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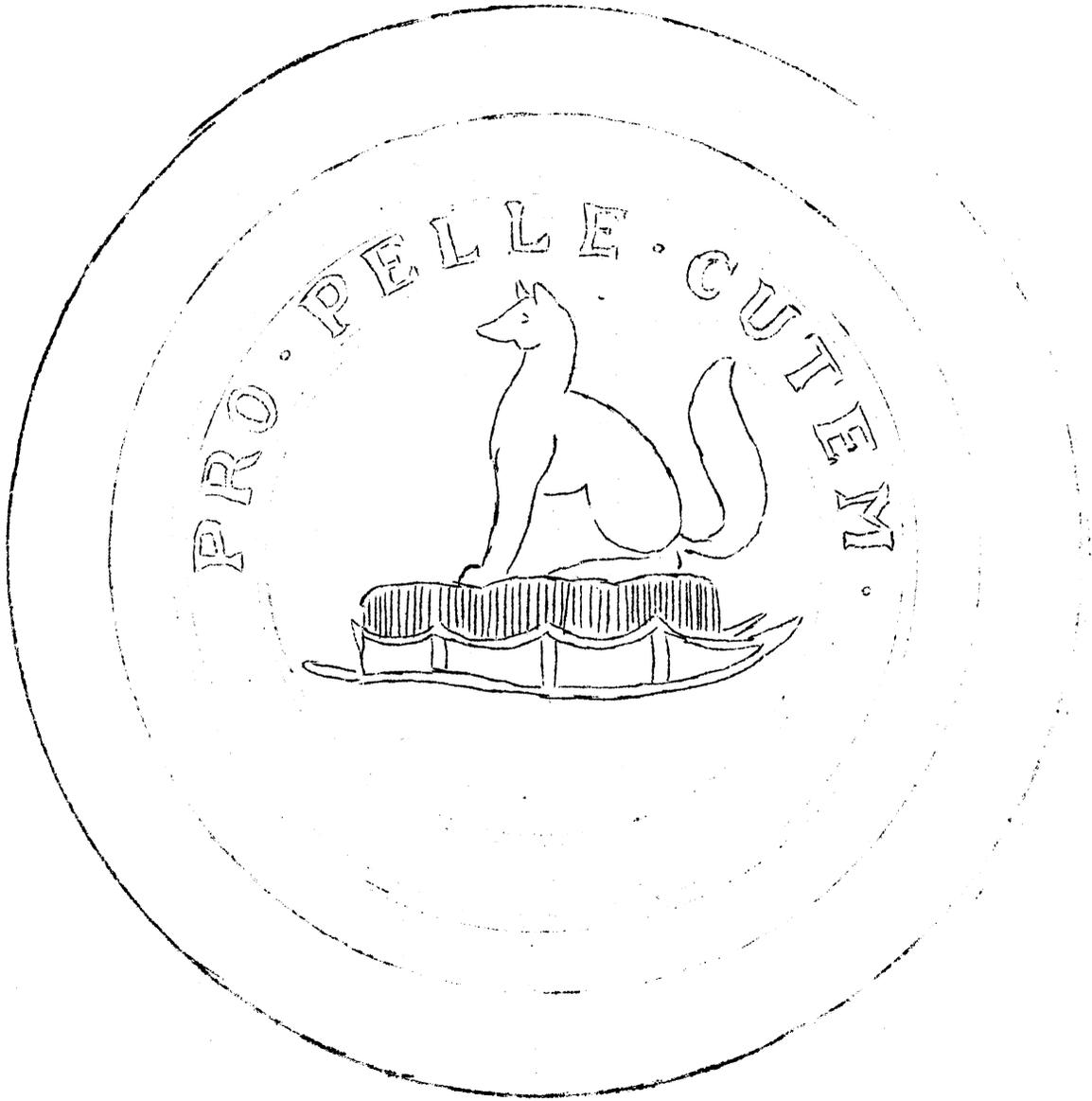
FINAL REPORT
FORT VANCOUVER EXCAVATIONS

by
LOUIS R. CAYWOOD
Archeologist

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HUDSON'S BAY COMPANY LEAD SEAL (Enlarged 6X)

BLAZON OF THE HUDSON'S BAY COMPANY'S ARMS

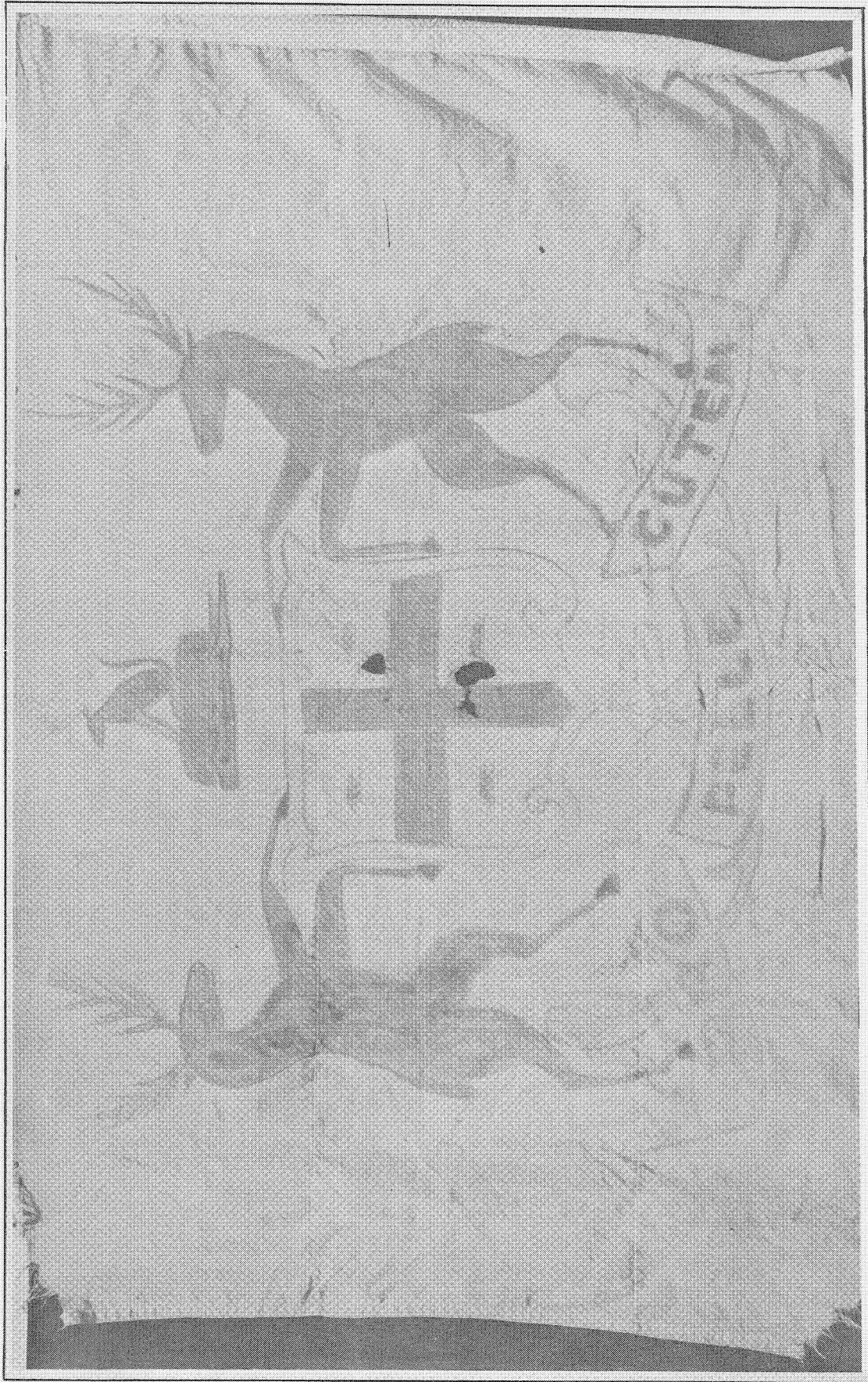
Argent a cross gules between four beavers sable.

Crest upon a cap of maintenance gules turned up ermine,
a fox sejant proper.

Supporters on either side, an elk proper.

Motto, Pro pelle cutem.

Frontispiece



Flag from Fort Vancouver showing the blazon of the Hudson's Bay Company's arms.

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P R E F A C E

This report embodies the results of an archeological study of the site of the Hudson's Bay Company trading post of Fort Vancouver on the Columbia River in the present State of Washington. From the beginning of the work in 1947 until the final shovelful of earth was replaced over the historic site in 1952 many individuals and institutions helped greatly with the problems encountered during the excavations.

