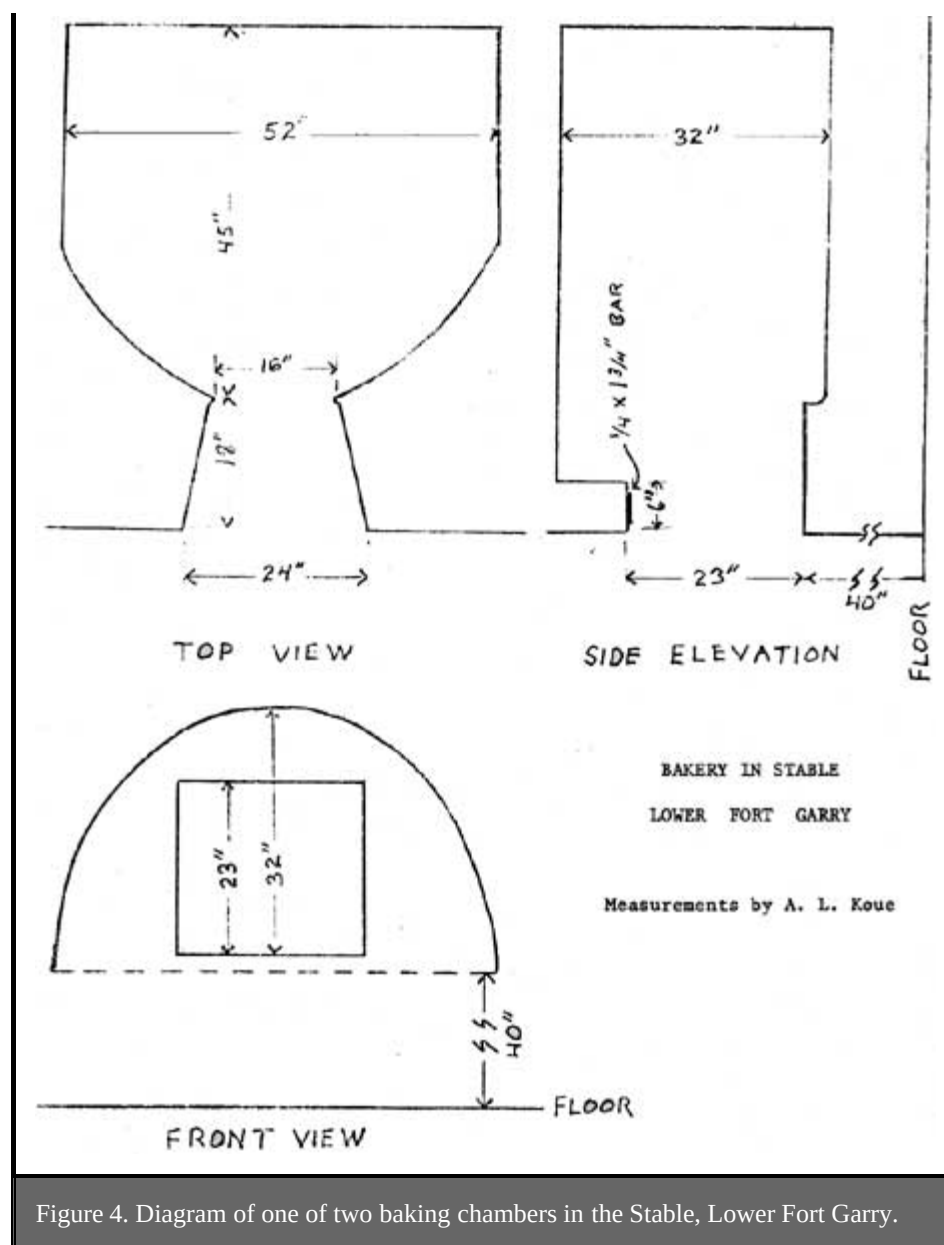
Bastion, probably originally dated from the period 1846-1848 rather than 1831-1847 as heretofore understood. This fact would not of itself present a serious problem, but it is now apparent that every trace of the original 1846-1848 ovens may have been removed from the bastion in 1911. [2]

The present ovens in the Northwest Bastion, therefore, are reconstructions. The evidence used as the basis for the rebuilding is not clear to the present writer, but the extant ovens so well correspond with general descriptions of bake ovens of the period that apparently a serious effort was made to achieve accuracy in restoration. [3]

At any rate, the information on the twin ovens in the Northwest Bastion is repeated here for what it is worth. This oven complex was considerably smaller than that at Fort Vancouver, the outside dimensions of the foundations being about 14'9" x 8'8". Each of the two baking chambers was rectangular in shape, 5' long and 4'3" wide, with a vaulted ceiling about 3'3" high at the top of the arch.

The ovens were built largely of stone, though some brick was used about the oven entries. The ovens were vaulted on the outside as well as inside, being placed side by side with a common wall about three feet thick between them. The side and rear oven walls were somewhat more than a foot thick, while the common front wall was about 2'8" through. The floors (or hearths as they were termed) of the baking chambers were level with the bottoms of the doors. A flue led in a slanting direction from the top front of each oven to a common chimney at the front end of the ovens. Air spaces at the sides and rear of the joined ovens separated the heated elements from the walls of the bakery.





The construction of these twin ovens is illustrated by the photographs in Plates [III](#) and [IV](#). Further details are given in [Plate V](#), a drawing based on measurements made during a visit to Fort Garry by Architect A. L. Koue and Historian J. A. Hussey on September 20, 1967.

There is a second bakery at Lower Fort Garry, located in a building designated as the Men's House or Stable. Although this complex of two separate ovens appears to date from a later period of military occupancy, it has features which may be applicable at Fort Vancouver. In particular, the height of the oven hearths above the bakery floor, 40 inches, would seem more suitable for large-scale bakery operations than the back-breaking 24 inches of the Northwest Bastion ovens. The dimensions and general design of one of these ovens are shown in Figure 4 on the following page. What apparently is a photograph of these ovens before restoration is shown in Plate [VI](#).

An "ordinary" British baker's oven

According to one authority, the "ordinary" baker's oven in Britain was a vaulted chamber, about 10 feet long, 8 feet wide, and 30 inches high at the top of the arch. [[4](#)] A perusal of a

number of sources concerning early baking in England confirms this very general observation and adds the further information that the baking chamber was sometimes oval in shape and sometimes rectangular, one not being obviously favored more than the other.

But when one comes across some of the very few available detailed descriptions of British ovens, it is difficult to find a reflection of this general picture in the specifications given. Perhaps the reason lies in the fact that the persons who prepared these descriptions were more interested in advocating new or "improved" models of ovens than in depicting the more common, antiquated types.

Such may have been the case with John Claudius Loudon, an industrious compiler of handbooks on agriculture and architecture. In his book Cottage, Farm, and Villa Architecture, published in 1844, he presented a plan for a "common country oven," which he described as "a rude kind of oven adapted for new countries, where it is frequently necessary to use for fuel green boughs."

In his introductory remarks before describing this oven, Loudon stated, "The ordinary size of Bakers' ovens is from eight to twelve feet square The height of a baker's oven is about eighteen inches in the centre, in ovens of the smallest size, and two feet in those which are larger. "The lower and flatter the arch is, he continued, "the more easily is the oven heated, and the more equally does it give out its heat. The sides of the oven need never be higher than a foot . . . and there can be no reason why the roof of the oven should be higher in the centre than at the sides, except that it is impossible to build the soffit of an arch perfectly flat. The floor of the oven is laid with tile, and the arch is formed of fire-brick, fire-stone, or trap, set in fire-clay, or in loam mixed with powdered brick. The whole is surrounded by a large mass of common brickwork, to retain the heat." [5]

The plan for Loudon's "Oven for Green Wood" is reproduced in Figure 5. The description of this oven as given by Loudon is as follows:

Oven for Green Wood. Fig. 1367 [see Figure 5] is a ground plan of a common country oven, in which a is the floor of the oven; b, the sill of the door; and c c, holes in the floor, communicating with a tunnel below, for the purpose of admitting air to urge combustion, when green wood is burned. Fig. 1368 is a longitudinal section on the line A B, in which d is one of the openings for the introduction of fresh air to the green fuel, but which is closed by a fire-brick, or by building up the entrance to the funnel, b [sic, h?], when dry fuel is used; e is a flue from the highest part of the arch of the oven, for conveying away the smoke to the chimney, g, when green fuel is used, but which is closed by a stopper at i, when the oven is heated by dry fuel; f is the door to the oven, and g the chimney. When dry fuel is used, the orifices at d and i are closed, and the fuel, being introduced at f, is ignited there, and pushed forward to the centre of the oven, where it burns till consumed, or till the oven is sufficiently heated; the smoke passing out by the upper part of f, and ascending the chimney, g. When sufficient heat has been obtained, which is between 250° and 300°, and which the baker knows by experience, never using a thermometer, the floor of the oven is cleaned out, and the bread introduced; the door, f, and the stopper, i, are then closed for a short period; after which a very small opening is made, by loosening the stopper, i, to admit the escape of the vapour exhaled from the bread. This vapour, or whatever proceeds from the door, f, when it is opened either to examine or to take out the bread, ascends by the open chimney, g. Fig. 1365 is a transvers section on the line C D; and fig. 1366 is a front elevation, showing the door to the oven, k, and the opening to the tunnel below, l. Ovens of this description are in general use in France; but in those of Paris, where dry wood is always used,

the funnels, d and e, are seldom made use of, but to cool the oven, or to admit of the escape of the vapour from the bread. It may be observed, also, that, in some of the ovens of Paris, the fuel, instead of being burned on the general surface of the hearth, is consumed in iron gratings or baskets, placed over the openings, c c, whic: is found a more rapid and economical mode of heating, than that of making a fire on the floor of the oven. [6]

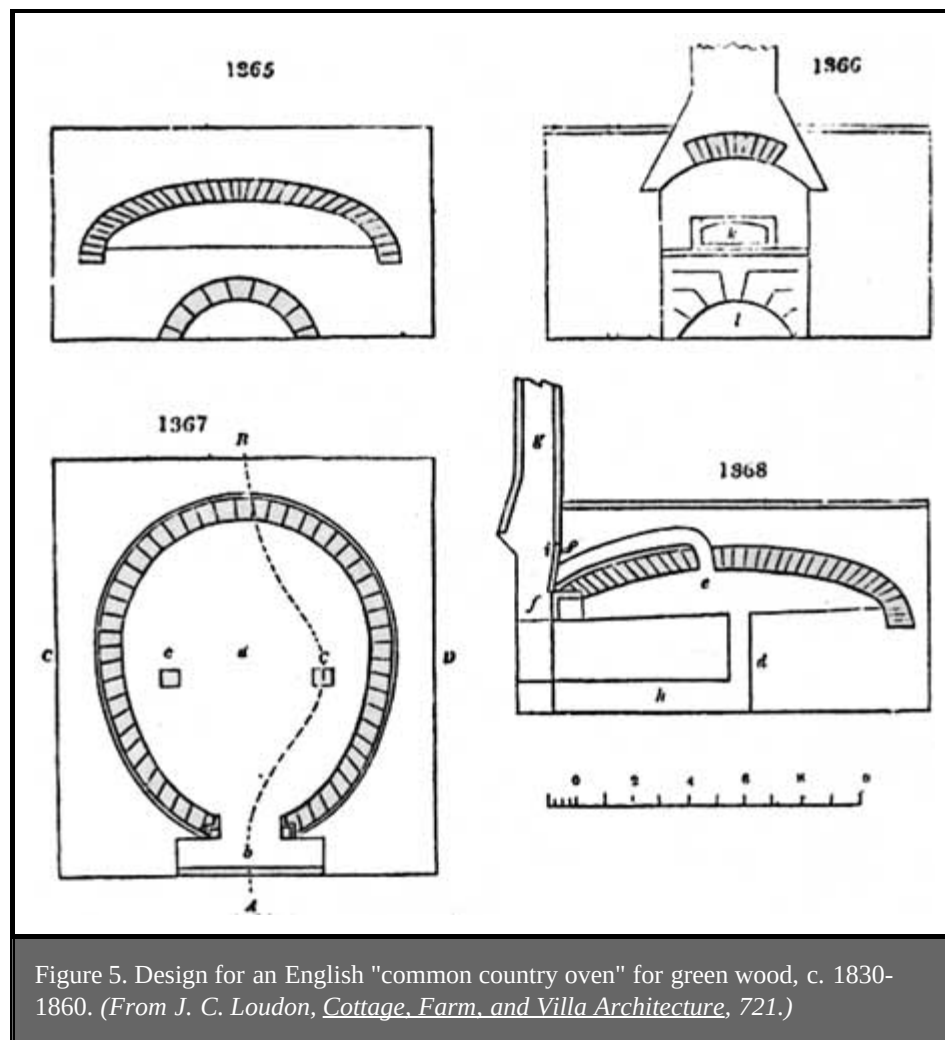


Figure 5. Design for an English "common country oven" for green wood, c. 1830-1860. (From J. C. Loudon, *Cottage, Farm, and Villa Architecture*, 721.)

Several features of Loudon's oven appear to require comment. First, it will be noted that the main flue or chimney is situated in front of the oven door. Second, flue e—i and air holes c c (d) were to be closed off when dry fuel was burned; therefore these orifices were undoubtedly absent in many older ovens for which the fuel was routinely dried before use. [7] Third, the arch or "tunnel" (l) under the oven serves in Loudon's example as a part of the draft system; but as shall be seen by other plans presented in this chapter, the arch quite frequently had no function other than to strengthen the oven structure, save materials, and serve as a place for drying fuel. Many ovens had no such arches at all.

A French bake oven, c. 1760

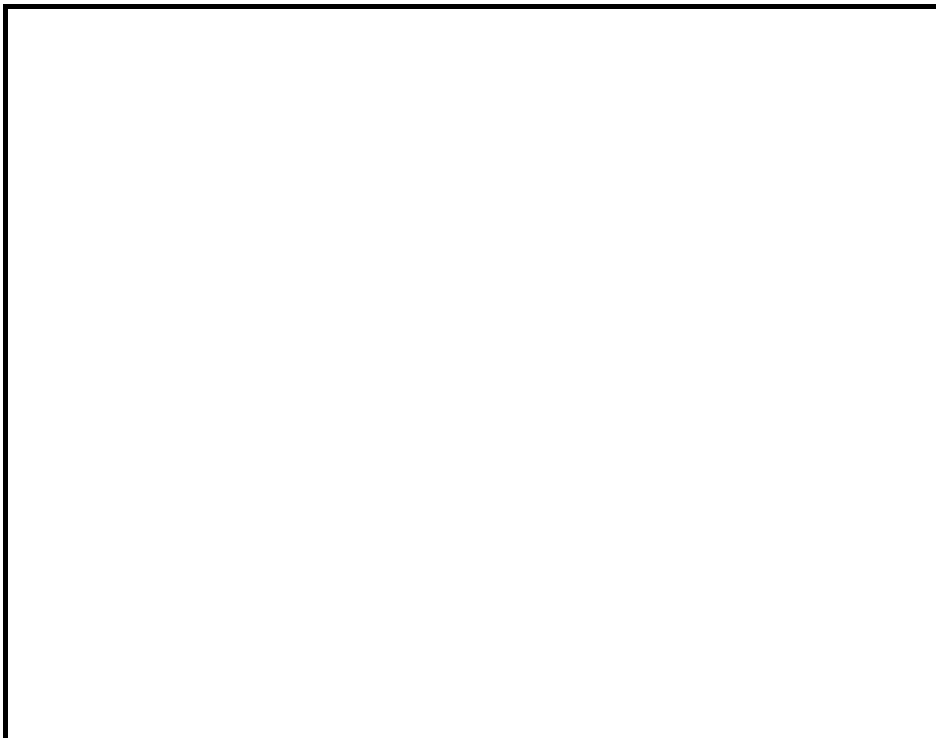
Denis Diderot's great *Encyclopédie* contains a description of commercial baking as it was conducted in France about the middle of the eighteenth century. One of the magnificent plates gives a plan of a typical French bake oven of that period. [8] It is reproduced in Figure 7.





Figure 6. An English bake oven, c. 1847. This apparently somewhat generalized drawing seems to indicate that the chimney opening in this oven was inside the oven door. (From an unidentified clipping in a scrapbook at the Museum of English Rural Life, University of Reading, England, through the courtesy of Mr. J. A. Creasey, Assistant Keeper.)

It will be noted that the chimney in this French oven is placed outside the oven door and that there is no flue connecting the baking chamber and the chimney. Also, there are no air holes-leading from the arch under the oven to the baking chamber.



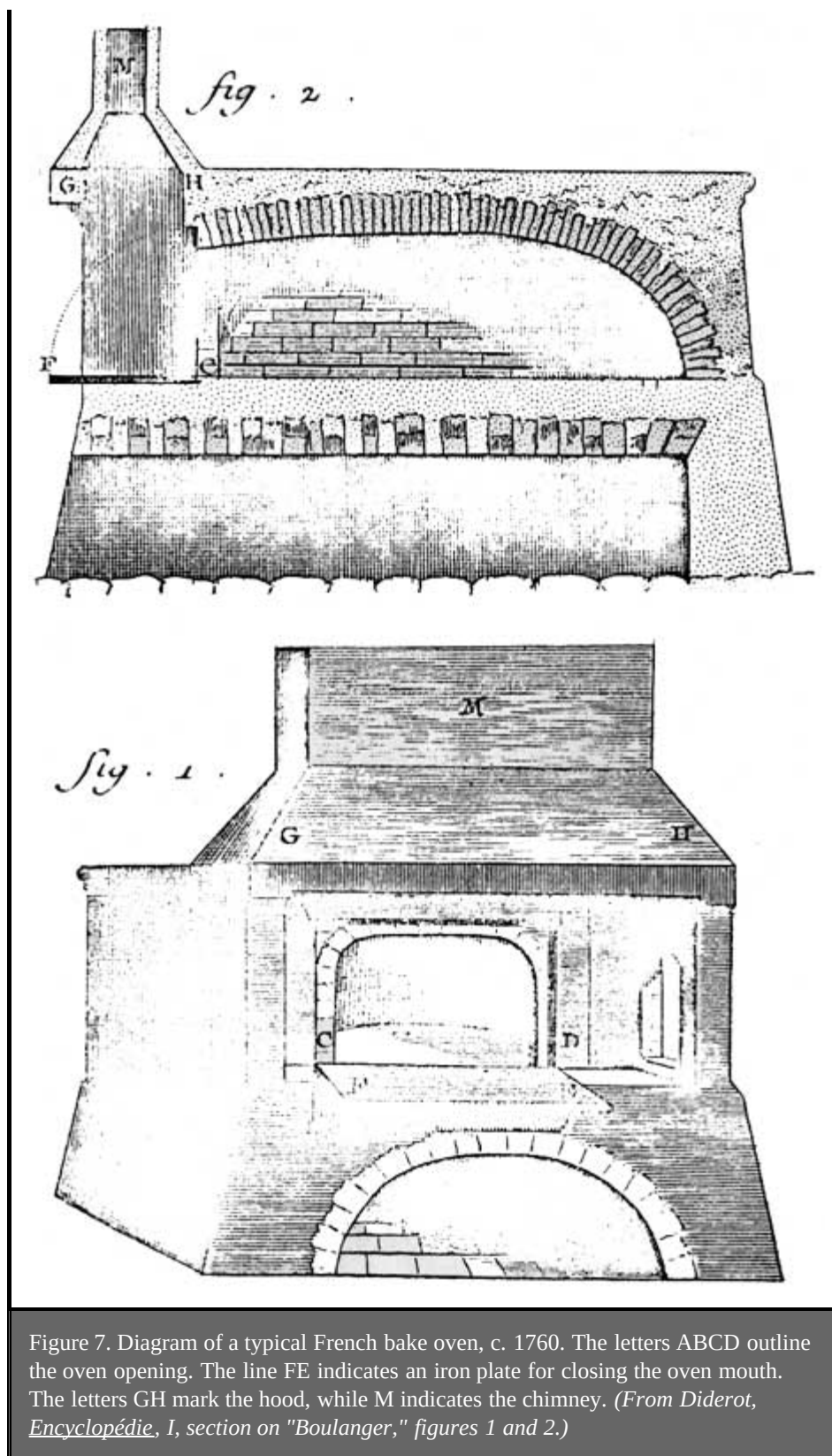
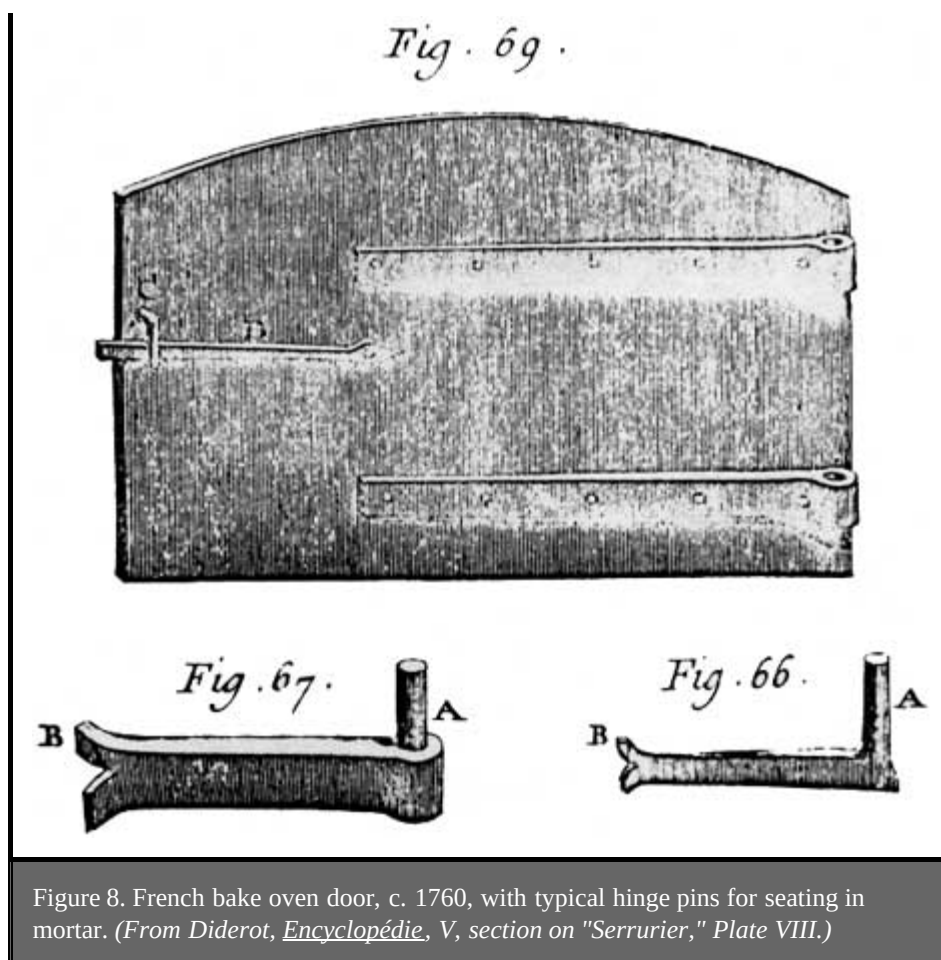