The author wishes to express his appreciation to those in the National Park Service for their complete cooperation in contributing to the success of the project. Special thanks go to Doctors V. Aubrey Neasham and John A. Hussey for historical documentation of the site.

Identifications of the thousands of objects found during the Fort Vancouver excavations and continued help in this field were made possible through the courtesy of many individuals and institutions as follows:

Animal Trap Company of America, Lititz, Pa.
Copeland & Thompson, Inc., N. Y., and W. T. Copeland & Sons Ltd.,
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Individuals in Vancouver, Washington, and Portland, Oregon, were most helpful during the progress of the excavations, and their aid has been appreciated. Special thanks go to Miss Eve Santee, Librarian, Fort Vancouver Memorial Library; Mr. Howard Burnham, Mr. Donald Stewart, Dr. Burt Brown Barker, Mr. Carl Landerholm, Mrs. Germany Klemm Prose, and Mr. H. G. Richardson for their continued help in furnishing information, references, maps, sketches and other aids necessary to produce a worthwhile report.

I N T R O D U C T I O N

Establishment of Fort Vancouver National Monument was authorized by Public Law 715, approved by President Truman on June 19, 1948, which provided for setting aside not more than ninety acres as a historic area to commemorate the story of the fur trade west of the Rocky Mountains. Actual establishment was accomplished by Secretarial Order published in the Federal Register of July 9, 1954.

The archeological exploration of Fort Vancouver was undertaken as a result of a Congressional conference committee report which requested that \$7,500 of the National Park Service appropriation for physical improvements for the fiscal year 1948 be utilized for that purpose. Under this authority the Service laid out plans for the work and the author was assigned to supervise the excavations which began on September 17, 1947.

The principal reason for the preliminary excavations was to locate the fort in order that a boundary study could be made to establish a national monument of the site. The second reason was to locate the buildings within the stockade. Thirdly, the study of the artifacts recovered would provide knowledge concerning life at Fort Vancouver during the fur-trading period -- knowledge needed for the proper development and interpretation of the proposed national monument.

Fort Vancouver was founded by the Hudson's Bay Company during the winter of 1824-1825 as a fur-trading post and supply depot. It was located on the north bank of the Columbia River about one hundred miles from the Pacific Ocean and could be reached by sea-going vessels. The new establishment was christened by no other personage than George Simpson himself in March 1825, when he broke a bottle of rum on the flagstaff. During the winter of 1828-1829 it was decided to move from the bluff overlooking the river, where today the Washington State School for the Deaf is located, to the plain below known as "la Jolie Prairie." It was at this location that Jedediah Smith mentions the construction of a new fort during the winter of 1828-1829.

As the headquarters for the vast territory controlled by the Hudson's Bay Company in the Pacific Northwest, Fort Vancouver became an important establishment in the building of the Pacific Northwest. Overseas shipping was the lifeblood of the newly established outpost. The Company soon realized that not only were fur returns to be gotten from the interior but from coastal trade as well. Competition in the maritime trade by Yankee traders was rapidly and successfully met by Dr. John McLoughlin, Chief Factor, through the use of the annual supply ship. He attempted the construction, at Fort Vancouver, of two small wooden vessels, but this project was not too successful due to shortage of iron and lack of well-seasoned wood. From that time on ships were purchased wherever available or requisitioned from England. In order that a sufficient reserve could be maintained, it was planned that supplies were to be sent to the Columbia a full year in advance.

Famous names have tied this western emporium of the fur trade to the pages of history. Our story begins after the coalition of the Northwest Company and the Hudson's Bay Company in 1821. Of all those who worked in this area, the name appearing most often in poetry, fiction, and history has been that of Dr. John McLoughlin, the "White-headed Eagle." Peter Skene Ogden, John Work, and James Douglas arrived on the Columbia as clerks and became in later years the most prominent of all McLoughlin's subordinates. All four spent the rest of their busy lives on the west side of the Rocky Mountains as important members of society.

The chief competitors for the coastal fur trade previous to 1824 were the Russians and the Americans. The Russians and the British, however, had much in common in that they were seeking to exploit the fur resources by both ships and trading posts. The Yankee trading vessels were usually merely birds of passage intent on getting the best furs, for which they traded guns, ammunition and liquor. It is true, however, that attempts were made by Americans to set up establishments. The first was in 1811 when Astor's Pacific Fur Company established Fort Astor at the mouth of the Columbia River with a number of interior posts. However, because of war with England these were sold to the North West Company, marking Astor's withdrawal from this section of the continent. Other Americans tried to break into the fur trade but without success. Nathaniel Wyeth in 1834-5 set up an establishment on Wapato, now Sauvies Island, known as Fort William, which was doomed to failure. ^{1/} However, in 1834 Wyeth did build a post on the Snake River which was called Fort Hall. This was sold to the Hudson's Bay Company in 1837. ^{2/} This was only part of a cycle by which American traders linked New England with the Sandwich Islands and China. In 1829 and 1830 two American ships spent considerable time trading along the Columbia River competing with the Company for furs, much to McLoughlin's annoyance. These were the years the Company's supply ships William and Ann and Isabella were lost on the bar of the Columbia. The Hudson's Bay Company was forced to lower prices on its trade goods but weathered the competition successfully in spite of being low on goods. These, briefly, were just a few of the problems with which McLoughlin had to contend. The years passed until 1836, when the Whitmans and Spaldings visited the fort; and their account of the activities of the farm, the sawmill and grist mill, the herds, the dairy, the stores, school, and the ships in port describes the progress made at the establishment.

By 1845 the press of American immigration into the Oregon country made the British apprehensive of losing the territory. A two-man survey crew, Lieutenants Henry J. Warre and M. Vavasour, visited the fort and made a splendid report on their observations; with suggestions for better defense in case of possible trouble with the American settlers.

^{1/} Bancroft, History of the Northwest Coast, I, 491.

^{2/} Chittenden, History of the American Fur Trade, I, 455.

The next fifteen years saw many changes in the fort. It continued as a fur trading post and retail store but its days were numbered, and in June 1860 it was closed by the removal of all personnel to Fort Victoria on Vancouver Island.

During the beginning years of the development of Fort Vancouver, say from 1825 to 1830, the fur trade business was on a relatively small scale. Most of the goods, supplies, and even the food came by ship from London. During the next few years more and more trade goods, merchandise, and especially stock iron were shipped from England to care for the expanding needs of the new business. The development of agriculture, dairying, and cattle raising in the fertile Cowlitz and Columbia River valleys soon made it almost unnecessary to import food supplies, and the tide turned with surpluses of salmon, wheat and dairy supplies being shipped to San Francisco, Sitka, and even the Sandwich Islands. At Fort Vancouver was established the first of a series of great farms which the Hudson's Bay Company and its subsidiary, the Puget's Sound Agricultural Company, maintained throughout the Northwest. Here were lumber mills, flour mills, salmon-drying houses, a shipyard, and shops for blacksmiths, coopers, carpenters, and many other artisans. Because it possessed the only adequate supplies of seed and farm animals, and because it was practically the only market for the produce raised by settlers, the Hudson's Bay Company, chiefly through Fort Vancouver, controlled the economic life of the Oregon Country for many years. At Fort Vancouver also centered much of the social and cultural life of the region. Here were established the first school, the first circulating library, the first theater, the first museum, and here were some of the earliest churches in the Northwest. Officers of the Company were the only recognized civil administrators for many years in this vast territory.

The Hudson's Bay Company at first had supplied only the needs of its own fur trade. Later, as westward expansion began and the fur trade dropped off, the Company began to act as a retail institution to the settlers in the Willamette Valley and to the U. S. Army at Vancouver.

Sir George Simpson's policy of providing all necessary items for the fur trade from resources and industry in America soon led to the beginning of many new industries in eastern Canada and even in the American seaboard states. At a time when westward migration was beginning, the eastern areas were growing industrially to supply the ever increasing wants of the westward moving population.

THE SETTING

Fort Vancouver was built on an open section of land along the north bank of the Columbia River surrounded by a forest of Douglas fir. This land, known also as Fort Plain, contained some of the fields and the orchard belonging to the fort. Adjacent and down river was the small village called Kanaka town and occupied exclusively by the servants of the Hudson's Bay Company, which was the beginning of the present City of Vancouver. Two small lakes on the plain supplied some of the waterfowl used on the tables of the gentlemen. Warre reports that snipe shooting was good and that the number of swans, geese, ducks and pigeons was incredible. 3/

In 1815 more than 200 servants were actively engaged in carrying out the many duties necessary to operate the fur trade business of the Columbia District. And several of the gentlemen who supervised the activities later became prominent persons in the development of government in the far western world.

The fort rapidly grew from its original size of 300 feet square to more than double that size in order to accommodate the huge warehouses in which were stored the produce from its farms and the furs from its subsidiary establishments. Not only inside the fort but on the outside its activities increased. Its farm lands became larger and even were extended up the fertile Cowlitz Valley. Its flocks grew, and from these others were started at its interior posts by the transportation of young animals up the river by boats. Its horse herds increased as the need for animal transportation grew on its many fur-taking expeditions.

The salmon pickling activities made it necessary to manufacture many casks and barrels at the fort, and we see that coopers' sheds were erected both east of the fort and near the water front.

The produce from its grain fields necessitated the erection of grist mills for the grinding of flour. From the small mill near the fort grew the large water-operated mills some miles east of the fort where larger quantities of water were available for power.

The Company's lumbering activities made it necessary to expand still farther east to another stream coming into the Columbia. Here water power was harnessed to produce the much needed lumber for its increased building program. But McLoughlin did not stop here. He saw the possibility of selling lumber and sent cargoes to the Sandwich Islands, California, and even to ports in South America.

3/ Warre. Sketch of the Journey across the Continent of North America from Canada to the Oregon Territory and Pacific Ocean, 3.

ARCHEOLOGICAL EXCAVATIONS - INTRODUCTION

The excavations begun in 1947 in search of Fort Vancouver were exploratory in nature. As soon as the locations of the stockade walls of the fort had been found and the size of the fort actually determined on the ground, the area was laid out in 100-foot grids. Through the courtesy of the Bureau of Public Roads the site of the fort was used as a project for a student group who marked the grid system by placing hub stakes at the 100-foot intersections level with the ground so there would be no interference with the use of the area by aircraft or ground vehicles. The excavations during the first season were supervised by the author, with local laborers trained on the job doing the actual digging.

As excavations were made in specific areas of the fort, the 100-foot grids were marked out in 10-foot grids. The workers were thus able conveniently to measure in the features as they were uncovered. A chart, Figure 2, shows the layout of the grid system as used at Fort Vancouver. When excavations were made in the airport runway, permission was first received to close off and properly mark a portion of the airfield so that no incoming aircraft would be inconvenienced by the work. Fortunately, there was another long runway to the south; and even when a portion of the main runway was closed by the excavations, most of the light aircraft continued to use the remainder of it, which easily served their purpose. As soon as excavations were completed in the runway area and recorded, the holes were backfilled. In areas off the runway the backfilling was done at the end of the excavation season by earth-moving equipment, which saved in time and, especially, in the cost of such work.

The principal result of the 1947 season was the rediscovery of the location of the old fort. The northwest bastion and the three other corners were located and the dimensions of the four walls were determined. Many objects used while the fort was active were recovered from the excavations. A report entitled Exploratory Excavations at Fort Vancouver, 1947, was prepared by this author to cover the first season's work.

The 1948 excavations were carried out in search of the remains and sizes of buildings within the pickets. Beginning in the northeast area, the work progressed westward. The features definitely located included the bakery, a pit toilet, an earlier stockade wall, the kitchen, the fireplace of the Chief Factor's residence, Owyhee Church, Priest's House, and three trash pits.

Much evidence was found of the remains of the structures erected by the 113th Squadron (Engineers) in 1918. This squadron was formed as a part of the Spruce Production Corporation to produce spruce lumber for aircraft construction companies. It was formed in July 1918 and had been disbanded by January 1919. A total roster of 729 men had

been assigned to the work. ^{4/} The structures built over the fort area (Fig. 1) included the incinerator and dry kiln, blower, planing mill, machinery sheds and steel warehouse.

The results of the 1948 excavations were published in a report entitled Excavations at Fort Vancouver, 1948 Season. There were no excavations in 1949.

The excavations carried out in 1950 extended the search for buildings toward the west along the north stockade wall and south along the east stockade wall.

No excavations were carried out during 1951.

The 1952 excavation season began on April 7 and continued until September 12. The field work was under the direction of Donald H. Hiser and was concentrated on buildings within the stockade walls.

The four years' excavations at the site of Fort Vancouver demonstrated that this technique of documenting history has proved its value on fur trading post sites in the Pacific Northwest. Other posts at which excavations were made during the same period from 1948 to 1953 included Fort Clatsop, Fort Walla Walla, Fort Spokane and Fort Okanogan. The local people, historical societies, and state park organizations showed great interest and cooperation in these activities. The results of the excavations are available for proper interpretation of these sites, and plans are in progress for their use.

^{4/} 113th Squadron (Engineers) Air Service, Aircraft Productions, A Pictorial History of the Largest Squadron in the World, 1918-1919. This small booklet was obtained from Harry L. Craig of Vancouver, Washington, who was a Second Lieutenant on the staff of the 113th Squadron, and is now in the Fort Vancouver National Monument library.