Figure 7. Diagram of a typical French bake oven, c. 1760. The letters ABCD outline the oven opening. The line FE indicates an iron plate for closing the oven mouth. The letters GH mark the hood, while M indicates the chimney. (From Diderot, *Encyclopédie*, I, section on "Boulangier," figures 1 and 2.)

The oven door shown in the diagram is a sheet-iron plate which drops down. Other French ovens, however, had side-opening iron doors quite similar to those generally found on British ovens. Such a door, also pictured in Diderot, is shown, with typical hinge pins, in Figure 8.





Wood-burning oven recommended by the Subsistence Department.

U. S. Army, 1864

A manual, Bread and Bread Making, published in Washington, D. C., in 1864 for the use of army subsistence officers, contained plans and specifications for a wood-burning bake oven which was said to "have been advantageously used" for baking bread by the Subsistence Department. By 1882, when the same plan appeared in another handbook issued by the Commissary General of Subsistence, this type of oven was described as an "old style wood burning oven." [9] A National Park Service historian and an architect who studied the 1876 bakery at Fort Laramie National Historic Site in 1969 were unable to determine how extensively the plans for this type of wood-burning oven were actually employed by the army. "No plans actually showing such an oven constructed at an army post were found," they reported. [10]

Perhaps, like Loudon's oven, this one represented an ideal which was seldom realized in fact. But the plans are among the few available for nineteenth century wood-burning ovens, and they are therefore reproduced here in Figure 9.



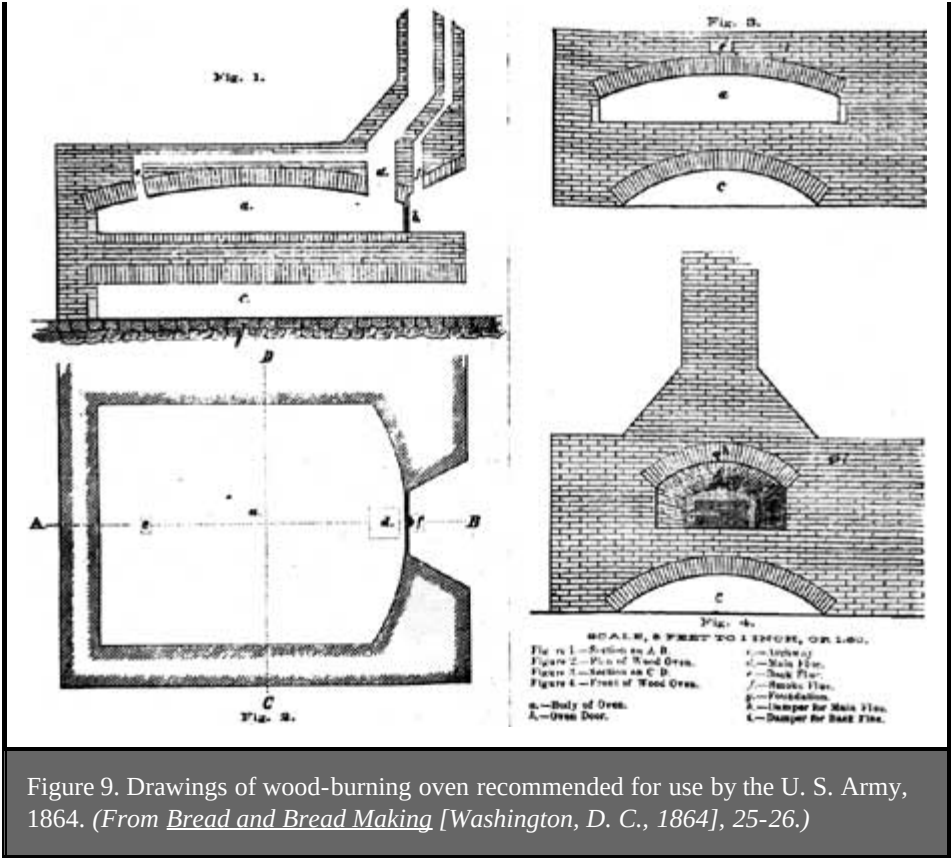


Figure 9. Drawings of wood-burning oven recommended for use by the U. S. Army, 1864. (From *Bread and Bread Making* [Washington, D. C., 1864], 25-26.)

The dimensions and other specifications for the oven pictured in Figure 9 are as follows:

Foundation (g) of brick, or rubble stone masonry, depth		18 inches.
Body of Oven, (a)	Length in clear	12 feet.
	Width in clear	9 ft. 4 in.
	Height from hearth to crown (in centre)	23 inches.
	Height at sides and back	11 inches.
Arch underneath Oven, (c)	Width span	8 ft. 5 in.
	Height at centre	3 ft. 8 in.
	Height from hearth	18 inches.
	Length from front to rear	14 feet.
Arched entrance to Oven	In front, i.e. flush with front face	Width 5 feet.
		Height at centre 2 ft. 6 in.
		Height at sides 18 inches.
	In rear, i.e. flush with Oven door	Width 2 ft. 8 in.
		Height at centre 18 inches.
		Height at sides 14 inches.
Main flue, (d)		14 in. x 14 in.
Back flue, (e)		9 in. x 5 in.

Smoke flue, (f)	14 in. x 4-1/2 in.
Distance from front of main flue to Oven door	4 inches.
Distance from back of back flue to back wall	2 feet.
Distance from back of smoke flue to Oven door	2 inches.
Oven door, (b), cast iron	2 feet wide x 14 inches high.
Hearth of Oven above floor	3 ft. 4 in.
Height of mass of masonry above foundation	6 ft. 8 in.
Distance from front to rear of same	15 ft. 6 in.
Thickness of side and back walls	18 inches.
Thickness of division wall between two adjacent Ovens	14 inches.
Maximum thickness of front wall	27 inches.
Chimney, exterior dimensions	2 feet 7 inches x 22 inches.
The <u>height</u> of the chimney to be regulated by circumstances, such as draft, nature of roof, &c., &c.	8-1/2 x 4-1/2 x
Dimensions of brick used	2-1/4
In case the bricks employed are of different dimensions from the above the necessary allowance must be made. [11]	

For a single oven of the size indicated, 13,716 bricks, 14 barrels of lime, and 210 bushels of sand would be required. For two adjoining and united ovens the materials needed would be 23,848 bricks, 24 barrels of lime, and 360 bushels of sand. These estimates include "a brick hearth for each Oven." It was recommended that fire brick be used wherever there was contact with flame, though common brick could be used in such situations but would last only two or three years. Ordinary mortar was considered best for use in ovens except where it would be touched by fire. In such locations fire-clay was recommended. [12]

Concerning means of reinforcing this type of oven, the anonymous author of Bread and Bread Making had the following to say: "Both wood and coal ovens require additional strengthening. Abutments of masonry, and other means, have been employed. The best method, perhaps, is by passing ties of wrought iron through the masonry, transversely, and from front to rear If round, they should be at least 7/8 in. in diameter, if rectangular, about 1-1/2 in. x 5/8 in. Between the washers and the masonry, on each end, pieces of scantling or timber, about 4 in. thick, should be introduced. The expansion caused by heat will affect the oven to such an extent as to require frequent attention to these ties." [13]

It was advised that "great precaution" be taken to have the oven arch of the proper height. If the arch was too high the bread would be baked too much on the bottom while the top would be unbaked. When making this arch, the first six courses of brick from the side walls should be laid in mortar. The remainder of the arch should be laid dry and the interstices filled in with grouting of mortar or cement. The arch was laid, of course, over a removable frame. [14]

The author of the pamphlet admitted that objections had been made to the back flue in the wood oven on the grounds that it allowed too much hot air to escape. Such losses would not occur, he claimed, if all flues were tightly closed by dampers when the oven reached proper temperature and the fire was withdrawn. The rear flue permitted a more even distribution of the heat, he claimed. [15]

The arch under the oven was "desirable" if the ground upon which the oven was built was

"wanting in firmness or solidity," but there were certain unspecified objections to this lower arch. At any rate, this arch was considered to be a convenient place for drying wood or for the temporary storage of ashes. [16]

When Major George Bell prepared his manual, Notes on Bread Making, for the Commissary General of Subsistence in 1882, he supplied more details concerning mortar, fire clay, bricks, and other technical matters. The formulas for mixing the various types of mortars and groutings are not repeated here because they surely were not those employed by Hudson's Bay Company artisans on the Columbia and because they are easily available to National Park Service personnel in Appendix No. 2 to Sheire and Pope, Historic Structures Report, Part II, The 1876 Bakery, HB#10, Fort Laramie National Historic Site. A complete copy of Bell's pamphlet is in the Fort Laramie Research File, Office of Archeology and Historic Preservation, Washington.

But one or two of the more general bits of information contained in Bell's booklet merit particular note. First, his diagrams of ovens show pavement in front of them at the bakery floor level. In view of the fact that hot embers frequently fell from the oven doors as the ashes were being removed, it would seem that such an area of brick, tile, or stone must have been a necessity in bakeries with wooden floors. Or perhaps, as the Hudson's Bay Company did with its stoves, a protective sheet of metal was placed before the ovens. Second, the ovens shown in Bell's diagrams were not composed of solid masonry as were those in the 1864 pamphlet. Rather, sand was used as filling material both over the baking chamber and beneath it (between the bottom of the oven floor and the top of the archway under the oven). [17]

As a result of studying Bell's plans as well as a number of drawings of military ovens of the latter half of the nineteenth century, National Park Service Historian James Sheire and Architect Charles S. Pope concluded that at that time "period oven design almost always located the flue [chimney] at the front of the ovens." The hot air from the fire circulated around the oven, front to back and back to front and out the flue. [18] This finding seems to confirm the view that ovens such as those advocated by Loudon, by the 1864 manual, and by Bell, with their multiple flues, were somewhat more complex than those in general use, particularly in frontier situations.

[<<< Previous](#)

[<<< Contents >>>](#)

[Next >>>](#)

Fort Vancouver

Historic Furnishings Report: Bakery



CHAPTER IV:

COMPARATIVE DATA: BAKERY LAYOUT AND EQUIPMENT

Bakery Layout

Nineteenth century manuals on baking often contained advice on the physical arrangement of bakeries. As was the case with ovens, however, these treatises rather generally devoted more space to saying what ought to be done than to describing current practices. Nevertheless, there is a considerable amount of useful information in such essays, and the essence of several of them is given below in order of date:

1. 1805. Chapter IX of A. Edlin's A Treatise on the Art of Bread-Making, published in London in 1805, is concerned with the structure of a bakehouse. The pertinent sections of his remarks are as follows:

A bakehouse is a manufactory where bread is made for the purposes of sale. In order to render it convenient, it should be attached to the dwelling house, and have an inner door opening into the kitchen, and likewise an outer door to open into a small yard. In this yard there ought to be a well or pump, as also a shed for the piling of faggots. The room should be large and commodious, and the floor laid with stone or tiles. On one side should be erected a dresser or counter, with suitable shelves above it; on another side a kneading trough, about seven feet long, three feet high, two feet and a half broad at top, and sixteen inches at bottom, with a sluice board to pen the dough up at one end, and a lid to shut down like that of a box. On the third side a copper that will contain from three to four pails of water should be erected, which is far preferable to the filthy custom of heating the water in the oven; and on the fourth side the oven should be placed. A bakehouse built upon this plan will, perhaps, be as commodious as art can render it; but, of late years, an alteration has been made in the manner of fitting up the oven and copper, that both may be heated with the same fire . . .

In order to comprehend the usefulness of this improvement, it will be necessary to state that an oven, built upon the old principle, is usually of an oval shape; the sides and bottom of brick, tiles, and lime, and arched over at top with a door in front; and, at the upper part, an enclosed closet with an iron grating, for the tins to stand on, called the proving oven . . .; many intelligent bakers have, within these few years past, had their ovens built upon a solid base of brick and lime, with a door of iron furnished with a damper to carry off the steam as it rises. On one side of it is placed a fire-place with a grating, ash-hole, and iron door, similar to that under a copper, with a partition to separate it from the oven, and open at the end. Over this is erected a middling-sized copper with a cock at the bottom . . . [1](#)]

2. 1854. Charles Tomlinson's Encyclopaedia of Useful Arts, issued in London and New York in 1854, drew heavily upon Edlin for its essay on "Bread." The extent of the borrowing is evident from the following paragraph on bakery arrangement:

The bake-house ought to be a large room, with a dresser on one side, with suitable shelves above it. On another side is the kneading-trough, which is about 7 feet long, 3 feet high, 2-1/2 feet broad at the top, and 19 inches at the bottom, with a sluice-board, to pen up the dough at one end, and a lid to shut down. The third side contains a copper, capable of holding 3 or 4 buckets of water. The oven occupies the fourth side: this may be 3 or 4 feet high, with an arched roof, and a brick or stone floor, furnished with a door to shut close. The fire-place is usually at one side, and the heat is communicated by winding the flue around the oven. A portion of the fire is also used for heating the copper. The proper temperature of the oven for baking is about 450°: the bakers, however, do not use a thermometer, but judge of the heat by throwing flour on the floor; if it soon blackens, without taking fire, the heat is judged sufficient. [2]

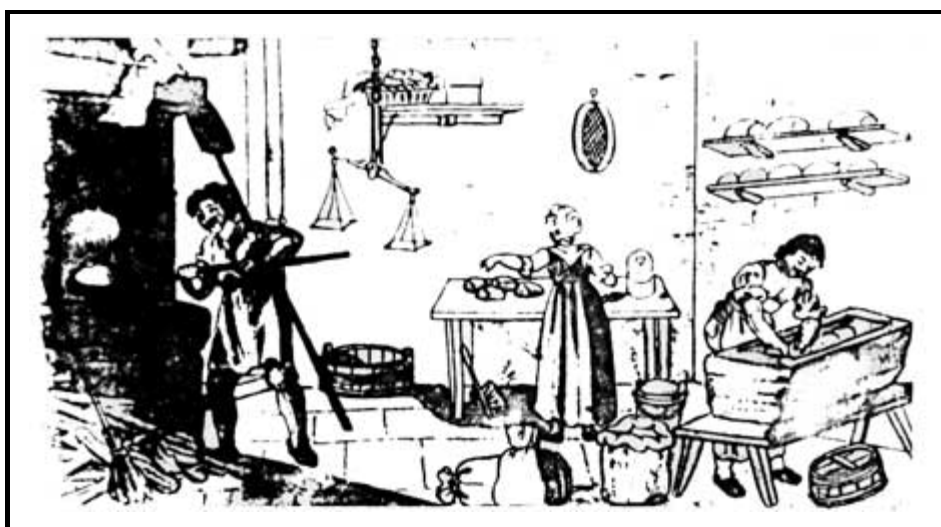


Figure 10. An early 19th century bakery of the type described by Edlin. The shelves take the place of Edlin's "dresser." (From Panschar, *Baking in America, I*, facing p. 32.)





Figure 11. A two-oven bakehouse in 1842. The circular stone or brick structure on the left evidently is the fireplace for heating the "copper" or "cauldron." Note the position of the table between the two ovens and the ceiling racks for the peels. (From Panschar, *Baking in America*, I, facing p. 32.)

3. 1870's-1880's. Studies compiled by National Park Service historians and architects for restoration of the bake ovens at Fort Laramie National Historic Site present plans of the bakeries at a number of frontier U. S. Army posts. Although for several reasons these plans do not seem applicable in detail to the Fort Vancouver reconstruction, there was one common general element which may have a bearing on the Vancouver problem. After analyzing these plans, the Park Service investigators concluded that a sleeping compartment in the bakery was considered necessary by the army in order to permit a man to be on duty at all hours, since the ovens were not allowed to cool down. [3]



Figure 12. An English bakehouse about 1854. Note temporary table for baked

loaves on the left. The counter scale for "scaling off" sits on a table to the right.
(From Tomlinson, *Cyclopaedia of Useful Arts*, I, 181.)