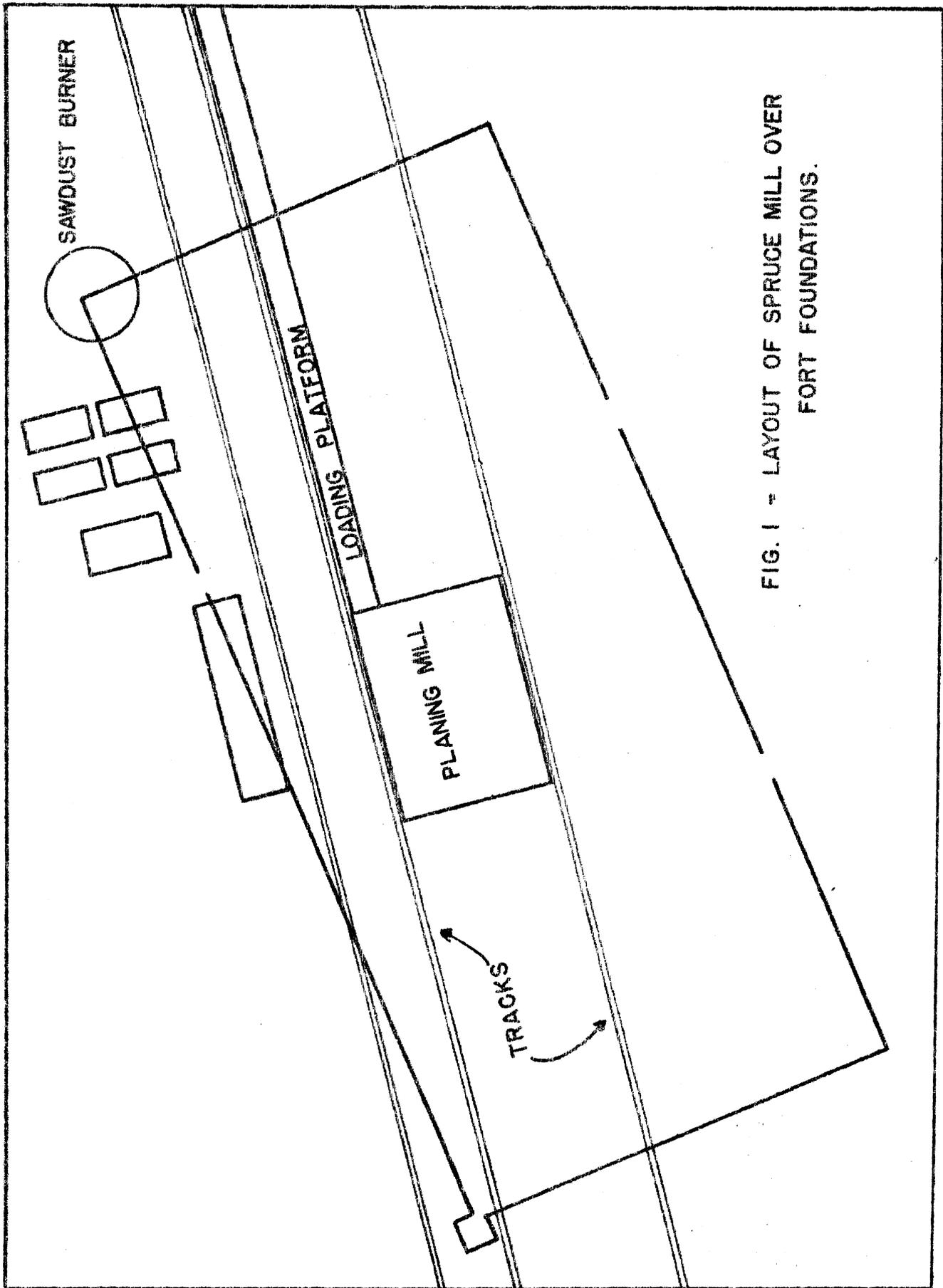
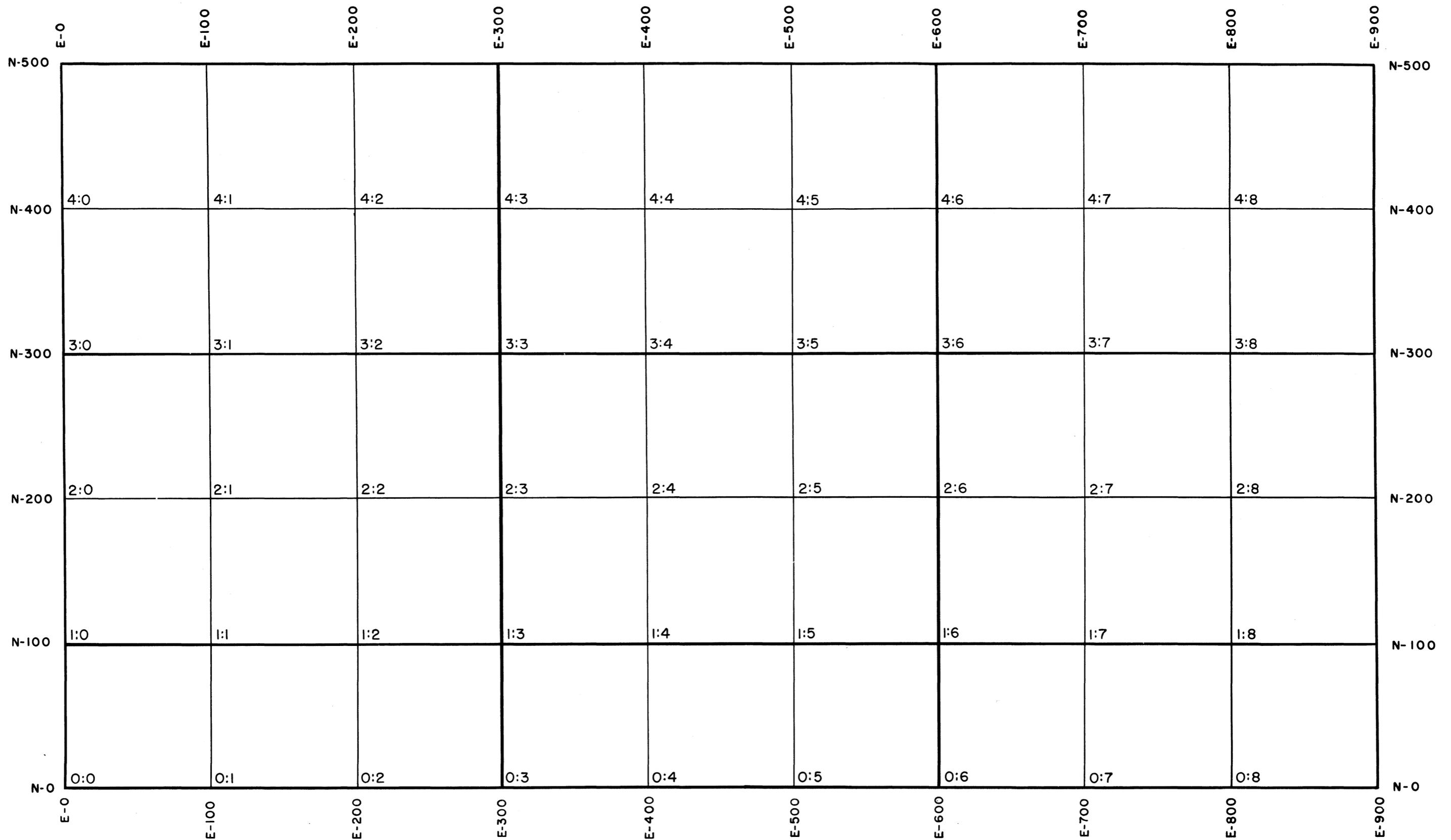


FIG. 1 - LAYOUT OF SPRUCE MILL OVER
FORT FOUNDATIONS.



INDEX TO LOT NUMBERS — FORT VAN COUVER EXCAVATIONS

FIGURE 2

EXCAVATIONS

During the 1950 and 1952 summer seasons the program of excavations continued the 1947 and 1948 explorations which have been reported. On October 10, 1952, the excavations were terminated after the finding of all but four structures within the stockade walls. The Roman Catholic Church and the carpenter shop shown on the Emmons ground plan of 1841 were not found. The carpenter shop shown on the Vavasour Map as "p" was never located, nor was the beef store shown as "q". Outside the stockade at the southeast corner three coopers' sheds remain untouched.

During 1950 (Plate II) the work continued westward and southward from the northeast area of the stockade. Evidence was continually found of the overlay of the spruce mill built in 1918 by the Spruce Production Corporation. As the work progressed westward, however, it was noted that none of the footings of the Hudson's Bay Company buildings had been damaged. A glance at the map (Fig. 1) showing the location of the spruce mill buildings in relation to the fort explains why the damage was done only in the northeast corner. The circular sawdust burner was of concrete and when finally demolished after abandonment was buried in the northeast section of the fort, thereby destroying many of the foundations.

The following historical maps, sketches, and photographs, all previously illustrated in the reports by Dr. John A. Hussey and Louis R. Caywood, or now reproduced in this report, were used in this study:

1. Ground Plan of Fort Vancouver and Sketch of Palisade, 1841, from Diary of George Foster Emmons, courtesy of the Yale University Library.

2. View of Fort Vancouver from the Southwest, 1841, drawn by Henry Eld. This is found on page 327 of volume 4 of Wilkes' narrative.

3. Sketch of Fort Vancouver and Plain, Representing the Line of Fire in September 1844. (Photostat supplied to the National Park Service by the Hudson's Bay Company.)

4. Sketch of Fort Vancouver and Adjacent Plains made by M. Vavasour, 1845.

5. Fort Vancouver from the Southeast, drawn by Henry J. Warre, 1845.

6. A Painting of Fort Vancouver from the Coe collection at the Yale University Library. Artist and date unknown (see Plate I).

7. Map of Fort Vancouver and Village in 1846. (Photostat supplied to the National Park Service by the Hudson's Bay Company.)

8. Map of the Government Reserve at Vancouver, Oregon, August, 1850, by Brevet Capt. James Stuart (Photostat from the General Land Office Records, National Archives).

9. Hudson's Bay Company's Post at Fort Vancouver, July, 1851 (from Smithsonian Institution).

10. Fort Vancouver from the North, July 2, 1851, drawn by George Gibbs. (From Smithsonian Institution.)

11. Original Plan and Notes Made by Col. B. L. E. Bonneville, 4th Infy., after his Survey of the Military Reservation of Fort Vancouver in 1854 (Photostat made from the "original tracing" of the Bonneville Map).

12. Same as 11. (Photostat from copy in General Land Office Records, National Archives.)

13. Ground Plan of Fort Vancouver Military Reservation, 1854, by Joseph K. Mansfield.

14. Fort Vancouver from the Northwest about 1855, drawn by Gustavus Sohn.

15. View of Fort Vancouver from the Northwest, 1855, drawn by R. Covington.

16. Topographical Sketch of Fort Vancouver and Environs, 1855. (Photostat of a map in the Vancouver Public Library, the original of which has now disappeared.)

17. Fort Vancouver and U. S. Military Post with Town, Environs, &c., 1859, by R. Covington (Photostat supplied to the National Park Service by the Hudson's Bay Company).

18. Map of the Military Reservation at Fort Vancouver, W. T., surveyed under the direction of Capt. Geo. Thom, Topographical Engrs., by Lieuts. J. B. Wheeler & J. Dixon, Topl. Engrs., by order of Brig. Gen. W. S. Harney, 1851. (Photostat from copy in General Land Office Records, National Archives.)

19. Photograph: Northeast Corner of Courtyard, Fort Vancouver, May, 1860. (Copy furnished to National Park Service by Provincial Archives, Victoria, B. C.)

20. Photograph: Northwest Stockade Corner, Fort Vancouver, May, 1860. (Copy furnished to National Park Service by Provincial Archives, Victoria, B. C.)

21. Ground Plan of Fort Vancouver, June 15, 1860.

22. Spokane, Portland & Seattle Ry., Vancouver Military Reservation. (Copy furnished by H. G. Richardson, Portland, Ore.)