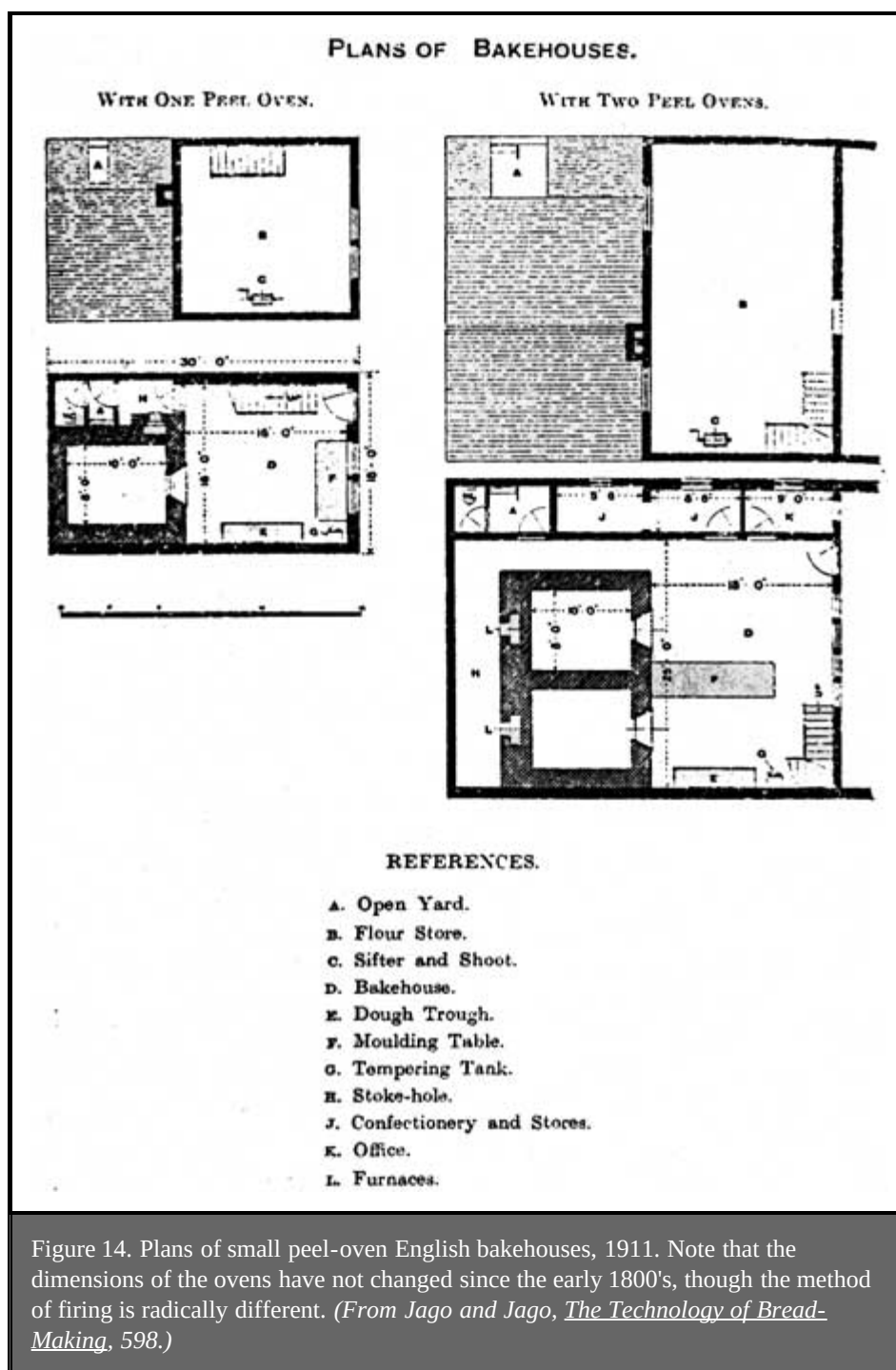
Figure 13. "Scaling off" in an English bakery, c. 1854. The dough removed from the kneading trough sits on the table at the extreme right. The man on the right is cutting the dough into loaf-size pieces which are being weighed by the man on the left. Note shape of bucket under table. Peels are stored on overhead racks.
(From Tomlinson, *op. cit.*, I, 181.)

4. 1911. On the whole, the extremely detailed The Technology of Bread-Making, by William Jago and William C. Jago, published originally in England about 1911, describes bakeries so advanced in design over those of the mid-19th century that little material contained in it is applicable to the present study. But even at that late date it was considered worthwhile to provide plans for "peel ovens." Although these ovens were much changed from the front-fired ovens of the previous century, they did retain essentially the same shape and dimensions.

Therefore, if such late improvements as side or rear stoke-holes and water closets are ignored, the basic dimensions and layouts of small bakeries appear not to have changed significantly by 1911. As will be seen by the two plans presented in Figure 14, the positions for the dough troughs and tables recommended by the Jagos are not materially different from those shown in Figure 11 depicting an 1842 bakehouse. The kneading trough is placed in a warm spot near the oven to give the dough the correct temperature, and the moulding table is conveniently nearby. Flour is stored on the second floor. [4] Apparently these plans have some utility for planning the Fort Vancouver bakery.

Bakery equipment — typical inventories

The inventories of the Fort Vancouver "Bake House" presented in Chapter I of this report provide the only available direct information concerning the bakery equipment and, possibly, other furnishings in the 1844 structure. As has been seen, however, these lists could not possibly be complete. The process of baking either bread or biscuit required more items than are found on even the most detailed of the extant inventories. It is necessary, therefore, to turn to comparative sources in an effort to determine what articles were ordinarily considered necessary to the operation of the typical small commercial bakery of the period.



Such comparative lists are difficult to find, but several are given below in chronological order. The listed items are defined and described in the next section of this chapter.

Edlin's *A Treatise on the Art of Bread-Making*, published in 1805, gives a "detail of the utensils in use in a bakehouse," stating that "the following are the most usual and indispensable requisites":

- The seasoning tub
- The seasoning sieve
- The warming pot
- The brass-wire sieve
- The pail
- The bowl

The spade
The salt bin
The yeast tub
The dough knife
Scales and weights
The scraper
Marks
The rooker
The hoe
The swabber
Peeles [sic]
Tins
Flannels
The rasp [5]

Charles Tomlinson's Cyclopaedia of Useful Arts, published in 1854, states, "The utensils of the bakehouse consist of":

The seasoning-tub
The seasoning-sieve
Wire sieves
A bucket
A bowl
A spade or shovel
A salt-bin
A yeast-tub
A dough-knife
Scales and weights
A scraper
Four or five peels
Tins, or iron plates
Coarse thick flannels
A rasp
The scuttle [sic] or swabber
Set-ups
The rooker
A hoe [6]

The manual, Bread and Bread Making, issued for the guidance of U. S. Army subsistence officers in 1864, gave the following list of utensils "required for the bakery proper":

	<u>One Oven</u>	<u>Two Ovens</u>
Pans	70	140
Rakes	1	1
Tables	1	1
Peels	2	4
Troughs	1	2
Scrapers	2	4
Sieves	1	1
Scales	1	1
Shovels	2	2
Scrub brushes	1	2

Brooms	2	4
Hatchets	1	1
Axes	1	1
Wood saws	1	1
Counter brushes	1	1
80 galls. cauldrons	1	1
Buckets	4	4

The same source listed the following utensils "required for yeast room":

	<u>One Oven</u>	<u>Two Ovens</u>
80 galls. cauldrons	2	2
Yeast tubs	1	2
Buckets	2	2
Shovels	1	1
Sieves	2	2
Strainers	2	2
Dippers	2	2
Scrub brushes	2	2
Brooms	2	2
Hatchets	1	1
Scoops	1	1
Stock yeast barrels	1	1
Ferment brushes	3	6 [7]

A revised edition of these army specifications prepared by Major George Bell and published in 1882 called, in general, for the same list of utensils. But there were several interesting additions:

Flannels: for covering bread before baking
 Paint brushes: large, soft hair, for greasing pans
 Thermometer
 Shelves: for storing bread when removed from oven. [\[8\]](#)

As has been seen, thermometers would never have been used in a small bakery of the 1840's. Even as late as the early twentieth century "there was no question of thermometers" in English country bakeries. [\[9\]](#) But it is difficult to see how "flannels" could have been omitted from the army's 1864 list; they were an essential feature of the baking process.

Bakery equipment — function and description

As far as information is available, this section describes the uses and appearance of the principal items in the lists given immediately above and in the Fort Vancouver bakehouse inventories. Articles concerning which no information is available or those so well known today as to require no explanation are not listed. Items are listed in alphabetical order. Those marked with an asterisk (*) are included in the Fort Vancouver bakehouse inventories and thus were surely present in the structure.

*Axe. The Fort Vancouver bakehouse inventory of 1844 lists one "round head Axe," while

that of 1848 records two "large square headed Axes" (see pp. 19-20 above). The Company's fur trade imported from England a large number of axes each year for use at its many posts. They were of several types and sizes. Round-headed axes, for instance, came in large, half, and small sizes. Square-headed axes were "large wedged," half, or small. [10] The firm also manufactured many axes at its depots in America, particularly the trade axes used in its traffic with the Indians. The Fort Vancouver blacksmith shop regularly turned out such axes, as archeological evidence clearly demonstrates. [11]

Whether imported or country-made, the axes used by the Hudson's Bay Company had distinctive shapes. As Mr. Louis R. Caywood has stated, they could "never be mistaken for any other type of axe of the same period." [12] In refurnishing the bakery, therefore, it will be important to obtain original H.B.C. axe heads or accurate reproductions.

A typical H.B.C. square-headed axe is well illustrated in [Plate VII](#). Museum collections in the Pacific Northwest and Canada contain good examples. Fort Vancouver National Historic Site possesses several recovered during archeological excavations. A splendid specimen is on display at Fort Columbia State Historical Park, near the mouth of the Columbia River in Washington. Another is at the Oregon Historical Society. Three Company axes are exhibited in the British Columbia Provincial Museum in Victoria.

*Biscuit stamp. The Fort Vancouver bakehouse inventories for the years 1844 to 1848 list from one to four biscuit stamps, the number varying almost yearly. Despite a considerable correspondence with biscuit manufacturers and museums in both America and Britain, the present writer has thus far been unable to obtain specifications, pictures, or even a good description of the single, hand-operated stamps such as must have been used to turn out sea biscuit or hard-tack at Fort Vancouver.

It is known that as early as the 1830's the victualling yards preparing hard bread for the Royal Navy employed mechanical stamps which at one stroke cut out 24 whole hexagonal biscuits with "a due complement of halves," punched the air holes, and impressed each biscuit with "the broad arrow of Her Most Gracious Majesty." [13] Whether the Hudson's Bay Company placed any initials or other identifying marks upon its biscuits is not apparent, but surely the air holes were punched either by the stamp or, as in France, separately by the "point of an iron [rod?]" [14]

The varying numbers of stamps in the inventories would seem to indicate that at Fort Vancouver during the 1840's the old hand-operated stamps, which impressed one (or perhaps two) biscuits at a time, were still the only ones employed. And almost surely these produced round biscuits of the type which were standard with the Royal Navy until the introduction of the mechanical stamp.

[Plate VIII](#) is a photograph of several nineteenth century biscuit stamps now in the Museum at the Royal Pavilion, Brighton, England. Unfortunately, none is for sea biscuit, and none seems to have sharp points for punching air holes. Apparently their sole purpose was to impress a design upon the dough. The picture may be of some use, however, in giving a general concept of the appearance of the ancient type of biscuit stamp. For more information on stamps for sea biscuits, see [Appendix](#).

*Blanket. The inventory of 1844 lists three "pln [plain] Blankets 2-1/2 pts [points]," and that of 1848 includes five "plain Blankets 3 points." The use of these articles in the bakery is not clear. It is possible that they served as a substitute for the flannel which was usually employed in baking loaf bread. Yet five blankets would seem an excessive number for this purpose, and H.B.C. point blankets were heavy affairs. Perhaps they were kept on hand for the use of the baker or bakers who may have been quartered permanently or temporarily in

the bakehouse, but the post records do not contain any other indication that blankets were issued to laborers. Such employees evidently provided their own bedding as a rule. In any case, it is indisputable that the bakery contained blankets.

A Hudson's Bay "point" blanket of the type used in the nineteenth century defies description. The fine blanket sold by the firm today is similar in appearance and quality, but present-day tastes call for a somewhat more refined product. Only a comparison of actual specimens will reveal the differences. Nineteenth century Hudson's Bay "point" blankets may be seen in several Canadian museums, notably the British Columbia Provincial Museum in Victoria. The blankets on display in the restored trade shops at Fort Langley and Lower Fort Garry were purchased by the Canadian National Historic Parks and Sites Branch from Charles Early & Marriott (Witney) Ltd. of England, which has been making blankets for the H.B.C. for generations; but even these blankets are not as tightly woven as those made in the 1800's.

The principal specifications for the two types of blankets mentioned in the Fort Vancouver "Bake House" inventories were probably the same as those noted by Clerk Edward Ermatinger in a hasty memorandum of 1826:

Averge wt & measure of Blkts imported 1826 --
12 Blkts — 2-1/2 pts averaged ea. 5 ft. 6-3/4 in.
length — 4.4-2/3 breadth — 6-1/4 lb Tariff 7-1/2 lbs.

6 Blkts 3 pts. av. f. 6. 3 in. length — 4.11-1/2 bdth
wt. 8-1/4 lb Tariff 8-1/2 lbs. [15]

Brass-wire sieve. See "sieve."

Broom. Although not listed in the inventories of the period, there undoubtedly was at least one broom in the bakehouse. The brooms at Fort Vancouver, in 1836 at least, were described by Narcissa Whitman as being made of "balsam" boughs. [16]

*Bucket. The Fort Vancouver inventories list from one to six buckets or water buckets as being among the bakery furnishings between 1844 and 1848, the number varying with the year. No descriptions of Company buckets are available, but U. S. Army specifications in 1864 called for bakery buckets to be "Ordinary wooden, not painted." [17] The types of buckets used in British bakeries of the period apparently are illustrated in Figures 6 and 13.

*Candlestick. One candlestick or one "tin Candlestick" appears in all the extant inventories of the Fort Vancouver bakery from 1844 to 1848. It is well known that the Company was not lavish with candles, but it does not appear that night-time baking operations could have been conducted by the light of a single candle. As shall be discussed later, it is probable that there were additional lighting fixtures. The single candlestick may have been used in the garret. In any case, it may be assumed that the candlestick was of the simplest design available, probably similar to those shown in Figure 15.

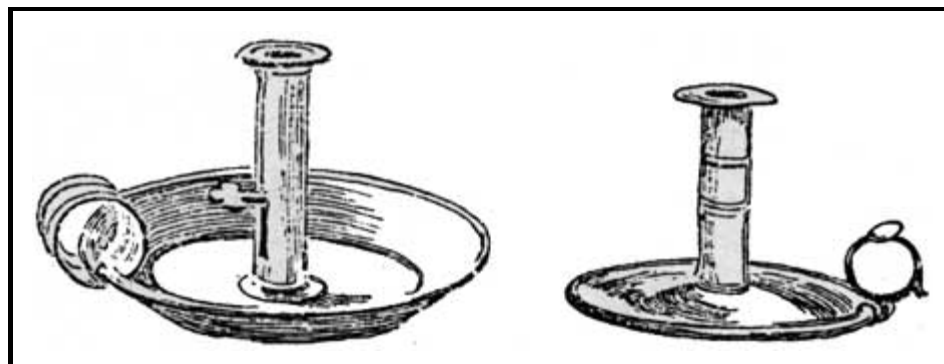


Figure 15. Canadian tin candlesticks, 1763-1830. (From C. W. Jefferys, *The Picture Gallery of Canadian History* [3 vols., Toronto: The Ryerson Press, 1942-1950], II, 204-205.)

Cauldron. A cauldron was a large vessel holding, for an ordinary bakery, up to 120 gallons. They were placed over a fire and used to heat water. According to U. S. Army baking manuals, "the best Cauldrons which can be used are those holding 80 or 90 gallons, or more. By purchasing the bowl without the furnace and stand, and having it cased in brick work, it will be more economical in fuel, and more advantageous in other respects." Cauldrons, especially in the latter part of the nineteenth century, were often built into the ovens. Sometimes they were placed on separate brick "furnaces." [18] If one of these large cauldrons had been employed in the Fort Vancouver bakery it undoubtedly would have been listed in the inventories.

Counter brush. This article is not described in any of the sources available, but Figure 10 seems to picture one in an English bakery of the early nineteenth century. It can be discerned leaning against a leg of the moulding table.

Dipper. Though not mentioned in the bakehouse inventories, a dipper would have been a very useful utensil for a process requiring the transfer of various quantities of warm water from one container to another. According to Major Bell's 1882 manual for U. S. Army bakers, the specified dipper was "Large, of block tin, holding about two quarts, with handle about 2 feet long." [19]

*Dough knife (dough cutter). The dough knife, evidently synonymous with the "dough cutters" of the bakehouse inventories, was, according to Edlin's 1805 *Treatise*, "usually of the size of a large carver, with a round point and blunt, like a painter's pallet knife. Its use is to cut the dough, when the baker is kneading it, before he throws it over the sluice board. It is also used, when the bread is weighed, to divide the different portions before they are put on the scale." [20]

Flannel. According to Edlin, "flannels" were "squares of coarse flannel . . . used for covering up the bread and rolls, after they are taken out of the oven." [21] Flannels were also used for covering the dough while it was fermenting. [22] While flannel does not appear in the Fort Vancouver bakery inventories, possibly one or more of the other fabrics which are included served the same purposes.

*Hammer. A hammer is listed in the 1848 bakehouse inventory. During archeological excavations at Fort Vancouver several "handmade" claw hammers dating from the Hudson's Bay Company period were recovered. [23] One of these, or a replica, might well serve in the refurbishing of the reconstructed bakery.

Hatchet. See "axe."

Hoe. According to Edlin's 1805 *Treatise*, the hoe as employed in bakeries was "a piece of iron, similar to a garden hoe, fixed in a handle, partly wood and partly iron." It was used "to scrape up such ashes and loose dust as escaped the rooker." [24]

*Kettle. The bakehouse inventories of 1844-1848 all list either one or two tin kettles, usually with the added note that they had a capacity of "8 gns." Since the pots or tin pots listed in the inventories seem to have been of smaller capacity, ranging in those for which sizes are given from one pint to three quarts, it seems quite probable that the large 8-gallon kettles at Fort Vancouver served the same purpose as the cauldrons or warming pots generally found in typical bakeries of the period. Edlin described the warming pot as follows:

This is a large copper pot, lined with tin, capable of holding two pails full of water. It is filled and set in the oven to warm, before the baker sets his sponge. These pots are not in universal use, as some people use earthen ones; but this mode of warming the water, however objectionable, is daily practiced by the most respectable bakers in the Metropolis [London]. [25]

Marks. Marks were employed in England in conformity to an act of Parliament requiring every loaf to be stamped to indicate whether it was "wheaten, household, standard wheaten, or mixed bread." The marks were four large tin letters, W, H, SW, and M, fixed in wooden handles, which were pressed into the dough before it was put into the oven. [26] It may safely be assumed that marks were not used on the loaf bread made at Fort Vancouver.

*Pan. The bakery inventories for 1846 and 1848 list "2 Tin Pans." The nature of these pans is not evident, but because of their number it seems most probable that they were not the same as the "pans" or "bread pans" employed in such large numbers by U. S. Army bakeries in the latter part of the nineteenth century. In fact it is likely that bread was not baked in pans at all at Fort Vancouver. The so-called "cottage loaves," the type commonly made in English bakeries before the introduction of mass baking methods, were simply shaped by hand and placed directly on the hot floor of the oven without tins. Even beyond the end of the century these cottage loaves "were considered the sweetest bread of all." [27]

For what it is worth, however, the U. S. Army "15 ration" bread pan of 1864 was 17 inches wide, 22 inches long, and 3 inches deep." [28]

Peel. The peel has been defined as "a sort of shovel, with a long handle, used to set the bread in the oven, and also to take it out." [29] Ordinarily peels were made from a single piece of wood, but those used for handling tins and pans generally had iron blades, as often did those employed in making biscuits. And, as shall be seen below, the wooden blades of some peels were separate pieces which were fastened to the poles by various means. Occasionally peels were made entirely of wrought iron. [30] The blades, whether of wood or iron, were flat and as thin as practicable.