For ease in field work and for general reference the buildings and other structures at Fort Vancouver have been numbered. The numbering system used was our own. Emmons also numbered the buildings, and letters were used to designate the buildings on the Vavasour ground plan as reproduced in the Oregon Historical Quarterly for March 1909. The nomenclature of the buildings and structures used are based on those set up in the excavation report for 1947. In some cases several names were used for individual buildings, but to avoid additional confusion the following chart (Fig. 3) showing the numbering and nomenclature has been adopted for this report. The years which are checked show when excavations were done at the specific structure.

Fig. 3. Structures and Features Excavated in Fort Vancouver

1947	1948	1950	1952	Name of Structure or Feature
x			x	1. Bastion
			x	2. Well No. 1 (Trash Pit No. 18)
			x	3. Beef Store
			x	4. Shop and Stores
			x	5. Stores
x				6. Powder magazine
			x	7. Stores
			x	8. Stores
		x	x	9. Wheat Store
	x	x		10. Carpenter shop
				11. Old office
			x	12. Roman Catholic Church
				13. Office
		x		14. Jail
	x	x	x	15. Owyhee Church
	x			16. Priest's house
	x	x	x	17. Kitchen
	x	x	x	18. Chief Factor's house
			x	19. Harness shop
		x		20. Dwelling house (Bachelors quarters)
			x	21. Indian shop (Trading store)
			x	22. Blacksmith shop
			x	23. Iron store
	x			24. Bakery
			x	25. Well No. 2
			x	26. Root house

In addition to these buildings as listed, Emmons showed a carpenter shop to the south of the Roman Catholic Church. No effort was made to determine the location of this first carpenter shop. The number of buildings varied from period to period as shown by the ground plans. The Emmons plan of 1841 shows only 19. The Line of Fire map of 1844 shows 20. The Vavasour plan of 1845 shows 22. Covington in 1846 showed only 19.

Bastions (1a and 1b)

The northwest bastion, excavated in 1947, was a square structure measuring 20 feet on the side. Except for a very small portion, it protruded mostly out of the stockade area in the northwest corner. According to the various descriptions, it was three stories in height with an octagonal top in which were a number of three-pound cannon. The 1860 photograph shows the construction as being two ten-foot posts-in-the-sill sections on either side.

One of the first drawings of Fort Vancouver was made by Mr. Joseph Drayton, an artist of the United States Exploring Expedition, in 1841 when he and Commander Wilkes were guests of McLoughlin. ^{5/} This shows the fort from the southwest and without bastions. Lieut. Emmons' sketch of the fort further verifies this. The 1844 "Line of Fire" sketch shows no bastions either, but Warre and Vavasour's report of October 26, 1845, states that:

"Fort Vancouver is similar in construction to the posts already described, having an enclosure of cedar pickets 15 feet high, 220 yards in length and 100 yards in depth. At the northwest angle is a square blockhouse containing six 3-lb. iron guns." ^{6/}

During the intervening period from September 1844 to October 1845 the size of the fort was apparently enlarged to the west some 18 feet and a 20-foot square bastion was added to the northwest corner.

Lieut. Vavasour made an engineering report sent from Fort Vancouver on March 1, 1846. In regard to the defenses of Fort Vancouver, he stated:

"The simplest method of strengthening this post against sudden attack would be to dig a ditch around it, throwing the earth against the pickets, which should be loop holed and a banquette formed on the interior, erecting another small block house at the S. E. angle, to flank the south and east sides, and placing small traverses behind the gates."

The footnote which Mr. Schafer added in reference to erecting another small block house at the southeast corner states, "Which was done, to the great annoyance of the American settlers." ^{7/} Apparently this refers to the erection of a small blockhouse at the southeast corner. Where Mr. Schafer obtained his information that this bastion was built has not been determined. However, during the excavations in 1952 enough evidence

^{5/} Wilkes, IV, 327.

^{6/} Schafer, 46.

^{7/} Schafer, 86.

was uncovered along the south wall at the southeast corner to verify the fact that a structure had been in place here at one time. The rotted remains of three parallel timbers roughly 6 to 8 inches square were found paralleling the inside wall.

These foundation timbers were 16 inches below the present ground surface. Trenching was not done south or east of these to determine if portions of similar remains were in place. However, it is believed that such evidence probably exists and that this was the foundation of a small blockhouse built because of the recommendations made by Vavasour in 1846. How long the structure remained in place is not known, but it has never appeared on any of the ground plans or drawings of the fort. It does not appear in any of the drawings made by Gibbs in 1851; so if it had been built in 1845 or 1846 it was soon removed.

Beef Store (3)

The beef store was the first structure to be searched for in the 1952 season. Several trenches were dug parallel to each other, running north and south from the north stockade wall. No footings of the structure were ever found. A trash pit, No. 18, was discovered, which later turned out to be Well No. 1. The only remains of the beef store was a well defined section of wooden flooring (Plate XIII) preserved by pitch and asphalt. The entire area of flooring uncovered was 16 inches below the present ground level.

On the Emmons ground plan there is a building in the general locality of the beef store which is shown as Building No. 18 and called a general store. Its location as the beef store does not agree with that on Vavasour's ground plan. The distance between the wheat store and the beef store was about 42 feet according to Vavasour's plan, and the beef store measured 32 by 85 feet. By plotting this on the map it agreed so well with where it should be that it has been shown in dotted lines on Map No. 11. The flooring was all within the area of the beef store. By studying the reproduction of the painting (Plate I) a long building with a hipped roof can be noted to the right of the white, gable roof building. The white building was the wheat store. The long building undoubtedly was the beef store since its position in the painting seems to fit the location on Vavasour's plan.

In the southeast corner of the beef store was found the remains of an oak barrel and a three-sheaved wooden block (Plate XIII). The barrel had contained what appeared to be a mixture of resin and asphalt (and animal remains); i.e., hair, bones, and parts of hoofs, etc. The oak staves were very well preserved. The block had rested in this mixture and was in a fair state of preservation. A large piece of saturated native tule matting was found beneath the block in a good state of preservation. What appeared to be the hair of some animal, such as a cow, was found in abundance in the compound.

A good collection of iron objects, such as barrel hoops, cannon balls, grape shot and broken tools, were found scattered around the area of the beef store floor.

What happened to the beef store is not known. In the 1860 photograph of the west end of the fort there is no evidence of the structure. Presumably it was removed before the fort was abandoned. It apparently had not rested on footings or they would have been found. Even if it had rested on footings and these had been removed, the places in which these had been resting would have been discovered.

Stores and Shop (4, 5, 7 and 8)

Four large storehouses were built within the stockade. These were located during the 1952 excavations by trenching until most of the footings were found. Two of these buildings were along the west stockade wall and two along the south stockade wall. According to Vavasour's plans of the fort, the measurements were approximately as follows:

No. 4	Shop and stores	86' x 40'
No. 5	Stores	90' x 40'
No. 7	Stores	100' x 40'
No. 8	Stores	100' x 40'

These measurements agree with those submitted in the inventory of 1846-1847.

All ground plans of Fort Vancouver show the four large storehouses along the west and south walls. These huge buildings were all reported to have been two stories high. However, a study of the 1860 photographs shows that they were in reality one full story with another part story under the shingled hip roofs. They were all erected during the period from about 1843 to 1845 to replace earlier and cruder structures which stood on the same sites. 8/

Excavations were made in 1952 to locate the northwest corner of the Shop and Stores, Building No. 4 on the map. A measurement of 85 feet was made from the north main stockade wall and 45 feet from the west main stockade wall. These measurements were taken from the Vavasour ground plan. The northwest corner footing was found about where it should have been. By excavating every ten feet east and south the footings of two sides were all located. By continuing this "jump method" of excavating every ten feet, the remaining footings on the east and south sides were found. All of the footings followed the general pattern in that they were of Douglas fir, some were partially burned, all were in a poor state of preservation, and those on the sides of the building were perpendicular to the long axis. The fill from these excavations contained enough beads and lead shot to warrant considerable screening. In 1947 screening had also been done here because of the number of beads showing on the surface.

The footings of the remaining three storehouses were found by similar methods of excavation in rapid order. The footings of the east and west walls of Store No. 5 lined up with those of the east and west walls of the Shop. It was only a matter of trenching south from the southeast corner footing of the Shop in order to pick up the northeast corner of the Store.

Stores No. 7 and No. 8 had their long axes at right angles to the south end of Store No. 5. Finding the first, or northwest corner, footing of Store No. 7 caused some trouble at first. However, after it had once been located, work progressed as rapidly as it had on the other two buildings. Store No. 8 presented no problem at all. Because of the one-hundred-foot lengths of these buildings trenches were cut across their long axes to determine whether or not any stringers had been used between the north and south walls. This work produced no such evidence.