Edlin's 1805 Treatise contains a lucid discussion of the types of peels in ordinary use in England at that time:

There are usually four peels [sic] kept in a bakehouse, viz, the quartern peel, to set the quartern loaves; the half quartern peel, for the half quartern loaves; the drawing peel, for drawing out the bread; and the peels for placing and removing tins [for rolls, pies, and puddings]. The quartern peel is a pole about eight feet long, with a wooden blade, about a foot wide and sixteen inches long, fixed at the end with strong screws. The half quartern peel is of the same kind, about half the length, and much smaller. The drawing peel is a strong pole, ten feet long, with a blade, thicker, broader, and longer than the others; and the peel for setting in the tins has a strong blade of iron, instead of wood, which is fixed with screws into the handle. [31]

Peels specified for the U. S. Army in 1864 were described as: "Size of blade — 10 in. wide, 24 in. long; pole, long, 16 feet, short, 10 feet long." [32] This terse description does not make clear whether the blade was one piece with the pole or a separate piece, but since the army peel was largely for handling pans, the blade probably was of iron. The specifications for 1882 are not much clearer: "blade 20 inches x 10 inches attached to a ten foot pole, for removing bread from the oven." [33]

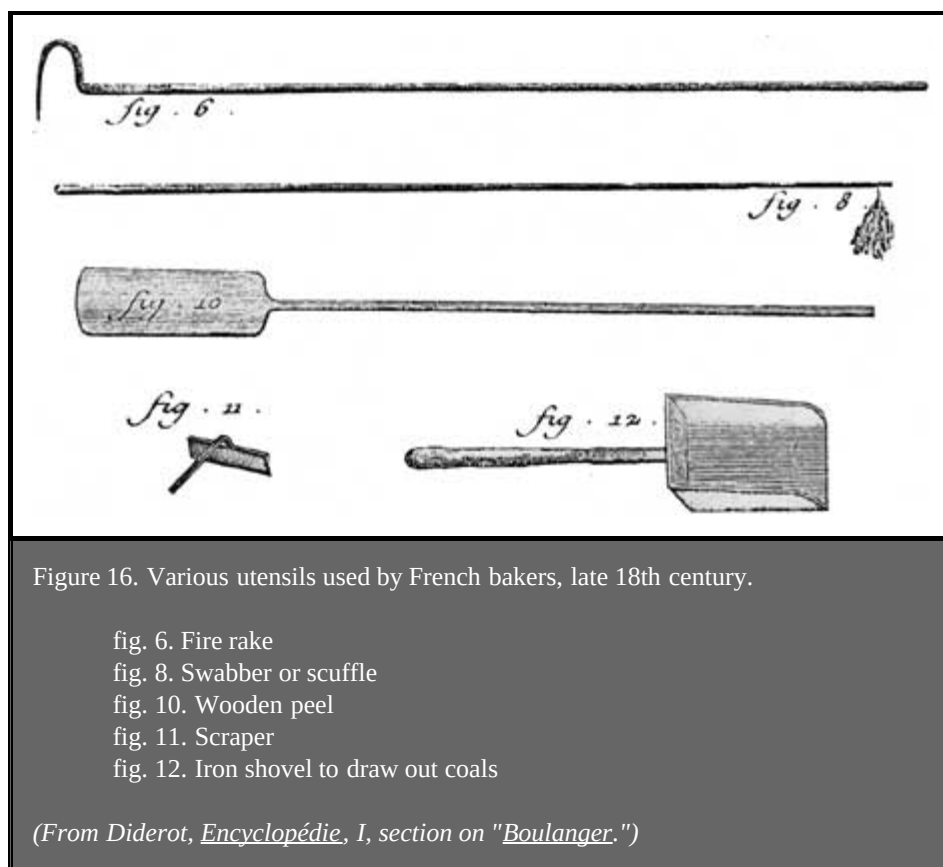
The peel used in France at the end of the eighteenth century was made from a single piece of

wood, as is clearly shown by "fig. 10" in Figure 16. This type of peel was brought to Canada by the earliest French settlers and was widely used, even by the English in Canada, during the early nineteenth century.

A present-day specimen of the Canadian peel, used for demonstration purposes at Fort York, Toronto, was carved from a single piece of soft pine. It was measured by the present writer in May, 1973, and found to have the following dimensions:

Width of blade	8-1/8"
Length of blade	16"
Overall length of blade and handle	66-1/2"
Thickness of blade at tip	1/4"
Thickness of blade at base of handle (pole)	3/4"
Cross section of handle (oval in shape)	7/8" x 1-5/8"

For a photograph of a companion peel to the one described above, see [Plate IX](#). When not in use, peels were commonly stored in overhead racks. See Figures 6 and 11.



***Plane.** The 1848 bakehouse inventory includes "1 jack Plane." The use of this carpenter's tool in the bakery is not immediately apparent, but its presence cannot be disputed. Undoubtedly it would have been a typical English plane of the period.

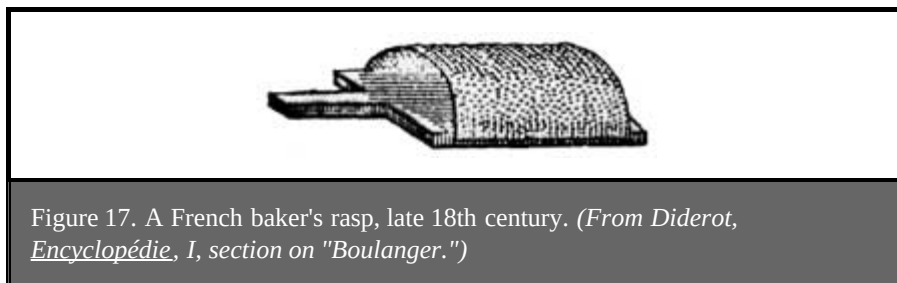
***Pot.** From one to three tin pots are listed in the 1844-1848 bakery inventories, the number varying from year to year. Sizes, when given, are one pint and three quarts. As pointed out under the heading "Kettle," these small pots evidently do not correspond to the larger "warming pot" so commonly employed in British bakeries of the period. Since no dippers are listed in the Fort Vancouver bakehouse inventories, the small pots may have served as substitutes.

It is impossible to judge whether these smaller pots were imported from England or were "country made" by the tinsmiths at Fort Vancouver. No information on the design of the pots used at the Columbia depot seems to be available.

Rake. See "rooker."

Rasp. Edlin in 1805 defined the baker's rasp as a "large, coarse, broad, flat, steel file, with a wooden handle that runs over the back. Its use is for rasping the burnt crust off the bread, and a finer one is kept to rasp the French rolls." [34] Rasps of this same description were still being employed by the U. S. Army in 1882. [35]

The rasp employed by French bakers during the late eighteenth century seems to have resembled a grater more than a file. It also had a wooden handle and back. See Figure 17.



Rooker. According to Edlin's 1805 Treatise, a rooker was "a long piece of iron, in shape somewhat resembling the letter L, fixed in a wooden handle." It was used "to draw out the ashes from all parts of the oven to the mouth." [36]

A picture of an eighteenth century French utensil which must have been almost identical in appearance as it certainly was in function, though called a rable or fire-rake, is shown in "fig. 6" in Figure 16. U. S. Army manuals in the latter half of the nineteenth century do not list rookers among the required bakery utensils, but they do call for rakes, which served the same purpose. Such rakes were described only as being "14 feet long." [37]

A rake or rooker employed today for baking demonstrations in the small oven in the Officers' Quarters kitchen, Fort York, Toronto, is illustrated in Plates IX and X. The kitchen dates from the general period of the Fort Vancouver bakery, but the age of the rake and the basis of its design are not known. This rooker is interesting, however, since it seems to combine a rake and a hoe in a single utensil.

Salt bin. This container was described in 1805 as "a bin, with a lid on it, similar to a corn bin. It will hold two sacks of salt, and is usually placed near the oven, as salt is apt to get moist if not kept in a dry place." [38] A salt bin was still considered a necessary piece of equipment for an English bakery as late as 1854, but U. S. Army manuals of 1864 and 1882 do not call for them, perhaps because the need for salt containers was so obvious. [39]

*Saw. The Fort Vancouver bakehouse inventories for 1846 and 1848 each included "1 hand saw." U. S. Army manuals specified one "wood saw" as required equipment for one- and two-oven bakeries. [40] Undoubtedly such saws were used to cut logs into suitable lengths prior to splitting them into firewood.

*Scales, steelyards, and weights. The bakery inventories reveal that the processes of bread making and biscuit making at Fort Vancouver involved the use of a diverse assortment of weighing devices. In 1844, 1845, and 1846 these apparently consisted of a pair of "tin scales, a pair of steelyards capable of weighing up to 100 pounds, and from one to three lead

weights. The inventory of 1848 was somewhat more specific and included additional items. It listed "1 iron weighing Beam & tin Scales," "1 pr beam Steelyards, to weigh 110 lbs," and "1 pr beam Steelyards, to weigh 1400 lbs." Weights were not mentioned in 1848 but must have been present. The information in the 1848 inventory is sufficient to permit a determination of exactly what types of weighing devices were employed, though of course precise patterns and manufacturers are not known.

The weighing beam was perhaps the most ancient type of equal arm balance. It consisted of a rod or beam, supported in the center by a cord or some type of bearing, with pans suspended from the two ends, one pan to hold the weights and the other the material being weighed. Such balances were commonly used in the fur trade and also, as can be seen from the scales shown in Figure 10, in English bakeries of the early nineteenth century.

As is shown by Figures 12 and 13 in this report, however, by the early 1850's at least, another type of equal arm balance, the counter scale, was much favored by English bakers. The counter scale was specified for use in U. S. Army bakeries in 1864. The Fort Vancouver inventories seem to prove that, by 1848 at least, such conveniences had not yet been provided for the bakery at the Columbia District depot, although there were "counter Beams" then in use elsewhere in the post.

The steelyard (pronounced in Britain as "stilyard") was also an ancient device utilizing the principle of unequal arm balance or the lever. In its simplest form it consists of a rod or bar suspended from a hook fixed near one end. The object to be weighed is suspended from another hook hanging from the short side of the bar. The longer end of the bar is marked with notches to designate units of weight; and a moveable weight or counter-poise is moved on this marked arm until equilibrium is achieved. By keeping the hook for the objects to be weighed close to the fulcrum, this type of scale can be constructed to weigh very heavy items. In the early nineteenth century steelyards were hand-forged and generally stamped with the capacity of the scale. [41]

Since beam scales and steelyards are such well-known articles, it has not seemed necessary to illustrate them in detail in this report. The works cited in footnote 41 above contain pictures of scales of these types. Volume II of the Historic Structures Report. Fort Vancouver, will contain additional illustrations of weighing devices used by the Hudson's Bay Company. A fine example of an early nineteenth century weighing beam is pictured in Collections of the State Historical Society of Wisconsin, XIX (1910), facing page 375.

Scoop. A scoop was among the items specified by the U. S. Army in 1864 for use in the yeast room. [42] None of the other lists of bakery utensils examined by the present writer lists scoops, but such an article would seem of utility where various amounts of flour, salt, and other ingredients had to be measured and handled. Since the army's scoops were to be employed in the yeast-making process they probably were not the ordinary scoop shovels which served many purposes in the bakery (see "shovel").

Scraper. Edlin, in 1805, described the scraper as "a small scraper, like a garden hoe, fixed in a short wooden handle." It was used "to scrape the sides and bottom of the trough, to prevent the dough from adhering and drying there." [43] A French scraper (ratissoire) of the late eighteenth century is pictured in "fig. 11" in Figure 16.

Tomlinson, in 1854, described the scraper in almost the same words, but he added the information that the utensil was also used for scraping the dough off the moulding board. [44] The scrapers used in U. S. Army bakeries by 1864 were described simply as being "6 in. long, 4 in. wide (made of steel)." [45] There was no mention of a handle. Bell's 1882 manual, however, returned to the older form of definition: "steel, made like a hoe with a short handle,

for scraping dough from trough or table." [46]

Scrub brush. Described by Bell in 1882 as "The usual kind — used for cleaning yeast-tubs, &c." [47]

Scuffle. See "swabber."

Seasoning sieve. This utensil, according to Edlin, was "a common sized hair sieve . . . used for straining the mixture through, that is prepared for setting the sponge." [48] By 1854 Tomlinson was describing the "seasoning-sieve" as "made of hair, or of tinned iron, with holes drilled through it." [49] Hair sieves were not mentioned in U. S. Army specifications of 1864 and 1882, evidently having been replaced by tin strainers (see "strainer").

Seasoning tub. According to Edlin in 1805, the seasoning tub was "the size and shape of the common wash tub" and was "intended for mixing the yeast, salt, and water together, before the sponge is set." [50] Tomlinson in 1854 did not consider it necessary to describe this article, though he listed it among the standard bakehouse utensils.

Set-ups. Mentioned only by Tomlinson in 1854, "set-ups" were "four-sided oblong pieces of beech, for placing on both sides, and at the back and front of the oven, to keep the loaves in their places." [51]

*Sheeting. The Fort Vancouver bakery inventory for 1846 listed "18 Yds duck Sheeting" and that for 1848 included "2 duck sheeting table Cloths — 42 yds." Evidently this material was used in the bread-making process — it would scarcely have been furnished by the Company for the bakers' dining table — but exactly how is not known.

*Shovel. The inventory of 1848 records the presence of "1 iron Shovel" in the Fort Vancouver bakery. A shovel, or spade, is included in every available list of necessary bakery equipment. Unfortunately the same lists provide little in the way of description.

In 1805 Edlin stated that a spade was "requisite for a variety of purposes," being "of the same kind as are in common use," [52] Tomlinson in 1854 merely recommended "a spade or shovel." [53] The shovels specified for U. S. Army bakeries in 1864 and 1882 were iron scoop shovels. [54]

Shovels seemingly were used in transferring large quantities of flour from one place to another during the sifting and other parts of the dough-making process. They were also sometimes used for removing coals from the oven and placing them in buckets for disposal. A French short-handled iron scoop shovel "to draw out coals" is illustrated in "fig. 12" in Figure 16.

Sieve. In addition to the "seasoning sieve" or strainer already noted, bakeries of the nineteenth century employed wire sieves. Included among Edlin's "indispensible requisites" was a "brass-wire sieve," described as a "large round sieve, covered with a sheet of exceeding fine, wove, brass-wire." Its use was "not only to sift the flour before it is kneaded; but also to detect any lumps, or other impurities, that may be contained in it." [55] U. S. Army specifications in 1864 and 1882 called for wire sieves — "gauge, about No. 12, for sifting all flour." [56] An English sieve of about 1847 may be seen in the foreground in Figure 6, and one is hanging on the wall in Figure 10.

Spade. See "shovel."

*Steelyard. See "scales, "

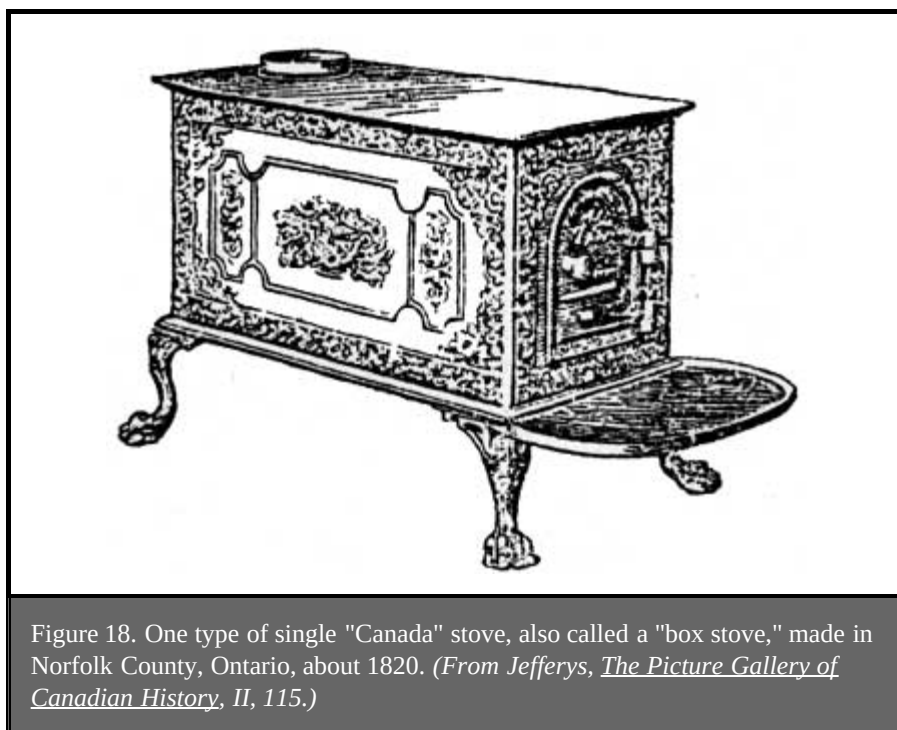
Stock yeast barrel (stock yeast tub). Stock yeast barrels or tubs (as distinguished from yeast tubs) are mentioned in the U. S. Army bakery manuals for 1864 and 1882 but not in the earlier British works upon which this section is largely based. Stock yeast tubs were defined as "similar to yeast-tubs [q. v.], but holding about one-half as much." [57]

*Stove. The Fort Vancouver bakehouse inventory for 1848 lists "1 Canada single Stove 3 ft." "Canada" stoves were distinctive in appearance, though they came in several sizes and shapes, with numerous minor differences in the cast-iron decorations and fittings. By the 1840's they had long been made in Canada, though many of the stoves of this type employed in the fur trade were manufactured by the Carron Company of Falkirk, Scotland, and imported. [58]

Those carried in stock at the Fort Vancouver Depot and, presumably, employed for heating the post structures, were inventoried as "cast iron single Canada stoves"; they were of two sizes, 30-inch and 36-inch. [59] They came in six major pieces, which could be disassembled for easy transport and storage. In August, 1841, the Rev. Henry Harmon Spalding at Lapwai Mission in the present Idaho ordered one of these stoves from Fort Vancouver and described it as follows: "one 6 plate stove, complete with the middle plate which is wanting in ours here. A stove consists of 2 sides, 2 ends, top and bottom, 4 legs, 4 rods, 2 middle plates. Also put in bundle of 12 plates of sheet iron for pipe." [60]

A drawing of a single Canada stove is presented in Figure 18. Other examples are pictured in Plates [LXIII](#), [LXVII](#), [LXVIII](#), [LXIX](#), and [LXX](#) of Hussey, *Historic Structures Report, Fort Vancouver* vol. I. A number of these stoves survive in Canada, notably at Lower Fort Garry National Historic Park near Winnipeg.

Strainer. The strainer, under that name, first turns up, in the sources consulted, in the U. S. Army 1864 list of utensils required for the yeast room. It was there described as being "12 in. deep, 12 in. in diameter at the bottom, and 15 in. in diameter at the top. Made of block tin, filled with 1/8 and 1/16 holes, 4 handles to the rim." [61] Evidently this utensil replaced the old hair sieve, since it was some times called a "yeast strainer." [62]



Swabber. Also known as the "scuffle" or "swab," this utensil was described by Edlin in 1805

as "a common pole, about eight feet long, with a quantity of wet netting fastened to the end." It was used "to clean out the bottom of the oven, after the ashes have been removed, previous to setting in the bread." [63] Tomlinson, in 1854, called this article a "scuttle" [sic] or "swabber," but his description was almost exactly the same as Edlin's. [64] For some unknown reason the U. S. Army bakery manuals of 1864 and 1882 do not list swabbers among the necessary bakehouse utensils.

A French "baker's oven mop" (ecouvillon) is pictured in "fig. 8" in Figure 16.

*Table. The Fort Vancouver bakehouse inventories for 1846 and 1848 each list "3 Tables." There seems to be no way of knowing the exact design of these tables, but undoubtedly they were made locally of wood available in the vicinity of the depot, most probably Douglas fir. Probably they resembled common British and Canadian deal tables of the period. See Figures 3, 10, 11, and 12.

Tables recommended for U. S. Army bakeries in 1864 were 4 feet wide, 14 feet 10 inches long, and 2 feet 10 inches high. [65]

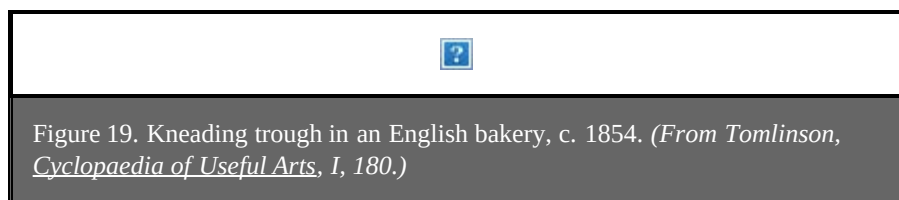
*Table cloth. See "sheeting."

Tins. In his 1805 Treatise, Edlin stated of "tins": "These are iron plates of different sizes. The most usual are about an eighth of an inch thick, two feet wide, and three feet long. The rolls, pies, and puddings are put upon these tins, and then the baker runs the blade of the peele under each of them, and places them into any part of the oven he desires, with the utmost facility." [66]

Trough. The "trough," "kneading trough," or "dough trough" was an absolutely necessary feature of any commercial bakery, and its use continued long beyond the introduction of mechanical mixers. [67] Its functions have already been adequately treated in Chapter II on the baking process.