Powder Magazine (6)

The stone foundations of a powder magazine were found in 1947 and described in the report for that year. The structure found was located in the southwest corner of the stockade. Further studies lead us to believe that perhaps there had been two powder magazines constructed at Fort Vancouver, providing the first one was within the small stockade. If so, they were of brick or stone or a combination of both. After the enlargement of the fort this building could have been rebuilt at the location where it was found.

In 1832 mention is made by John Ball of a powder magazine having been built by that date. Other travelers visiting the fort mention its existence and that it was constructed of either stone or brick. It is reported to have had an arched roof of brick and stone. The height of the building must have been rather low as it does not appear above the walls in any of the sketches of the fort.

Wheat Store (9)

The next building to the west of the area where the carpenter shop had been located was the granary or wheat store. According to Hussey's research the building was given various dimensions at different times. According to James Douglas a new granary capable of holding 18,000 bushels of grain was completed in 1839. This structure appears on the Emmons plan and survived until 1860. Vavasour's plan shows it to have been about 42 by 51 feet. Difficulties beset the search for this structure from the beginning. During World War II the area had been used as a motor pool and some extra thick layers of gravel were placed for roads. The wheat store footings were beneath one of these roads. The gravel had cemented together so hard that it was almost impossible to go through the 12-inch layer. Several pick handles were broken during the work.

Tests were made on all four sides of the wheat store to locate the footings. In doing this the remains of an unknown structure were found to the north of the wheat store. Two parallel timbers laid in the ground formed the east and west limits of a hard packed earthen floor. This floor had been burned until the earth had turned to red and yellow. No footings were found in connection with this structure. No knowledge of what the structure might have been has come to light.

Not all of the north-south wheat store footings along the east wall were found. East and west the corner footings were 52 feet from center to center. North and south the measurement was 40.5 feet. Inside this building was found a mass of iron sheets. These had been fastened to wood by the use of small, well-made, square nails about an inch in length. Many of these metal sheets were still interlocked. From a study of the photograph of the wheat store, it appears that it had a "shingle" roof. This might well have been a metal roof of interlocking sheets of iron such as were found.

There is also one other possible suggested use for these interlocking iron sheets. The masses of metal sheet were found in the wheat store area in several rows running east and west. The remains of the sheets were on top of burned wood. If there had been provisions made for rat-and mouse-proof wheat storage bins, the finding of the metal sheets in such arrangements would point to this possibility also. (Many of the interlocking metal sheets were found in the Hudson's Bay Company period of Well No. 1.) Perhaps they were used both as a covering for bins and as shingles for the roof of the wheat store.

Carpenter Shop (10)

The area of the carpenter shop shown on Vavasour's map was completely uncovered, with no trace of any building foundations. This concluded the search started in 1948 for remains of the shop. During these tests a long, narrow trench was dug out which led from Trash Pit No. 2 toward the granary. Also, a very small pit toilet (Pit No. 11) was found during this work. From the 1846-1847 inventory the shop measured 20 by 40 feet. Vavasour's plan shows the building as having these measurements. The construction must have been of such a nature that no evidence remained below the surface of the ground. If the shop, including the footings, had ever been moved away, the evidence in the remains of holes in which the footings had been placed should have remained.

No attempt was made to find the carpenter shop shown on the Emmons plan as Building 12. That shop and the one on the Vavasour map are the same size. It could be that the shop was moved to its new location before 1845 and perhaps placed on footings on the surface of the ground. If this was the case, no evidence of either structure could ever be found.

Old Office (11)

The Old Office building is noted on the Emmons plan as No. 5 and called a Clerks' Office. The size of this building as given in the inventory of 1846-1847 was 30 feet square. It is shown as a square building on both the Emmons and Vavasour plans and measures exactly 30 feet square on the latter plan. An interesting observation is that on the Emmons plan the doorway faces the west. It is mentioned by both Tolmie in 1833 and Gray in 1836. ^{9/} No mention of this building is found after 1847; so it is presumed it probably was torn down because of its age and its activity was transferred to the new office.

Although this building was not searched for specifically, considerable testing was done in the immediate vicinity. No traces were found of any footings belonging to this building.

Roman Catholic Church (12)

The area where the Roman Catholic Church had been located was thoroughly tested by a number of deep trenches running both north and south and east and west. No trace of this building was found.

The first Catholic services at Fort Vancouver were held on November 25, 1836, in the school house by Fathers Blanchet and Demers. These priests, however, did not remain in residence at Fort Vancouver as they were doing missionary work part of the time. It was not until the fall of 1842 that funds were voted for the "Catholic Mission" on the Columbia. Two additional priests came in 1842. It was determined in Hussey's studies that an old store building within the pickets was made available for Catholic services in 1838 or 1839. ^{10/}

From the deposition of Archbishop Blanchet taken before the Surveyor General of Washington Territory at Vancouver, Washington Territory, it has been found that religious services were held between 1838 and 1844 in the old store inside the pickets. ^{11/}

The building of the new Catholic Church outside the stockade took place in the years 1844 and 1845. The building is shown on the Line of Fire Map of 1844. The new building was dedicated on May 30, 1846. ^{12/}

Office (13)

Fourteen footings of the new office or counting house were found west of the priest's house. The building, according to the inventory of 1846-1847, measured 30 by 36 feet. Vavasour's plan gives an approximate measurement of 30 by 40 feet. The footings of this structure

^{9/} Hussey, 183.

^{10/} Hussey, 174.

^{11/} Claim of the Mission of St. James, Vancouver, 24.

^{12/} Nichols, The Mantle of Elias, 280.

were large slabs and well preserved. From center to center of the corner footings the building measured 31 by 37.5 feet. A study of the map shows that this office had been built over the location of a stockade wall.

Jail (14)

Six badly rotted footings of the jail were found to the west of the Owyhee Church. The building measured approximately 21 by 28 feet, according to the Vavasour plan of the fort. The measurements according to the findings were about 20 by 22 feet. To the northeast of the jail was a small pit toilet, No. T.P. 5, measuring 7 by 10 feet, which had been constructed by placing four upright posts in the ground. These posts had been braced by placing large stones around them before filling the post holes.

Owyhee Church (15)

Search for the Owyhee Church was made in 1948 without too much success. Again in 1950 more of the area was uncovered until a few very fragmentary remains of footings were found along the east side of the building. According to the inventory of 1846-1847 the building measured 25 by 50 feet. This agreed with Vavasour's plan. The actual measurement of the east side was about 24 feet. Because of the powdery condition of the footing remains, it was difficult to determine the exact centers of the walls.

Priest's House (16)

The priest's house was excavated in 1948. It appears in the 1860 photograph. The front of the building faced the south and was covered with weatherboards. There were four French windows, two on each side of the centrally located door. The photograph shows that the west side of the building was of the "posts in the sill" construction. Probably the front was of the same construction but covered with weatherboards to make a good appearance from the south gates and the courtyard. A plastered chimney and another French window appear on the west side in the 1860 photograph. According to the 1846-1847 inventory, this building measured 50 by 30 feet. Excavation revealed the overall measurements from the outside of the footings to be 51 by 30 feet, 6 inches. The footings were of Douglas fir and badly rotted. They were about 6 inches below the original ground level with 10 inches of overburden, making 16 inches in all from the tops of the footings to the present ground level. They were between 2 and 3 inches in thickness and varied in width from 6 to 18 inches. In the centers of the east and west walls areas of stone, brick and plaster were found. That on the east measured 4 by 5 feet and the one on the west was 4 feet in width. It was not entirely excavated due to bad weather. Some stones, not set in plaster, were found in the west wall which had been part of the foundation.

The footings of the north and south walls are so aligned that they are parallel to the north stockade wall. Eight various shaped blocks of wood, counting the corners, were found along the south wall. These were

not spaced too uniformly, so as to designate that they were all footings of the posts for the sills. In the 1860 photograph it is impossible to tell where the posts are located in the wall of the priest's house because of the weatherboards. Neither were the sections of wood along the north wall spaced to show that they were the sill footings. Several of the footings were about 10 feet from each other or from the corners. On the west wall the footings were definitely those for the sills. On each side of the fireplace foundation on the west wall there appeared a footing which measured 18 by 24 inches. These centered a little more than 10 feet from the corner footings. In the 1860 photograph there are two posts in this area in the south side of the fireplace.

Kitchen (17)

During 1947 no effort was made to locate the kitchen. In the fill of the north stockade walls to the rear of the kitchen a great amount of broken English earthen ware was recovered.

In 1948 explorations uncovered what must have been the kitchen built after 1852. At that time the location of the Chief Factor's residence was not known and it was thought that the evidence found was that of the earlier rather than the later kitchen.