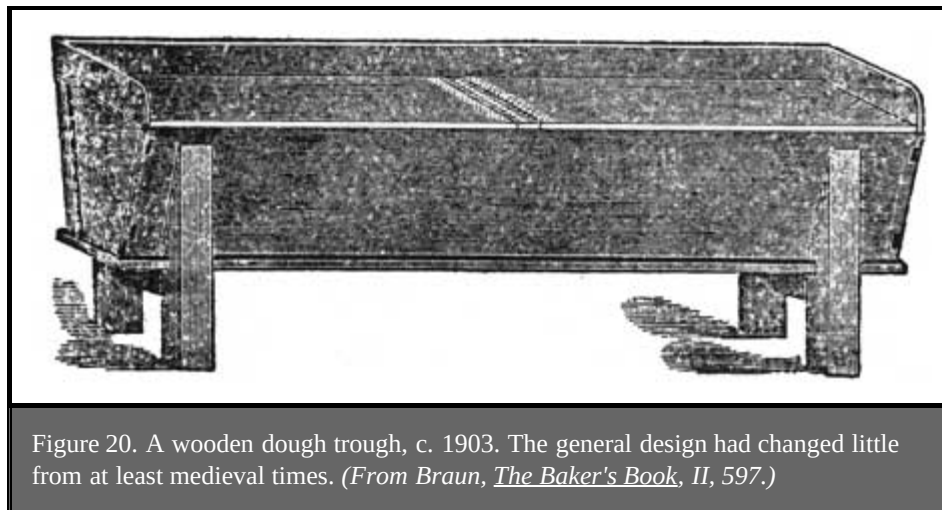
According to Edlin, in 1805, the ideal kneading trough was "about seven feet long, three feet high, two feet and a half broad at top, and sixteen inches at bottom, with a sluice board to pen the dough up at one end, and a lid to shut down like that of a box." [68] Tomlinson's recommendation in 1854 was the same, except that he said the trough should be 19 inches broad at the bottom. [69] Evidently both of these writers considered it superfluous to mention that the troughs were made of wood.

The 1864 baking manual for the U. S. Army was more specific, though the trough described was longer than those in most small English bakeries: "Troughs should be made of 2-1/4 inch pine plank, 15 feet 8 in. long, by 2 feet 6 in. at top, 22 in. at bottom, and 18 in. in depth inside measurement; and top of Trough, 2 feet 10 in. from the floor; Trough top should be in two equal sections; two sets of boards are needed in each Trough for separating Flour, Sponge and Dough." [70] Although not so stated, it is evident that this trough stood on legs, as seems to have been a common case in England also.



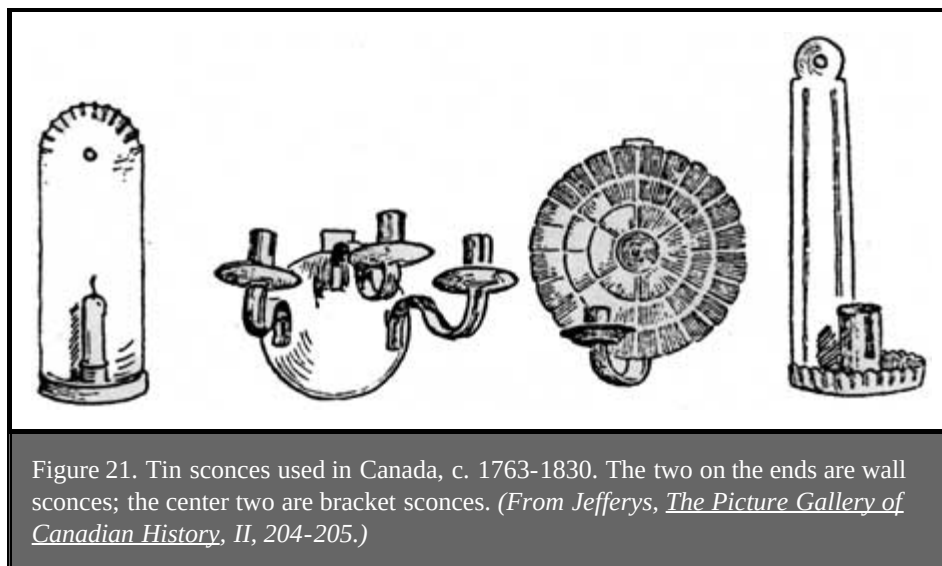
A trough which must have closely resembled those described in the 1864 manual is shown in Figure 20. Troughs in typical English bakeries of the nineteenth century are shown in Figures

6, 10, and 19.



Warming pot. See "kettle."

*Yeast tub. The Fort Vancouver bakehouse inventory for 1848 includes "2 yeast Tubs." Edlin, in 1805, described the yeast tub as "a common, six-gallon cask with a large bung hole and cover. . . .used for preserving the yeast." [71] The yeast tubs recommended for the U. S. Army in the latter half of the nineteenth century were in size "2/3 of whisky barrels, with side handles"; they were used "for storing yeast." [72]



Lighting fixtures. It will have been noted that the only means of lighting listed in the Fort Vancouver bake house inventories was a single candlestick, and this fixture may have been employed in the living quarters if there were such. Almost certainly if a lamp had been used to light the bakery proper it would have been included in the inventories. It can be assumed, therefore, that the bakery could not boast of a lamp. Yet it is most probable that night-time operations were carried on in the bakery and that some means of illumination other than a single candle was employed.

On the basis of information now available, no one can say with assurance what that means was. It is known, however, that rooms, particularly larger rooms, at Hudson's Bay Company posts were often lighted by tallow candles placed in sconces affixed to the walls. [73] Since sconces undoubtedly were "country made" they perhaps would not have been included in

inventories of articles "in use." Examples of Canadian tin sconces of the early nineteenth century are shown in Figure 21 on the following page.

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

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Fort Vancouver

Historic Furnishings Report: Bakery



CHAPTER V:

COMPARATIVE DATA: OTHER FURNISHINGS

As can be seen from the material presented in the previous chapter, there is a reasonable amount of information available upon which to base the furnishing and equipping of the bakery proper. The required articles might be difficult to obtain, but at least their names, descriptions, and uses are known in most instances.

The case with the living quarters which probably were located somewhere in the bakehouse is quite different. Very little is known about the furnishings of the accommodations for common laborers at Fort Vancouver. No inventories thus far examined list "articles in use" in the dwellings in the village where most of the workmen lived or in identifiable workmen's quarters within the pickets.

To complicate matters further, it now appears that Joseph Pétrain, the depot baker in 1845-1846, did not live in the bakery structure, except perhaps for short periods. As has been seen, he had a house outside the pickets during his employment by the Company. Therefore it seems probable that no quarters for his family were located in the bakery.

If anyone lived in the bakehouse to keep the oven heated and to tend to the yeast and dough, it may have been one or more of the assistants to the baker. Perhaps Pétrain remained on the scene on a round-the-clock basis during times when large orders had to be filled.

Although there are no firm data to go on, it seems likely that any employees quartered in the bakery were lodged in rough "bachelor-type" accommodations, probably on the upper floor or garret. Undoubtedly all were housed in a single room.

Unmarried men's quarters

In England during the early nineteenth century little attention was paid to providing comfortable or even healthful quarters for servants and farm laborers. "The Sleeping-Rooms for unmarried Farm Servants, in most parts of Britain," wrote that indefatigable crusader for better rural conditions, John Claudius Loudon, in 1844, "are generally such as merit extreme reprobation." He quoted another writer who believed that "the health of servants is often less attended to than the health of cattle." [1]

While it would not be just to accuse the Company of such neglect, yet there is abundant testimony to the fact that the quarters of its ordinary "servants" were far from luxurious. In 1841 Assistant Surgeon Silas Holmes of the United States Navy visited the home of a Company farmer near Fort Vancouver. The structure, he noted in his journal, was "wretched log hut, containing one room only, about 10 feet square and filthy beyond description; it contained no other furniture than a pine table and an iron pot; the bed, if it could be called one, consisted of rough pine logs covered by a single blanket . . . and in this house ate drank and slept the farmer, his wife, their three children and the farm servant." [2]

At many Hudson's Bay posts, though not at Fort Vancouver, the lower grades of employees, along with all the other grades, were routinely housed within the stockade enclosure. Their quarters were not unlike military barracks. Clerk Robert Ballantyne described one of these men's houses as he found it at Fort Garry during the 1840's:

It was large, and low in the roof, built entirely of wood, which was unpainted The men's beds were constructed after the fashion of berths on board ship, being wooden boxes ranged in tiers round the room. Several tables and benches were strewn miscellaneous about the floor, in the centre of which stood a large double iron stove, with the word "Carron" stamped on it. This served at once for cooking and warming the place. Numerous guns, axes, and canoe-paddles hung round the walls or were piled in corners, and the rafters sustained a miscellaneous mass of materials [3]

A former carpenter at Fort Ellice left a somewhat similar picture of the servants' quarters at that prairie post during the 1870's:

There was the men's house, the mechanics' house, the native servants' and dog drivers' houses, also the married servants' houses, each consisting of one large room.

A door opened into each from the outside and there was no other means of entrance Two tiers of rough bunks round the walls represented sleeping accommodations. A large mud chimney and open fire-place provided ventilation. We did all cooking at the open fireside. [4]

There are no known descriptions of the beds in the unmarried men's habitations at Fort Vancouver, but there is ample testimony to the effect that the sleeping accommodations in the quarters of the clerks and even some of the officers consisted of simple wooden bunks. [5] If the Company's "gentlemen" had to be content with bunks, surely the laborers fared no better.

More descriptions of servants' quarters could be quoted, but these will suffice to demonstrate the points to be made here: (1) that the ordinary "servants" and even the skilled mechanics and artisans at the Company's posts lived in very plain quarters, with no frills and few comforts; (2) that the beds provided in the men's quarters ordinarily were rough wooden bunks; (3) that one stove or fireplace generally sufficed for both heating and cooking in the men's quarters; (4) that when the Company provided the living accommodations a number of persons ordinarily shared each room; and (5) that in addition to the beds and heating facilities, the furnishings consisted merely of a rough table or two, several benches, perhaps a few boxes or chests, a bare minimum of cooking and eating utensils, and the men's clothing and other personal effects.

Although the present writer knows of no picture of the interior of the laborers' quarters at any Company establishment, there exists a sketch dated 1848 and entitled "Interior of H. B. C. Post at Pembina," which, though probably depicting the room of a clerk or even a commissioned officer, conveys an impression of the accommodations provided for all employees except the highest ranking officers. It is reproduced in [Plate XI](#).

Married men's quarters

The descriptions given above, except that of the farmer's hut, are mainly applicable to the quarters of unmarried servants or of those whose female companions remained outside the

pickets. If, however, it is assumed that the baker's assistants who may have been quartered in the bakehouse were married, or if it is assumed that Pétrain and his family lived in the bakery periodically, the problem of refurnishing becomes more difficult. Even less is known about the domestic accommodations of the Company's married laborers.

For comparative data it is necessary to turn to a description of the home of a typical French Canadian voyageur (not necessarily a Company employee) in the fur-trading country as penned by H. M. Robinson somewhat after the middle of the last century:

Internally the house is one single apartment; occasionally, in the better class, though rarely, two apartments. The floor is of planks sawed or hewed by hand; the ceiling, if there is any, of the same material. In one corner is the only bed, a narrow couch, painted, generally, an ultra marine blue, or a vivid sea-green. An open fire-place occupies one end of the apartment, with the chimney within the walls. A table, one or two chairs, a few wooden trunks or boxes — doing duty with this people everywhere as table, chair, clothes-press, and cupboard — and a dresser, constitute the furniture. About the walls somewhere, more especially over the bed, hang colored prints of the Virgin, the sacred heart, etc., together with a rosary. It may be that the daughter of the house — and there is always a daughter — has come under the influence of a convent for a season, and can read; perhaps write. In that event, there is a copy of the "Lives of the Saints" on a bracket, and, it may be, a few periodicals. For the rest, the apartment is cheerless and uninviting. It may be clean, but the chances are that it is not. That peculiar aroma, too, which pervades all inhabited chambers, here becomes often aggressive and, as it were, wrestles with the visitor for mastery. [6]

No picture of the inside of a Company laborer's dwelling at a Western post is known to exist, but a sketch of the interior of a Red River settler's house during the early nineteenth century, attributed to Peter Rindisbacher, probably is not too far off the mark. A copy will be found in [Plate XII](#). It shows a table, shelf, chair, and, perhaps, a bench which undoubtedly were much like those made at Fort Vancouver.

Types of chairs which might have been made by the French Canadian workman for themselves or which may have been available from the carpenter shop are shown in Figure 22.



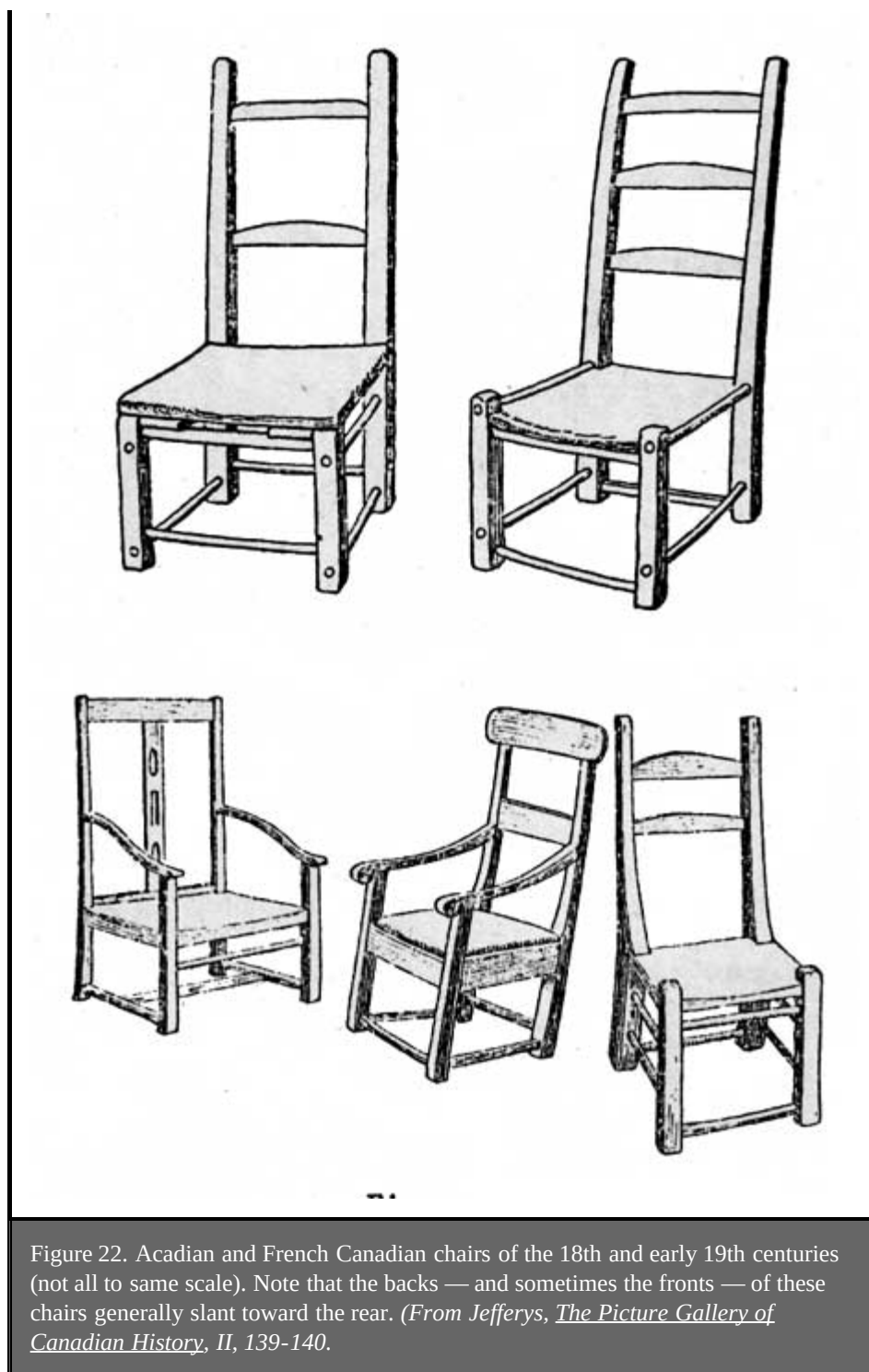


Figure 22. Acadian and French Canadian chairs of the 18th and early 19th centuries (not all to same scale). Note that the backs — and sometimes the fronts — of these chairs generally slant toward the rear. (From Jefferys, *The Picture Gallery of Canadian History*, II, 139-140.

Storage

The Hudson's Bay Company did not habitually waste space. The garrets of living quarters and other structures were ordinarily put to some use — for the drying of lumber, for the storage of materials of various types, and for additional dwelling room. [Z]

Even if the garret of the bakery was used for living quarters, as seems probable, it is almost certain that a good portion of the space was given over to storage. There are no records which indicate what may have been kept there, but it is reasonable to suppose that a sizable reserve of flour was kept on hand somewhere in the bakery. The weather was frequently wet and the bakery was a considerable distance from the granary or nearest warehouse. As shown

by the plans in Figure 14, the upper stories of British bakeries were quite generally used for flour storage.

Flour at Fort Vancouver appears ordinarily to have been stored and shipped in barrels rather than in sacks. [8] No indication has yet been found of the weight of each barrel. However, flour was generally inventoried and sold by the hundredweight (112 lbs.). [9]

The Canadian Historic Sites Service in Ottawa has made a study of the barrels used by the Hudson's Bay Company and has developed a source of supply for such containers hand-made in the old style. If it is decided to display barrels in the bakery, it is suggested that inquiry be made of that service.

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

fova/hfr1/hfr5.htm
Last Updated: 28-Nov-2005

Fort Vancouver

Historic Furnishings Report: Bakery



CHAPTER VI:

RECOMMENDATIONS

Structure

1. In general, the bakery should be reconstructed along the lines suggested on pp. 59-60 of the Historic Structures Report, Fort Vancouver, vol. I. Subsequent research, however, has indicated certain modifications or refinements which appear desirable. These are treated in the following paragraphs in this section.

2. The footings and foundations upon which the heavy sills rested appear to have been of one of two possible types commonly employed by the Company, but it seems impossible to determine positively which type was actually used in the bakery. Archeological excavations revealed the existence of footings, made of heavy slabs of wood about three inches thick, spaced approximately ten feet apart along the lines of the sills; but no evidence was found of what sort of foundation rested on those footings. Excavations at the Big House seem to show that in that structure, at least, the sills rested directly on similar footing blocks. [1] Such an underpinning arrangement would have been very suitable for the bakery, since the sills (and hence the floor) would have been quite close to the ground, permitting the height of the oven complex to be lower and thus requiring fewer bricks.

On the other hand, in Hudson's Bay Company structures the sills quite often rested on vertically grained blocks of wood, or portions of tree trunks, which in turn sometimes rested on horizontally grained slab footings. With this type of foundation, the floor was elevated about 1-1/2 feet or more above the ground, depending on the height of the upright blocks or posts. This underpinning arrangement would also have been suitable for the bakery, since it would have meant that the walls could have been lower but still reach an eaves line of about 15 or 16 feet above the ground. With lower walls, the ground floor ceiling would have been lower in conformity with usual Company building practices.

The present writer is unable to recommend that one of these types should be favored above the other in planning the bakery reconstruction. Either would be acceptable.

3. After carefully examining the one pencil sketch and the single painting (Plates [XIV](#) and [XVI](#), Historic Structures Report, Fort Vancouver, vol. I) which depict the protruding oven section of the bakery, the present writer is still of the opinion that the brick oven complex was completely covered on the outside by a wooden shed. It is also recognized, however, that the ovens may have been covered only by a wooden shed roof, with the sides boarded in only between the roof and the top of the exterior brick oven walls.

The latter arrangement, it is admitted, would bring the dimensions of that part of the bakery lying outside the stockade into exact agreement with those shown on the generally accurate Vavasour plan of 1845. Also, no evidence of a shed was found during archeological excavations, but the ground in the oven vicinity had been disturbed by post-H.B.C. activities.

Further, it evidently was not unusual for the Company to leave its brick ovens partly or entirely exposed to the elements. [2]

Since it is impossible to give absolute preference to the visual evidence (which is so small in scale that the artists' general impressions only may be conveyed) over the arguments of logic, the present writer suggests that either method of covering the ovens would be acceptable in a reconstruction.

4. It is most probable that the ceiling of the ground floor was composed of heavy, exposed beams or joists upon which rested the floor boards of the garret. In other words, the bakery proper was not "ceiled," to use the terms of the Company's structures inventory of 1846-1847. Further, this "ceiling" undoubtedly was quite low, with the bottoms of the beams probably not more than 7-1/2 or 8 feet above the floor. In fact, the "ceiling" of the ground floor probably looked very much like that shown in Plate [CIII](#) in the Historic Structures Report, Fort Vancouver, vol. I. It is suggested that these factors be kept in mind in designing the reconstructed bakehouse.

5. At Fort Vancouver during the Company's regime there was no difficulty in obtaining massive timbers for use in construction. Therefore it can be assumed that the ceiling beams were sufficiently large and in sufficient number to span the 25-foot width without any supporting posts in the room. It is thus recommended that the floor of the bakehouse be unobstructed by posts.

6. Simple wooden racks for the storage of peels should be hung from the ceiling beams.

7. Because of the evidence of the supposed "varmint" barrier uncovered during archeological excavations and because no extensive remains of brick or stonework were discovered in front of the ovens, it seems almost certain that there was no hearth or area of stone or brick paving to provide protection from dropped embers. Yet, for reasons already discussed, it seems probable that some sort of fire-proofing was installed at that exposed location. It is known that the Company used protective sheets of metal on floors and walls near stoves, and it is suggested that similar sheathing be applied over the floor in front of the ovens.

8. Considering the need for light in the garret, it is recommended that a window be placed at each end of the gable.

9. Shingles on the roofs of H.B.C. structures were generally laid over solid, horizontal plank sheathing. It is suggested that this practice be followed in the reconstruction.

10. The shingles used at Fort Vancouver during the mid-1840's resembled modern hand-split shakes. At least some shakes used at the post during that period were 36 inches long, made of split cedar, fir, or pine. The evidence seems to indicate that this was the size ordinarily purchased from American settlers for the Company's own use as well as for sale. [3] There are indications, however, that shingles were laid with four inches exposed to the weather at Fort Vancouver, at least on the major buildings. [4] Such a practice seems hardly compatible with 36-inch shingles. It is recommended, therefore, that 36-inch shakes be used, but that they be laid with 12 or more inches exposed. This type of covering on certain buildings seems to be shown in the Coode water color of 1846-1847 (see Plates [XI](#) and [XII](#), Historic Structures Report, vol. I).

11. It is recommended that the stairs to the garret be placed at one end of the bakehouse. In keeping with usual Company practice, these stairs should be quite steep, with open treads, much like those shown in Plate [XCIV](#) in Historic Structures Report, Fort Vancouver, vol. I. If it is decided not to open the garret to visitors, these stairs should have no railing, but at the garret level the open stair well should have a protective barrier. (see Plate [XCV](#) in Historic

Structures Report, vol. I).

12. There should be a trap door in the garret floor to permit the hauling up of goods for storage. Appropriate framing should be provided to support hoisting tackle. Large butterfly hinges would be appropriate for use on the trap door. A suitable location for this door would be at about the center of the north half of the bakehouse.

13. The garret should be divided into two rooms. Probably the room with the stair well (north end of building) should be designated for storage.

14. The second garret room should be designated as living quarters. Although it is not certain that the one stove in the bakery was located in these quarters, it would be well to provide a fireproof stovepipe opening through the low east garret wall into the south oven chimney. This opening should be as close to the top of the wall as possible.

15. There is no evidence that the interior of the bakery was lined with boards. In fact, what evidence there is points to the absence of such an amenity. The 1846-1847 inventory of fort structures includes the "Bake House" in a list of work shops. One of these structures, the Saddler's Shop, is described as "lined & sided," but no comment is made about the others except for their dimensions. The implication seems to be that the bakery was not lined. It is suggested, therefore, that no interior wall finish be applied in the reconstructed building. The hewn wall timbers should be left exposed.

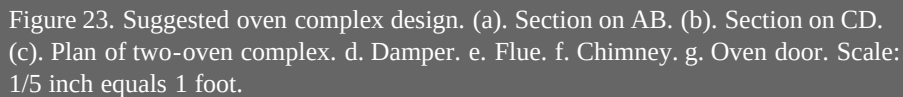
16. There is no evidence as to the style of the door to the bakery, but the doors in Company shops and stores generally were quite plain and solid. It is recommended that the door be similar to that shown in Plate [LXXXIII](#) in the Historic Structures Report, vol. I. The common color employed for gates and doors at Company posts was called Spanish brown. Paint of this color was carried in stock at Fort Vancouver, and it is recommended that it be used for the bakery door, window frames, and shutters. This color in the 1840's was more red than brown. National Heritage Limited, 322 King Street, West, Toronto, Ontario, Canada, has been in touch with British museum experts concerning the exact shade meant in the early nineteenth century by the term "Spanish brown." That organization has color samples, and it is suggested that contact be made with it so that the authentic shade may be applied.

Ovens

None of the ovens described and pictured in Chapter III of this report seems to fit exactly the few facts which are known about the ovens at Fort Vancouver or what can logically be deduced from the available data on the bakery operations. Archeological excavations have determined the size of the oven complex, and historical research has shown that the bakehouse and its equipment probably did not reflect the latest technological advances in the industry. The ovens shown in Chapter III only match in a general way the dimensions of those at Fort Vancouver, and they are, on the whole, too complicated in design.

It has seemed desirable, therefore, to recommend a rather simple type of oven, a compromise between what little is known of the typical British country oven and the more sophisticated models favored by Loudon and the U. S. Army Subsistence Department. The suggested oven is pictured in Figure 23.





The outside dimensions given in Figure 23 are established by archeological excavations, as is the general thickness of the side and rear walls. But all wall thicknesses in the diagram are merely approximate, since much depends on the size of the brick used, the amount of mortar, etc. The height of the oven arch has been based on general British practice, but most other dimensions are adapted roughly from U. S. Army specifications, except that the arch under oven has been reduced in width in conformity with British precedent. Also, since the present writer is far from being an engineer, all flue and chimney dimensions are diagrammatic only.

The main flue or chimney has been placed outside the oven door as seems to have been the most common practice of the period, but an inside flue, with damper, has been provided to reduce smoke in the room should the oven be used for demonstrations.

The ovens should be lined with fire brick, except that the floor or hearth of the baking chamber should be of tile, preferably of one of the sizes found during archeological excavations (see page 8, note 10 above). The oven door should be similar to that pictured in Figure 8.

Mr. A. Lewis Koue has pointed out that the two available pictures of the bakery (Plates [XIV](#) and [XVI](#) in [Historic Structures Report, Fort Vancouver](#), vol. I) appear to show the chimneys as being offset from the centers of the ovens. This appears to be a valid observation, but no

attempt has been made to picture such offsets in Figure 23.

Furnishings of the bakery proper

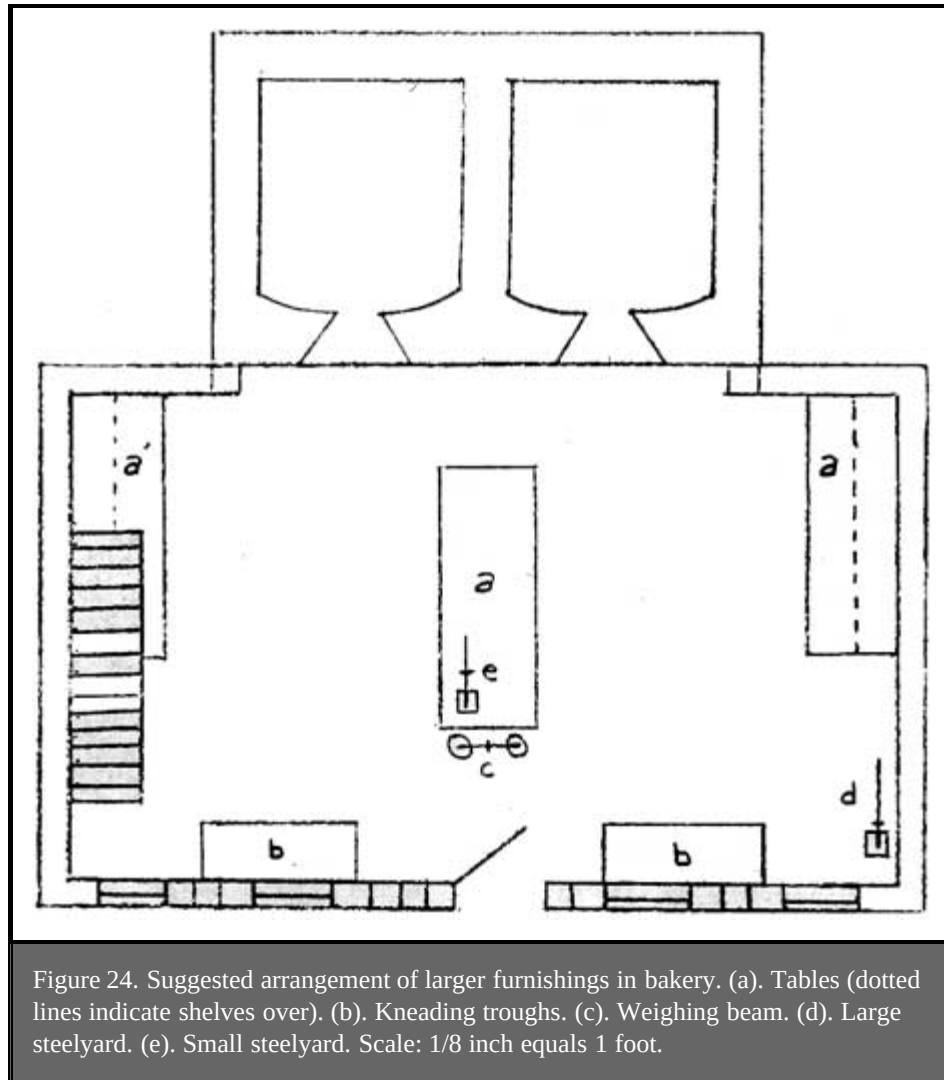
By combining the items listed in the Fort Vancouver "Bake House" inventories with those called for in the lists of "requisites" for typical English bakeries of the period, plus a few articles thrown in by the present writer as seemingly necessary, one can produce the following list of items suggested for refurnishing the ground floor of the reconstructed bakery:

- 2 large square-headed axes
- 4 biscuit stamps
- 4 plain "point" blankets — 2-1/2 points
- 1 broom
- 4 buckets (2 for water, 2 for ashes)
- 1 tin candlestick
- 1 counter brush
- 2 dippers
- 2 dough cutters
- 4 flannels
- 1 hammer
- 1 hoe
- 2 tin kettles — 8 gallon capacity
- 2 tin pans
- 6 peels (4 all wood, 2 with iron blades)
- 1 peel rack
- 1 jack plane
- 2 tin pots (one 1-pint, one 3-quart)
- 2 rasps
- 1 rooker
- 2 salt bins
- 1 saw (crosscut)
- 1 pair scales (iron weighing beam, tin pans, 1 set weights)
- 1 steelyard, 110 lbs. capacity, with weight
- 1 steelyard, 1400 lbs. capacity, with weight
- 6 tin sconces
- 2 scoops (small)
- 4 scrapers
- 2 scrub brushes
- 2 seasoning sieves or strainers
- 2 seasoning tubs
- 2 duck sheeting table cloths — 21 yards each
- 2 sets wooden shelves (over tables at sides of room, see Plates [XCVI](#) and [XCVII](#), [Historic Structures Report](#), vol. I, for type)
- 2 shovels
- 2 wire sieves
- 1 stock yeast tub
- 1 single "Canada" stove, 36 inches long [location not known]
- 1 swabber
- 3 tables (about 4 ft. wide, 12 ft. long, 2 ft. 10 in high)
- 2 kneading troughs (c. 7 ft. long, 2 ft. 10 in. high, 2-1/2 ft. wide at top, 19 in. wide at bottom, 18 in. deep, on legs)
- 2 yeast tubs

Several barrels

Arrangement of furnishings in the bakery proper

Based upon practice in British bakeries of the period, the larger pieces of furnishings may have been arranged about as shown in Figure 24. Quite possibly the weighing beam and tin scales were suspended on a rod hanging from a rafter rather than from a stand resting on the floor or a table. The peels were stored overhead on a rack suspended from the beams. Probably the broom, hoe, rooker, and swabber leaned against a post at one side of the ovens. The axes and saw perhaps were kept near the door, handy for use at the wood pile which must have been outside the bakehouse, possibly on the south side.



Several of the smaller items, such as sieves and tin pans, probably hung on nails driven into the walls. Others, such as scrapers, dough knives, and biscuit stamps, undoubtedly were scattered about on the tables. Buckets, kettles, yeast tubs, and such sizable miscellaneous items may have been kept under the tables or ranged around the walls when not in use.

Probably several flour barrels were kept on the ground floor of the bakehouse for ready use. It seems likely that they stood near the kneading troughs.

The presence of the larger of the two steelyards seems to suggest that barrels of flour and perhaps completed biscuit were weighed. This scale thus might have been suspended near the

southwest corner of the room, with several closed barrels nearby.

In refurnishing, a neat and orderly appearance should be avoided. Troughs, tables, the floor, and most utensils should show signs of hard usage. Flour dust everywhere was a characteristic feature of early nineteenth century bakeries. Above all, there should be no frills such as curtains or chairs. It seems quite likely that the oven complex showed a mixture of new and used brick.

Furnishings of the garret

In view of the uncertainties existing about the use of the bakery for living quarters, it is recommended that the garret be closed to visitors and left unfurnished pending the possible discovery of additional information. In point of fact, such a decision would improve the quality of the restoration, since compromises to provide for visitor safety could be avoided. For instance, the stairs could be steeper, and handrails would not be necessary. In Company work structures the stairways were usually not much more than large ladders.

If, however, it is considered desirable to exhibit the garret, it is recommended that the upper floor be divided into two rooms, the larger being at the north end. This north room, to which the stairs would give access, seems best suited as a place of storage. Flour barrels, extra barrels for packing biscuits, sacks of salt, etc., could be ranged in rows, while drying lumber, firewood, and other assorted materials could be used to fill up much of the rest of the space. Adequate clear passage should be allowed for access to the living quarters at the south end of the garret.

The south room could contain two sets of two rough wooden bunks placed along the north wall, one set on each side of a center door. The "Canada" stove could sit in the southeast corner, with a stovepipe leading through the wall to the southern oven chimney. A deal table on which a few cooking utensils are scattered and a couple of benches should complete the main furnishings. The "point" blankets could be placed on the two lower bunks, one blanket on each folded to form a mattress and one blanket to serve as covering. The single candlestick should be in this room if it is to be exhibited. No curtains or rugs should be in evidence. Articles of clothing and perhaps a gun or two might hang from nails on the walls. Probably a tin wash basin placed on a box and a bucket of water would suffice for ablutions.

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

Fort Vancouver

Historic Furnishings Report: Bakery



APPENDIX:

ADDITIONAL INFORMATION ON BISCUIT MAKING

The following extracts from early nineteenth century encyclopaedias were obtained after the main body of this report had been typed. They merit careful study, since they throw light upon the equipment required for producing sea biscuits during the era of hand production.

A. From article on "Biscuit (Sea)" in John Mason Good and others, Pantologia: A New Cyclopaedia . . . (12 vols., London: G. Kearsley, et al., 1813), II, pages not numbered:

. . . The process of biscuit-baking for the British navy is as follows . . . large lumps of dough, consisting merely of flour and water, are mixed up together, and as the quantity is so immense as to preclude by any common process a possibility of kneading it, a man manages, or, as it is termed, rides a machine which is called a horse. This machine is a long roller, apparently about four or five inches in diameter, and about seven or eight feet in length. It has a play to a certain extension, by means of a staple in the wall, to which is inserted a kind of eye, making its action like the machine by which they cut chaff for horses. The lump of dough being placed exactly in the centre of a raised platform, the man sits upon the end of the machine, and literally rides up and down throughout its whole circular direction, till the dough is equally indented; and this is repeated till it is sufficiently kneaded, at which times, by the different positions of the lines, large or small circles are described, according as they are near to or distant from the wall.

The dough in this state is handed over to a second workman, who slices it with a prodigious knife; and it is then in a proper state for the use of those bakers who attend the oven. These are five in number; and their different departments are as well calculated for expedition and correctness as the making of pins, or other mechanical employments. On each side of a large table, where the dough is laid, stands a workman; at a small table near the oven stands another; a fourth stands by the side of the oven to receive the bread; and a fifth to supply the peel. By this arrangement the oven is regularly filled, and the whole exercise performed in as exact time, as a military evolution. The man on the further side of the large table moulds the dough, having previously formed it into small pieces, till it has the appearance of muffins, although rather thinner, and which he does two together, with each hand; and as fast as he accomplishes this task, he delivers his work over to the man on the other side of the table, who stamps them with a docker on both sides with a mark. As he rids himself of this work, he throws the biscuits on the smaller table next the oven, where stands the third workman, whose business is merely to separate the different pieces into two, and place them immediately under the hand of him who supplies the oven, whose work of throwing, or rather chucking the bread upon the peel, must be so exact, that if he looked round for a single moment, it is impossible he should perform it correctly. The fifth receives the biscuit on the peel, and arranges it in the oven; in which

duty he is so very expert, that though the different pieces are thrown at the rate of seventy in a minute, the peel is always disengaged in time to receive them separately.

As the oven stands open during the whole time of filling it, the biscuits first thrown in would be first baked, were there not some counteraction to such an inconvenience. The remedy lies in the ingenuity of the man who forms the pieces of dough, and who, by imperceptible degrees, proportionably diminishes their size till the loss of that time, which is taken up during the filling of the oven, has no more effect to the disadvantage of one of the biscuits than to another.

So much critical exactness and neat activity occur in the exercise of this labour, that it is difficult to decide whether the palm of excellence is due to the moulder, the marker, the splitter, the chucker, or the depositor; all of them, like the wheels of a machine, seeming to be activated by the same principle. The business is to deposit in the oven seventy biscuits in a minute; and this is accomplished with the regularity of a clock; the clack of the peel, during its motion in the oven, operating like a pendulum.

This same article, evidently word for word, is to be found in William Nicholson, The British Encyclopedia, a Dictionary of Arts and Sciences . . . (6 vols., London: Longman, Hurst, Rees, and Oreme, 1809), I, article on "Biscuit, sea." It is thus evident that the process described by Good was in use at least as early as 1809. Under this method the biscuits, upon being removed from the oven, were placed in drying lofts over the ovens until considered dry enough to be packed in bags of a hundredweight each and sent into storehouses. The ovens of the victualing office at Plymouth were heated 20 times a day.

B. From article on "Baker" in G. Gregory, A New and Complete Dictionary of Arts and Sciences . . . (1st American ed., 3 vols., Philadelphia: Isaac Peirce, 1316), I, pages not numbered.

The process of biscuit baking, as practiced at the victualling office at Deptford, is curious and interesting. The dough, which consists of flour and water only, is worked by a large machine. It is then handed over to a second workman, who slices it with a large knife for the bakers, of whom there are five. The first, or the moulder, forms the biscuits two at a time; the second, or the marker, stamps and throws them to the splitter, who separates the two pieces, and puts them under the hand of the chucker, the man that supplies the oven, whose work of throwing the bread on the peel must be so exact, that he cannot look off for a moment. The fifth, or the depositor, receives the biscuits on the peel and arranges them in the oven. All the men work with the greatest exactness, and are, in truth, like parts of the same machine. The business is to deposit in the oven seventy biscuits a minute

C. From article on "Biscuitemaking" in The Edinburgh Encyclopaedia . . . (1st American ed., 18 vols., Philadelphia: Joseph and Edward Parks, 1832), III, 520.

As the process of making biscuits for the navy is rather curious, we shall endeavour to lay before our readers a very short account of it. After the meal and water are combined into large lumps of dough, it is kneaded by means of a machine, which consists of a roller, about six inches in diameter, and seven feet long. One of its extremities is fixed into the wall, so as to have a certain degree of play, while a man rides, as it were, on its other end. The lump of dough is then placed below it, and the man puts the roller into action, till the dough is

sufficiently kneaded. In this state it is given to a second workman, who slices it with a large knife, for the use of the bakers who attend the oven. The rest of the process is effected by four [sic] workmen, two of whom take their station, each at the end of a large table that holds the dough; the third stands at a small table near the oven; the fourth stands at the oven, and the fifth supplies the peel. The dough is then moulded into something like muffins by the person on the farther side of the larger table. He then throws them to the man at the other end of the table, who puts the proper stamp upon them, and throws them upon the small table, where the third workman separates the different pieces into two, and places them under the hand of the fourth baker, who throws the bread upon the peel. The fifth workman recives the biscuits on the peel, and arranges them in the oven. All these successive operations are performed with such activity and exactness, that seventy biscuits are thrown in during a single minute. It is evident, that the biscuit first thrown into the oven would be baked sooner than the others; but this effect is obviated by the workman who moulds the dough, and who proportionally diminishes the size of the biscuits; so that those which are last thrown in require less heat than the others. The biscuits thus made are placed in drying lofts above the oven, and are afterwards packed into bags, of one hundredweight each and removed to the warehouses.