In 1950 and 1952, after the finding of the Chief Factor's residence, the kitchen areas were again explored. Both kitchens appear to have had plaster floors, but the limits of neither could be absolutely determined. The remains of plastered flooring were found about 10 inches below ground level. The entire area had at one time been plastered. We tried to follow the plaster surface but could never determine a definite edge. It finally blended into the soil of the surrounding area. The plaster floor of the earlier kitchen was badly blackened and burned, and the debris on top of it showed that a fire must have destroyed the building at one time. This is further verified by Hussey ^{13/} when we learned that this kitchen behind the residence was burned or pulled down about 1852 or 1853. The smaller kitchen that replaced it must have been the building to the northeast of the Chief Factor's residence found in 1948. ^{14/} The plastered floor in this later kitchen was white and very well preserved. This structure is shown on the Bonneville Map of 1854 and the Hanney Map of 1859.

Chief Factor's Residence (18)

In 1948 only the remains of the foundation of the fireplace of the Chief Factor's residence were found. The footings of this large building were discovered early in the 1950 season. The building measured 40 by 70 feet. This building, the most pretentious in the stockade, was

^{13/} Hussey, 167.

^{14/} Caywood, 1948, 7.

apparently still under construction by as late as 1836. By 1841 Lieut. George Foster Emmons' sketch of Fort Vancouver locates the "Commander's residence" in the location in which it was found. The photograph made in 1860 shows it as a large building with two sets of curved stairs leading up to a porch on the south side. The porch was vine covered, and beyond it can be seen large French windows opening onto the porch. The chimney from its huge central fireplace comes through the roof slightly to the north of the center of the long axis of the building, which agrees with the archeological findings of 1948.

The corner footings were different from any other footings found in that they consisted of two 8 inch by 8 inch wooden blocks set one on top of the other (Plate XII, B). All of the west footings were found in a burned condition. The intervening footings were ten feet apart. The floor must have been from three to four feet above the footings according to the photograph made in 1860. The remainder of the construction can only be guessed at. Probably there were 40-foot soles across the short way of the building. According to W. H. Gray, it was a "big square hewed-timber house." ^{15/} This statement tends to show that this building was constructed in the usual post-and-sill method and was not as yet covered by siding at the time of Gray's visit in 1836. As time permitted, the siding which hid the true construction of the building could have been added.

Harness Shop (19)

The harness or saddler's shop, according to the Vavasour ground plan, measured 40 feet by 30 feet in size. Excavations in this area failed to produce much evidence as to its location. The triangulation method employed for locating most of the other buildings failed completely in this particular case. It seems impossible to determine when this particular structure was built or when it disappeared. According to the inventory of 1846-1847, it measured 40 feet by 25 feet and was lined and sided.

The shop may have been abandoned and removed about 1852 or 1853 when the new kitchen was built to the east of the former one and over a portion of the area originally occupied by the harness shop. Spruce Mill activities in that particular area were quite numerous and disturbed much of the ground.

The only possible evidence of the harness shop consisted of fragmentary remains of footings and a short section of stone foundation found here which might also have been part of the kitchen. A brick platform, measuring 5.5 feet by 11 feet, found here probably was a base for the large kitchen stove.

^{15/} Hussey, 133.

Dwelling House or Bachelors' Quarters (20)

The long building on the east side of the stockade known by a number of names but herein called the Dwelling House was very easily found after the Chief Factor's residence was outlined. Beginning to the east of the southeast corner of the Chief Factor's residence, a trench was dug which intercepted the northwest footing. From this footing another test was made ten feet east and a second footing uncovered. Four footings made up the north wall of the structure. Since the airport had to be crossed, the full crew was set to unearth and measure in the east and west lines of footings which went into the airstrip of the airfield. As soon as a footing was found it was measured in and the earth replaced. The measurements of this building, 153 by 33 feet, agreed with those given by James Douglas in a communication to the Governor and Committee in 1838. ^{16/} At that time, October 18, he stated that the building would be completed in the course of six weeks.

Indian Shop or Trade Store (21)

The search for the Indian Trade Store accounted for considerable trenching at both the east and west ends before a footing, the northeast corner, was found. The area had apparently been disturbed at some previous time as none of the footings for either the east or west end walls could be found. One footing was missing from the north wall and three from the south wall. Four of the six remaining footings of the south wall showed evidence of burning.

The Trade Store measured 32 feet by 80 feet according to the Vavasour ground plan. The overall length of the north side from center to center of footings was 80 feet. The width was 32 feet, making this building measure exactly as Vavasour had measured it. This size has been shown with broken lines on the map to show that at least most of the footings fall in line. Since these footings are very near the present ground level, it is possible some of them may have been moved by plowing in the period immediately following the abandonment of the fort in 1860. There is no evidence that this area was ever filled. On the contrary, recent airport leveling probably would account for the removal of two or more inches from the section.

The area of the Trade Store was particularly rich in such items as lead shot, musket balls, gilt and silver-plated buttons and glass trade beads. Much of the excavated earth from the footing trenches was screened, with very good results.

^{16/} H. B. S., IV, 260.

Blacksmith Shop (22)

Even before any excavations were made in the summer of 1947, the relative location of the Blacksmith Shop was indicated by the abundance of coal, charcoal, cinders and iron fragments of all kinds. Some excavations were made in this area in the fall of 1947, but no definite features except a hard-packed earthen floor were located. A wealth of iron material was found during these first excavations, much of it either on the surface or within the first few inches of earth. The area had been repeatedly scraped as part of the airport runway, and many iron fragments were hauled away by the city maintenance crew and deposited in another area to the southeast as fill for an extension of the lower runway.

From the great amount of scrap iron, fragments of broken iron objects and tools, especially blacksmith tongs, the shop showed long usage. It probably was one of the first buildings built in the new fort in 1829. The planks used as soles for the foundations indicate that no floor except the native soil was intended. A layer of hard-packed cinders, coal dust and burned earth indicated the floor level which was from four to six inches below the present ground level.

In the 1947 report 17/ mention was made of William Cannon as the individual who was the blacksmith at Fort Vancouver. Additional research has brought out that "Among the hired men of the party /Astor's overland expedition/ was one William Cannon, who had been a soldier at one of the frontier posts, and entered into the employ of Mr. Hunt at Mackinaw." 18/ There is listed as being with the Astorians at Fort George (Astoria) on April 4, 1811, a William Channing, a millwright, undoubtedly the one and the same William Cannon. 19/

Iron Store (23)

Efforts to determine the exact location of the Iron Store were not too successful, but the position of the southeast corner was definitely fixed. According to measurements on the Vavasour map the building was approximately 38 feet by 40 feet. The floor of the Iron Store was the native soil. The hard-packed area was determined to be approximately the size given by Vavasour. The sole of the south wall had been of planks measuring 9 inches wide by 2 inches in thickness. This much was definitely located.

The Iron Store was centrally located between the two eastern stockade walls. Possibly one of the reasons for extending the fort in that direction was to provide storage for the considerable amount of iron stock which must have been on hand after the arrival of supply ships from England.

17/ Caywood, 14.

18/ Washington Irving, Astoria (New York, n.d.), 186.

19/ Elliott Coues (ed.), The Manuscript Journals of Alexander Henry and of David Thompson, 1799-1814 (3 vols. New York, 1897); III, 868.

Bakery (24)

The need for a bakery within the fort was of prime importance. No doubt a special structure for the baking of the necessary bread and biscuits was built soon after the move to the new site. However, baking may have been done at first in the kitchen. The first mention of a separate building for this activity is in 1835 and 1836 when Samuel Parker spent the winter at the fort. No location is given for the building.

The Emmons plan of 1841 shows the bakery as being located in the northeast corner of the stockade. The eastern stockade wall at that time was in the original location. During the 1947 excavations no trace of this first structure was found, chiefly because spruce mill operations and subsequent removal of the mill structures had completely disturbed this area.

By 1845 or 1846 the east wall had been moved approximately 55 feet eastward. A new bakery had been built which partly projected outside the new wall. The construction date of the bakery and wall would have been contemporaneous. During the removal of the old east wall the old bakery had also been removed.

During the 1948 excavations trenching along the east wall and in the northeast area proved that almost all evidence of the original fort structures had been obliterated by spruce mill operations. Four fragmentary footings were found which were believed to be those of the west wall of the bakery. The location agrees with that shown on the Vavasour plan. Three of the footings were spaced five feet apart. The northeast bakery corner on the Vavasour plan was about 12.5 feet from the north wall, and the northeast footing found was also the northeast footing of the bakery, which measured 40 feet by 28 feet. This agrees with the measurements as given by the inventory of 1846-1847.