D. From article on "Biscuit" in The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge (27 vols., London: Charles Knight, 1833-1843), IV [1835], 452

. . . . at Deptford Meal and water being mixed together in proportions necessary for giving the due degree of consistency to the dough, it is kneaded in the following manner: — The dough is placed upon a wooden platform, about six feet square, fixed horizontally a few inches above the floor of the bakehouse, and against the wall. A wooden roller, or staff, five inches in diameter, and eight feet long, has one end fixed by means of a staple and eye to the wall, at a convenient distance, at the middle of that side which is against the wall, above the level of the platform, and its other end overhangs by two feet the outer edge of the platform. Having a certain play by means of the staple and eye, this roller can be made to traverse the surface of the platform, and when the dough is placed upon it, the roller is used so as to knead it by indenting upon it lines radiating in a semicircle from the staple. To perform this kneading process, a man seats himself upon the overhanging end of the roller and proceeds with a riding motion backwards and forwards through the semicircular range until the dough is sufficiently kneaded.

In this state the dough is cut by large knives into slices, which are subdivided into small lumps, each sufficient for making a biscuit. In moulding these lumps, which is done by hand, the dough undergoes a further degree of kneading, and at length receives the form of a biscuit. The men who thus fashion the dough make two of these cakes at the same time, working with each hand independently of the other. When this part of the work is completed, the two pieces which have been simultaneously prepared are placed one on the other and handed over to another workman, by whom the two together are stamped with a toothed instrument, the use of which is to allow the equable dissipation of moisture through the holes from all parts of the biscuit during baking. The biscuits are then separated by another workman, who places them on a particular spot of a small table standing close to the mouth of the oven, so that each biscuit can be taken up in its turn without the necessity of his looking for it, by the man who supplies the oven. The office performed by this man is that of chucking the biscuits in succession upon the peel, which is held by another man whose

business is to arrange them in the oven. This peel is a flat thin board, a few inches square which can, by means of a long handle, be slidden over the floor of the oven, so as to deposit and arrange the biscuits thereon The oven is . . . supplied at the rate of seventy biscuits a minute.

E. From article on "Manufacture of Biscuits" in Encyclopaedia Metropolitana; or, Universal Dictionary of Knowledge . . . (29 vols., London: B. Fellowes, et> al., 1845), VIII, 801-802.

. . . While the steam-engine and machinery have been introduced in almost every other Art, that of biscuit-making has, till very lately, been performed by hand. So recently as the year 1833, the first application of these means has been had recourse to for this purpose at present our object is to explain the manual process, which, is extremely curious. This process is of course somewhat, but very little, different in its minutiae in different offices [of his (sic) Majesty's Victualling Office]; we shall confine our description to that followed in his Majesty's Victualling Office, Deptford. The corn [wheat] is received from the markets, and is cleaned, ground, and dressed The flour used in the manufacture of biscuit for the Royal Navy consists of a mixture of flour and middlings, or it is the flour which remains after the pollard and bran only have been extracted, the corn being highly dried before it is ground. The baking establishment consists of two long buildings . . . with six ovens in each The kneading troughs and kneading boards, or breaks, are arranged round the outside walls of the building, one opposite each separate oven. The ovens are all wrought iron The furnaces, which are on the sides of the ovens, are also of iron, and are heated by a powerful Welsh coal, which gives out a strong flame, and is conducted all round the oven. The number of men required to work each oven is five; these form a gang, and are denominated the furner, furner's mate, the driver, breaker, and idleman.

Process. — The first operation is that of kneading, in which there is nothing remarkable. The proper quantity of flour is put into a trough, furnished with a cock for a supply of water, and here it is kneaded by the driver with his naked arms till it assumes the rough form of dough. In this state it is removed from the trough and deposited on a strong wooden platform or table, called a break, to be operated upon by the breaksman, who, seizes a strong lever called a break-staff, with which he presses down the dough, sits with his weight upon it, and, with a rapid jumping and most uncouth motion, carries the lever over the whole surface. It is then transferred to the moulding board, a strong table near the mouth of the oven. Here it is cut into slips, and divided into lumps of the proper size for a biscuit. It is then moulded by the hands into its circular shape, laid in pairs one on the other, and subsequently docked, that is pierced with holes by an instrument called a docker; this stamp contains also the number of the oven, D for Deptford, and the usual King's mark. This number and the initial of the yard are specified, in order that, if any defect should be observed in the bread, it may be known where the fault rests. The biscuits, being stamped, are thrown six or eight at a time upon another table nearer the oven's mouth, where are placed the other three men, one called the furner, another the furner's mate, and the third the idleman, who separates the double biscuit, hands them singly to the furner's mate, who, with great dexterity, and even with elegance, pitches them into the oven upon the peel, handled with equal dexterity by the furner, who places the biscuits as he receives them side by side throughout the whole area of the oven, drawing back his peel a short distance each time to receive the next biscuit. The speed and facility with which this process is carried on are very striking to the eye of a stranger. It of course varies a little, but frequently more than one

hundred biscuits are thus pitched in and properly placed in a minute. It may be observed that, with the greatest dexterity, those biscuits first placed in the oven must be the most baked; and to equalize this unequal effect the first are made larger than the others, so that the heat may be proportionally distributed; the oven, being filled, is closed for about ten minutes, when it is again opened and the biscuits withdrawn. During the time the oven is closed, and while the bread is being withdrawn, the process of kneading is going forward by the men not employed at the oven, to be ready to commence again as soon as it is empty.

The quantity baked each time, which is called a suit, is about 112 pounds weight before being placed in the oven, and which comes out 100 pounds, about 9 per cent. of weight being lost in the process. The number in this weight of biscuit is about five hundred and eighty, that is one with another; there are about six biscuits to a pound. . . .

The usual number of suits which each oven bakes in a day is twelve, and on extra occasions they can bake sixteen or seventeen On a stranger entering the door . . . he is struck with the perfect order and dexterity of the six divisions of the men, each attired in a clean checked shirt, white linen trowsers, apron, and cap, and all plying their several avocations with a steady rapidity, but without noise or the slightest appearance of hurry or confusion.

<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

fova/hfr1/hfra.htm
Last Updated: 28-Nov-2005

Fort Vancouver

Historic Furnishings Report: Bakery



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<<< [Previous](#)

<<< [Contents](#) >>>

[Next](#) >>>

fova/hfr1/hfrb.htm
Last Updated: 28-Nov-2005

Fort Vancouver

Historic Furnishings Report: Bakery



PLATES



Plate I. Contents of a cache of 1853 left by Captain Henry Kellett, R. N., on Dealy Island, Northwest Passage. The biscuit, stamped with the royal broad arrow, matches exactly the description of those turned out for the Royal Navy in 1851 by the victualing office at Weovil in the south of England. Although stamped out by machine, this biscuit undoubtedly resembles in size and general appearance the former round biscuits produced by hand stamping prior to the mechanization of the industry. *(Photograph courtesy of Mr. Wayne Colwell, Curator, Canadian National Historic Sites Service.)*



Plate II. "Old bake oven" in one of the bastions at Lower Fort Garry, Manitoba, in 1935. Unfortunately additional data concerning this photograph are not available. *(Courtesy of Library, Hudson's Bay Company, Winnipeg; reproduced with permission of the Hudson's Bay Company.)*



Plate III. Reconstructed H.B.C. bake ovens in Northwest Bastion, Lower Fort Garry, originally built c. 1846-1848. The doors to these ovens are only 24 inches above the floor. One chimney serves both ovens. (*National Park Service photograph by A. L. Koue, September, 1967.*)



Plate IV. Oven entrance details, Northwest Bastion, Lower Fort Garry. The vaulted ceiling of the baking chamber is 3'3" high at the top of the arch. (*National Park Service photograph by A. L. Koue, September, 1967.*)

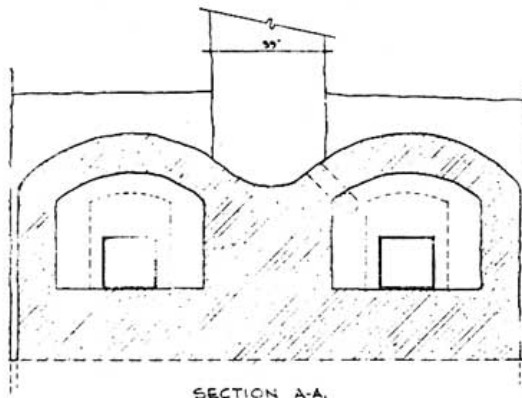
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Last Updated: 28-Nov-2005



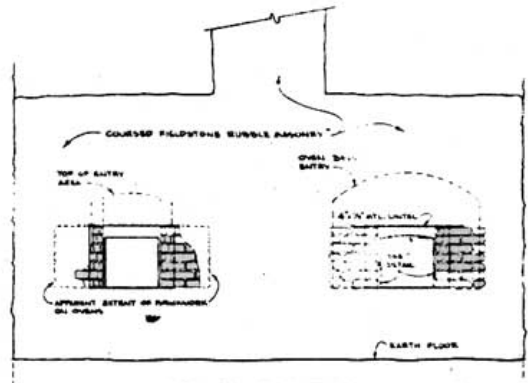




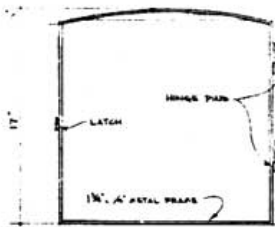




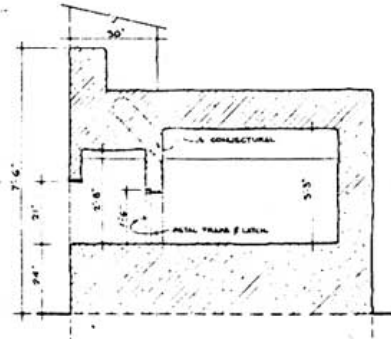
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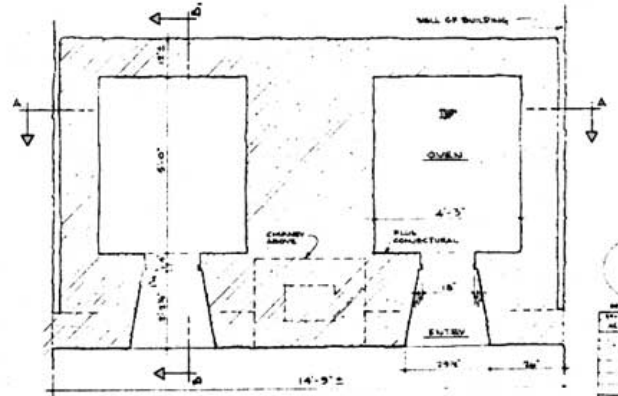
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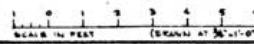
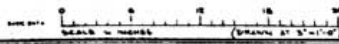
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SECTION B-B
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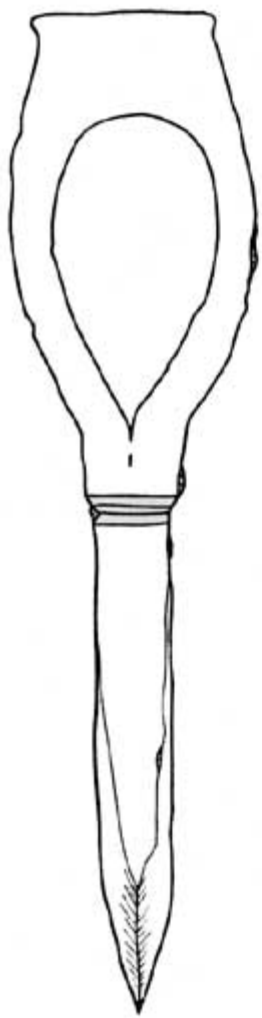
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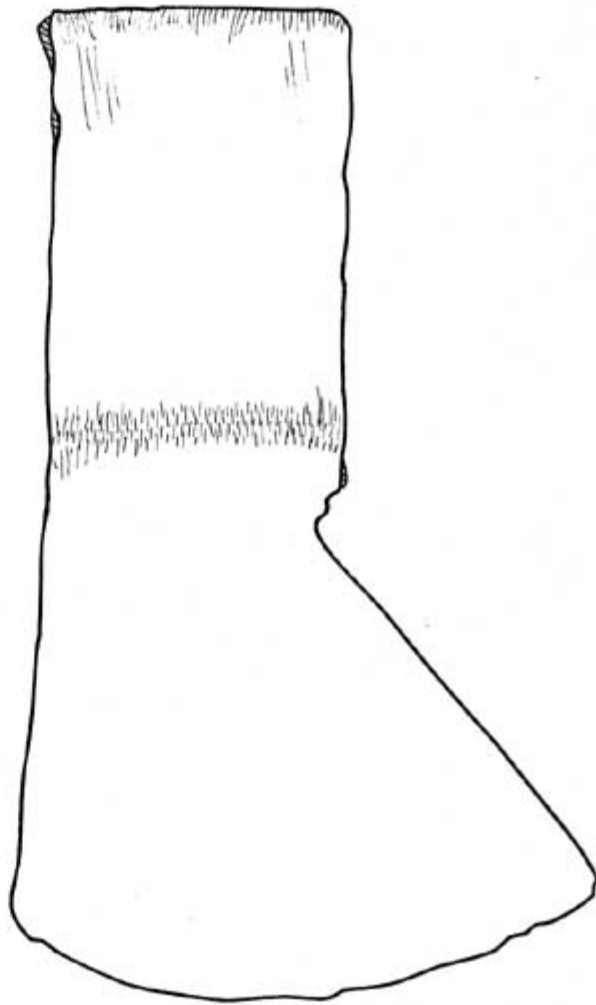
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OFFICE OF ARCHITECTURAL & ENGINEERING REGULATION	
BRANCH OF REGISTRATION, INC.	
BUREAU OF OVEN	
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CHECKED BY	
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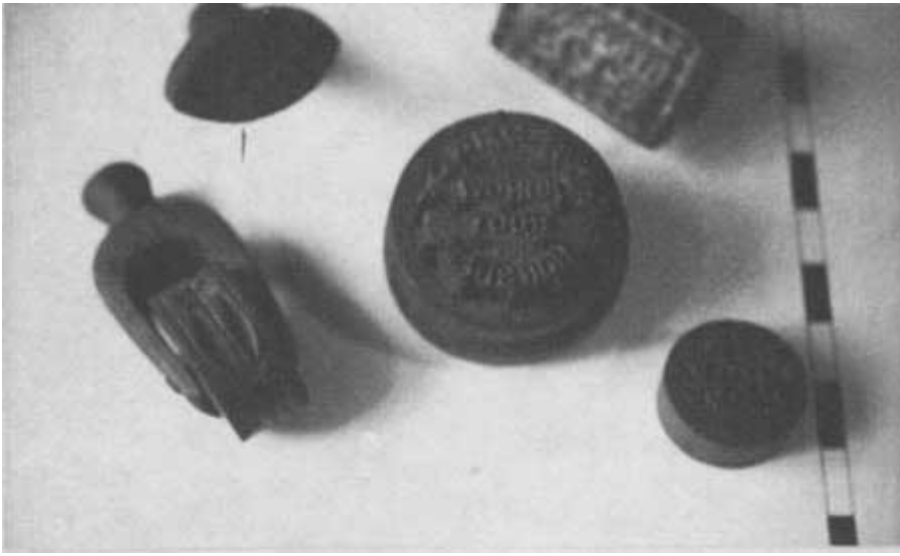


END VIEW

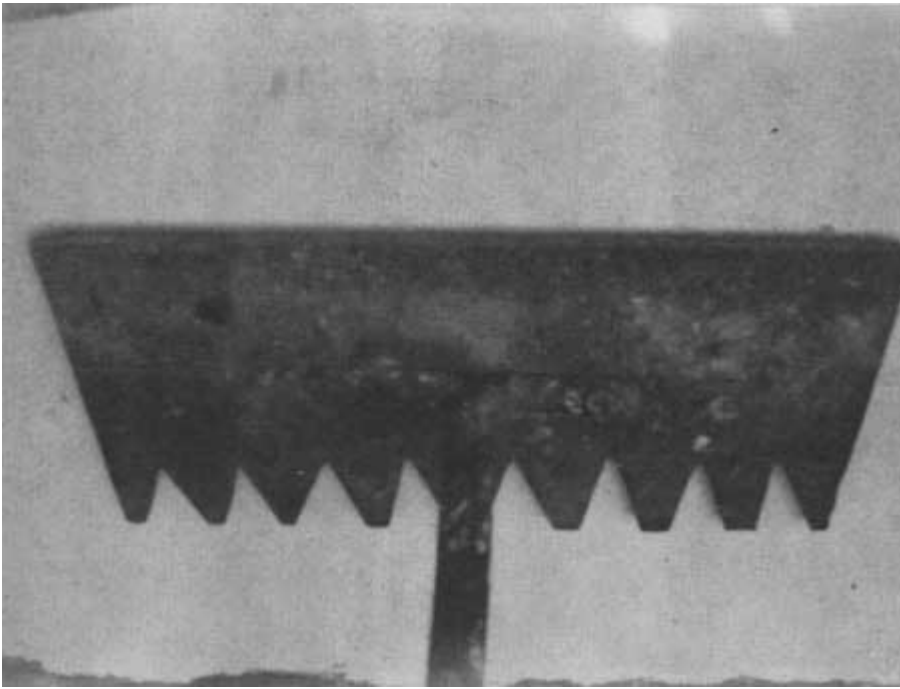


SIDE VIEW

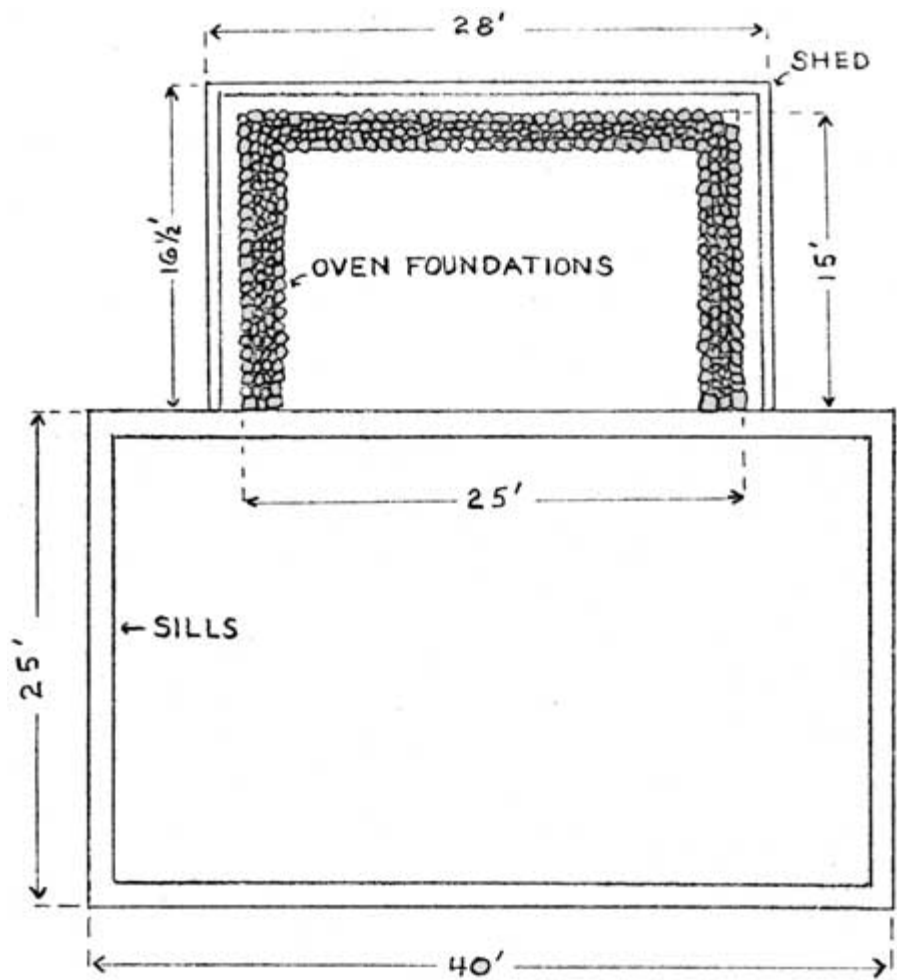






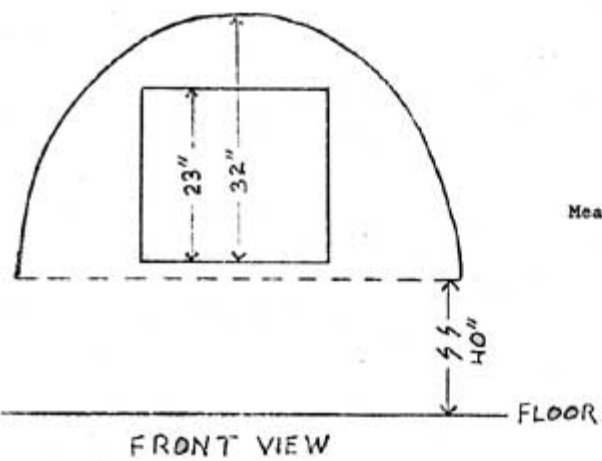
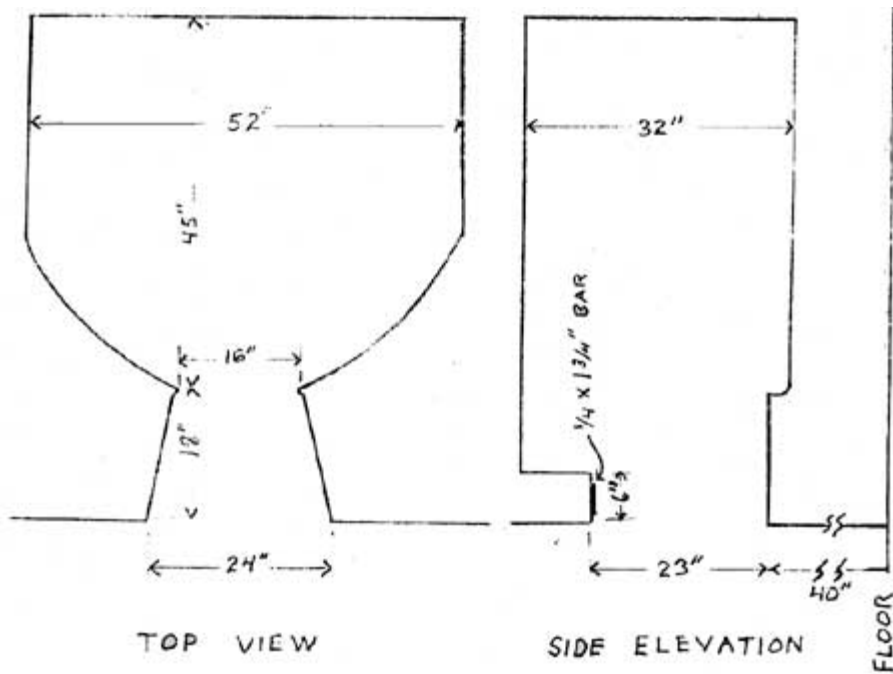












BAKERY IN STABLE
LOWER FORT GARRY

Measurements by A. L. Koue



fig. 2 .

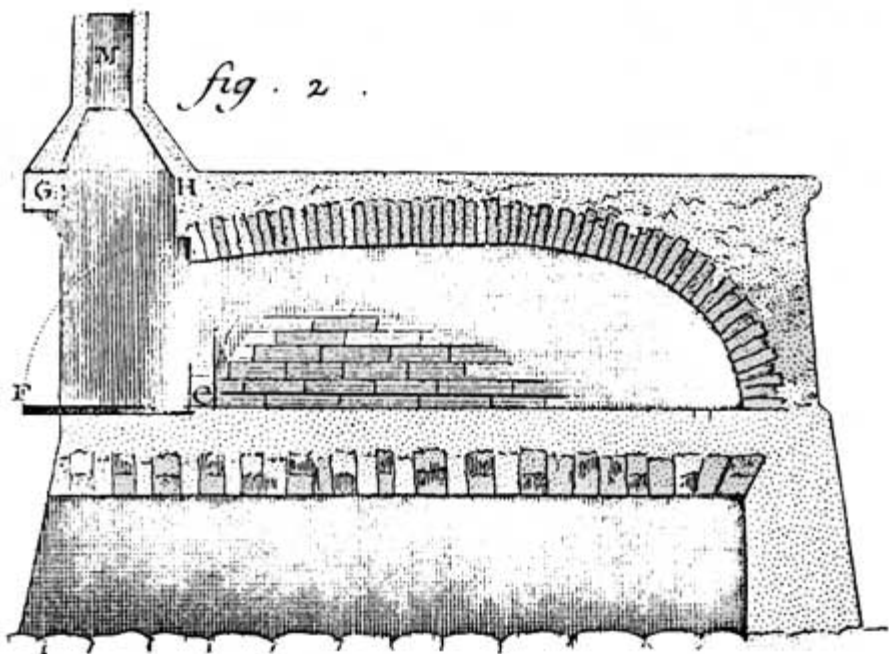


fig. 1 .

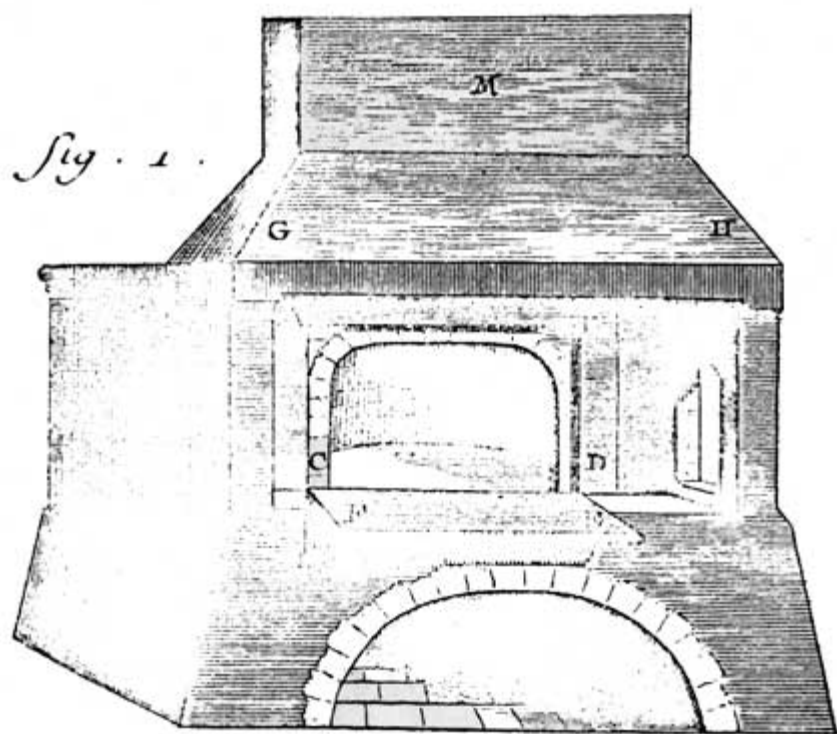


Fig. 69.

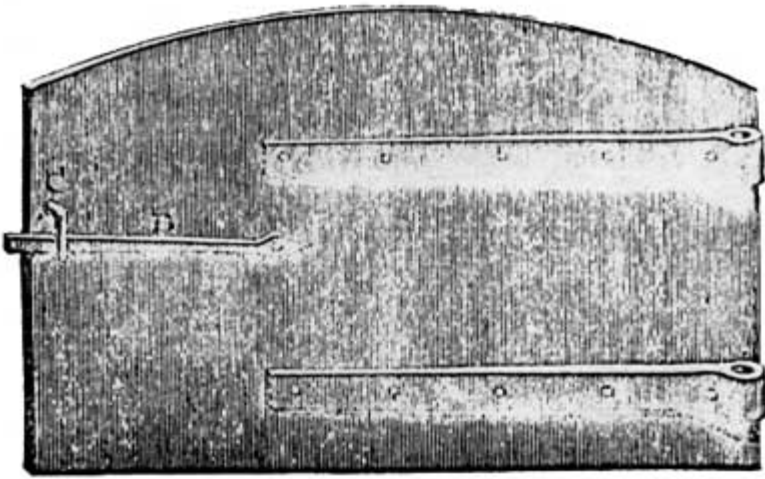


Fig. 67.

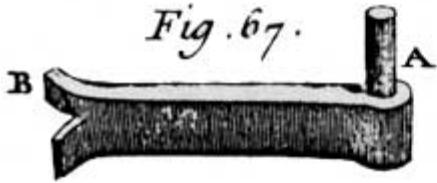


Fig. 66.

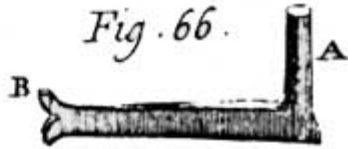


Fig. 1.

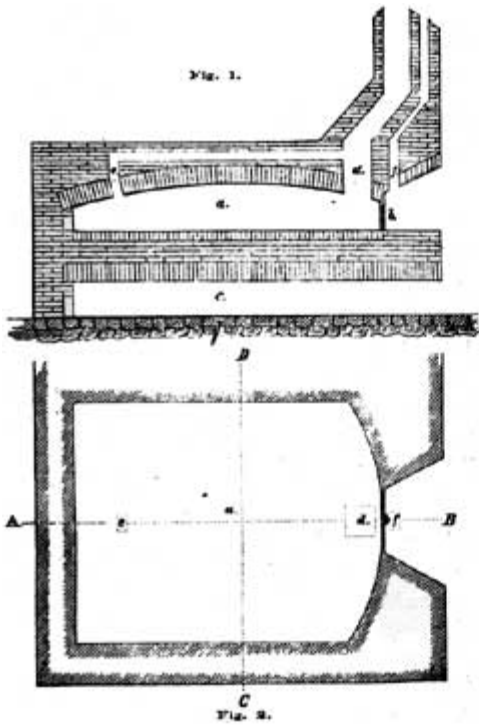


Fig. 2.

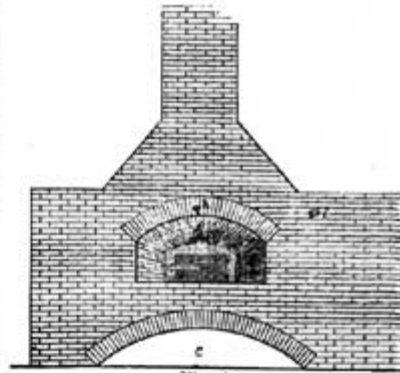
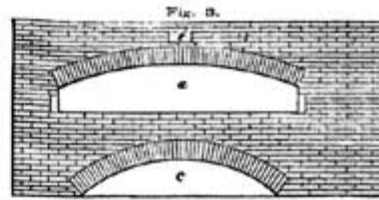


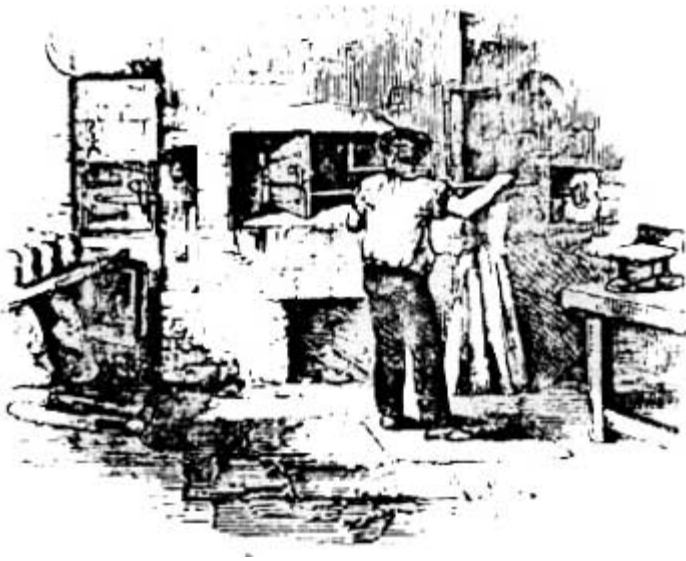
Fig. 4.

SCALE, 6 FEET TO 1 INCH, OR LARGER.

- Fig. 1.—Section as A B.
 Figure 2.—Plan of Road Oven.
 Figure 3.—Section as C D.
 Figure 4.—Front of Road Oven.
- a.—Body of Oven.
 A.—Oven Door.
- c.—Lip of
 d.—Main Flue.
 e.—Back Flue.
 f.—Rear Flue.
 g.—Foundation.
 h.—Chimney for Main Flue.
 i.—Chimney for Back Flue.



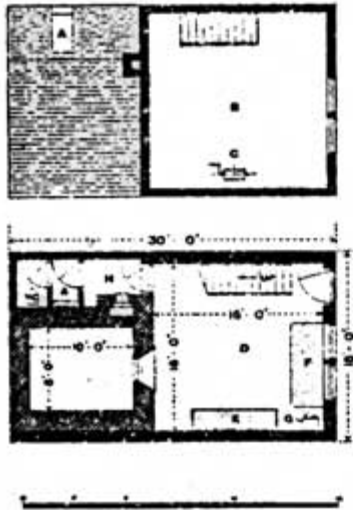




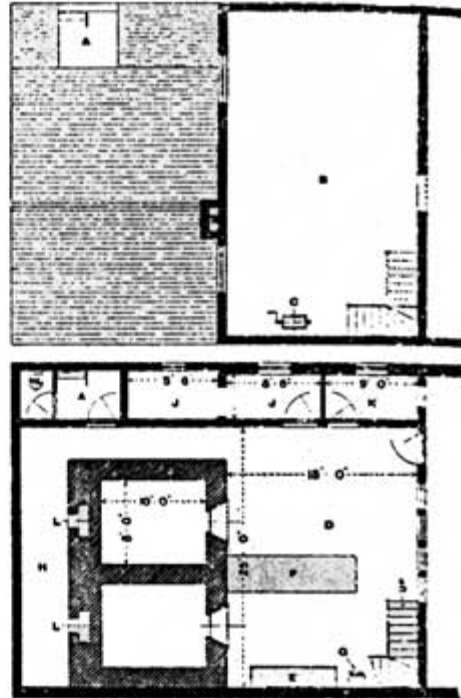


PLANS OF BAKEHOUSES.

WITH ONE PEEL OVEN.

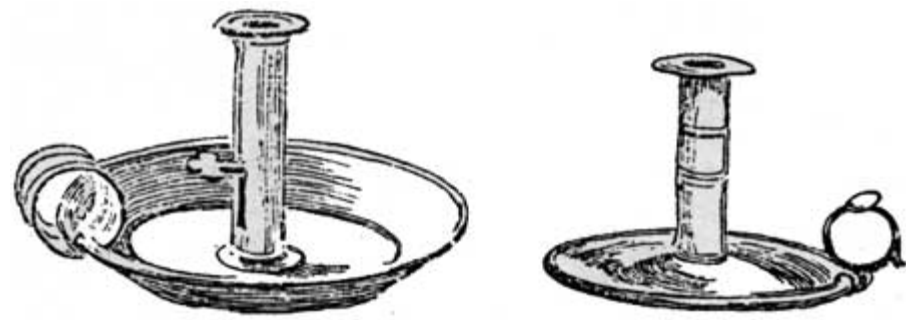


WITH TWO PEEL OVENS.

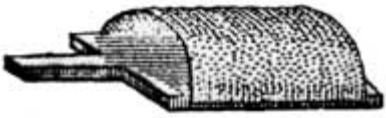


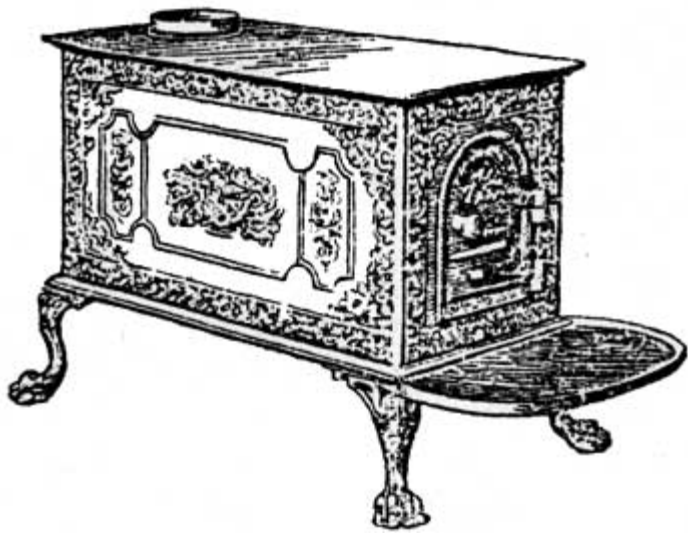
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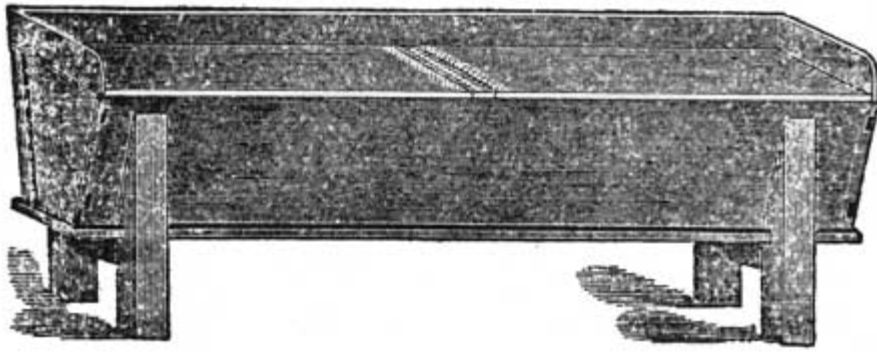
- A. Open Yard.
- B. Flour Store.
- C. Sifter and Shoot.
- D. Bakehouse.
- E. Dough Trough.
- F. Moulding Table.
- G. Tempering Tank.
- H. Stoke-hole.
- J. Confectionery and Stores.
- K. Office.
- L. Furnaces.

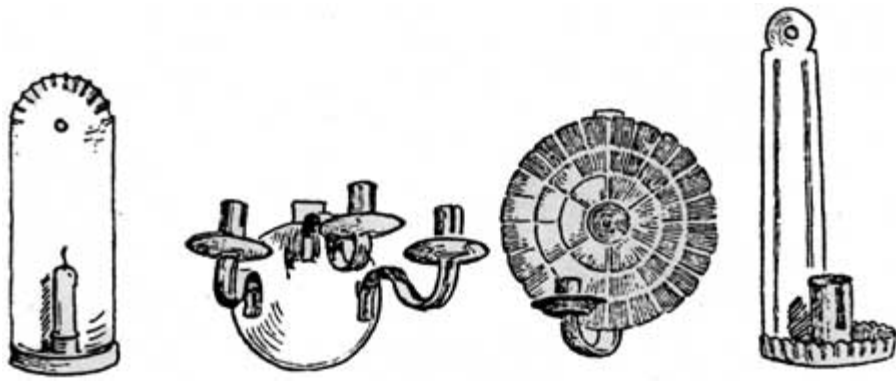


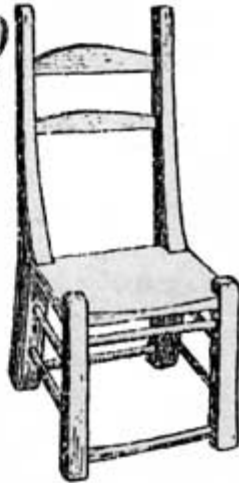
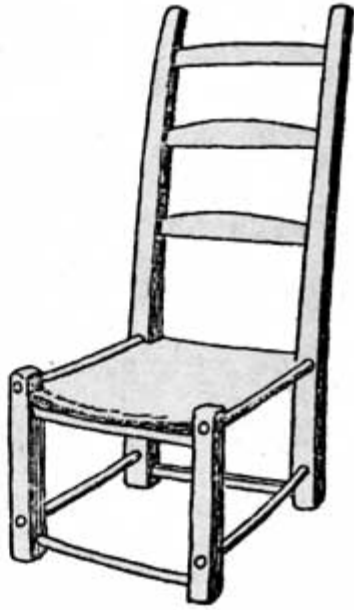
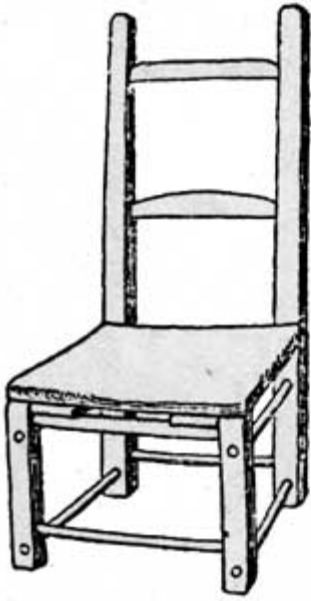












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