During 1950 and 1952 no additional testing was done to further locate a trace of the bakery. No doubt if further careful excavation were done outside the wall, the remains of the foundations of the two brick ovens would be located unless the spruce mill demolition also removed all traces of these.

Root House (26)

After all attempts to find the beef store footings had failed, a trench was continued toward the west to determine what structures, if any, might be found in the northwest corner area. A small building appears here on the "Line of Fire" map of 1844, the Covington map of 1846, and the McConnel map of 1854. In the 1860 photograph a low structure with a gable roof may be seen near the bastion. The trench crossed the remains of a rotted sill 40 inches below the present ground surface. A mass of hewn stones, coral plaster, interlocked sheets of tin, bottles and rubbish was found here as though it had all been brought from other parts of the fort and dumped. This may have been the result of clean-up work by the U. S.

Army after the departure of all Hudson's Bay Company personnel. The structure showed evidence of having been burned.

This structure is not listed by name on any of the maps. From its construction and location, it no doubt was the "root house" that Donald Mactavish listed as one of the buildings standing in the stockade in 1858. 20/

The long axis of the building runs north and south a distance of 55 feet. The width of the building measured 21 feet. The sills of the north and east walls were completely uncovered and were found to be in a fair state of preservation. The south and west walls were not uncovered, but the southwest corner was located by digging at the intersection of lines extended perpendicularly west and south from the southeast and northeast corners. The butt ends of the south and east wall sills were uncovered here. This corner conformed with the other three except for a vertical post between the junction of the west wall sill to the sill of the south wall. The construction of the root house apparently obliterated all traces of a former stockade wall.

The wooden floor of the root house had been badly charred as though the building had been burned. However, none of the sills showed any burning. Along the earthen wall exposed on the east side of the structure was evidence of two posts sticking out at an angle. These may have been part of the low gable roof which came to the ground line.

Trash Pits, Pit Toilets, Wells and Pits

The pits uncovered had been dug for a number of uses (Fig. 4). In the main, however, they appear to have been used as outdoor toilets and for the disposal of garbage, dregs and trash. In most instances a wooden plank covering was found in place over the pit, showing that the intended use was for the disposal of garbage and trash. This also would include the disposal of dregs from chamber pots which appeared as part of the fill. A few may have had other uses, as indicated in Figure 4.

A total of twenty-one excavated depressions were encountered during the entire excavations from 1947 to 1952. Two of these were wells. A third well, and the one in use when the fort was abandoned, was not searched for. What appears to have been the pump stand for this well may be seen in the courtyard in both photographs taken in 1860.

While the 1950 excavations produced a number of trash pits containing quantities of ceramic material, the 1952 excavations uncovered only one trash pit and two wells. However, one of the wells was so rich in iron objects that the material will be the type study collection for all Hudson's Bay Company iron goods found west of the Rocky Mountains. The objects are in a fairly good state of preservation and many can be used as a basis for interpretive exhibits.

20/ Hussey, 147, 149.

Fig. 4. Information on Trash Pits and Toilets

No.	Width	Length	Depth	Date Excavated	Suggested Use	Excavated by
1	3'10"	9'8"	5'9"	1947	Combination	Caywood
2	4'4"	9'0"	6'0"	1947	"	Caywood
3	4'8"	8'3"	2'0"-3'5"	1947	"	Caywood
3A	3'0"	7'10"	6'7"	1950	Toilet, board-lined pit	Olson
4	3'8"	13'5"	4'7"	1950	Trash pit	Caywood and Caywood
5	2'5"	9'0"	2'8"	1950	Toilet - Building Footings, 7' x 10'	Hiser and Smith
6	3'9"	9'5"	5'4"	1950	Trash	Caywood
7	5'7"	9'6"	6'7"	1950	Trash	Gerald
8	6'0"	9'0"	3'8"	1950	Possible open air forge	Gerald
9	4'6"	9'0"	6'8"	1950	Trash	Gerald
10	3'0"	7'0"	4'4"	1950	Trash	Gerald
11	4'3"	4'3"		1950	Toilet	Hiser
12	3'2"	10'7"	3'4"	1950	Combination	Olson
13	4'10"	8'0"	4'9"	1950	Trash	Gerald and Hegrenes
14	4'10"	8'0"	4'9"	1950	Trash	Olson
15	6'5"	10'0"	5'5"	1950	Trash and possible use as a bellows foundation in connection with Pit No. 8	Gerald
16	4'5"	9'0"	4'0"	1950	Trash	Olson
17	4'6"	7'0"	5'8"	1950	Toilet	Olson
18	15'0" (21'3" to bottom)	15'0"	14'6"	1952	Trash - Well No. 1 - Depth only to top of cribbing	Galente
19	6'3"	9'2"	6'11"	1952	Combination	Todd
20	16'0"	16'0"	29'10"	1952	Well No. 2. Depth to Water Level	Hiser, Robinson, Galente, Hegrenes

The wells were probably more interesting than any other features found in the fort. Since they were almost completely below ground, very little could happen to change them since the period of abandonment of the fort. The first reference to the wells is found in Vavasour's account of the fort. He stated, "The establishment was removed from the rising ground before mentioned in consequence of the inconvenient distance from the river side, for the conveyance of goods and procuring of water, the latter defect has been remedied by sinking two wells in the present fort, which are supplied by the river, the water filtering through the soil, which is composed of gravel and sand a few feet below the surface, these wells rise and fall with the variations in the river." 21/

According to the ground plan drawn by Vavasour, and so often reproduced, one well was located along the north wall near the Beef Store. This is shown as a building. The other was a circular structure near the northeast corner of the Dwelling House. The former was called Trash Pit No. 18 during the first stages of excavations. It was first found in 1948 but was not recognized as either a trash pit or well at that time because of the amount of ashes above the area. It was thought instead to have been the remains of a building which had been destroyed by fire. In 1952 excavations for traces of the Beef Store disclosed trash below the ash deposit. The area was roughly fifteen feet square with rounded corners. The hundreds of objects uncovered in the first seven feet of fill (Fig. 5) were definitely not of the fur trade period but were items which could have been in use in the period from 1870 to possibly 1900. This was followed by about three feet of silt, gravel and large rocks. Below this layer a deposit of material from the Hudson's Bay Company continued to a depth of fifteen feet. At this level a well cribbing of 6 inch by 8 inch timbers, slightly less than five feet square, was discovered (Plate IX and Fig. 5). This cribbed area was explored to a depth of about eight feet but because of the danger of cave-in was abandoned before the well bottom was reached. A total depth of almost twenty-three feet was excavated.

This well is definitely part of the rectangular structure shown on the Vavasour plan as the well. If there had been cribbing all the way to the ground surface, there was no way now of knowing this. There is the possibility that the structure was a well house erected above the well. The space between the ground surface and the cribbing may have been used for the storage of perishable products but no evidence of its use, other than as a well and deposit for refuse, was found.

Another well which was not found chiefly because it was not looked for is the one shown on Emmons' ground plan as No. 22--"A deep well in which the water rises & falls with the tides." This could have been located by testing just to the west of the Priest's House.

21/ Joseph Schafer (ed.), "Documents Relative to Warre and Vavasour's Military Reconnaissance in Oregon, 1845-46," 85-86.

Apparently by 1845 it was no longer in use because no mention is made of it by Vavasour. It undoubtedly was one of the wells dug for the early fort since it comes within the area of the first fort.

The most interesting find of 1952 was Well No. 2 (Plate X). It was located by Donald Hiser by triangulating from the northeast corner of the Chief Factor's residence and from the northeast corner of the stockade by using the Vavasour ground plan. From the point located a trench was started in a northerly direction. At about four feet the trench cut across a gravel fill area easily recognizable as unnatural. This gravel area had been encountered while trenching late in the 1948 season but had not been explored further. By expanding the excavation over this gravel fill an area of about 24 feet by 21 feet was uncovered. Toward the center of the gravel fill area large boulders were encountered. After clearing away these boulders the stone-ringed top of the well was visible. Excavation down into the well was delayed until a wooden tripod with block and tackle could be rigged over the opening. This apparatus was needed to facilitate the removal of the huge stream boulders with which the well had been filled. Some of these rocks were estimated to weigh between 300 and 400 pounds.

The well was lined with large boulders down to water level. As excavation ceased at this level, the actual depth of the boulder lining is not known. The mouth of the well was circled by 15 medium-sized rocks which had an average thickness of about 13 inches. The opening at the top had a diameter of 5.2 feet. The well was cleared down to a depth of 25.6 feet below the collar and 29.8 feet below the present ground level. The level of the water in this well fluctuates with the level of the nearby Columbia River.

When the Hudson's Bay Company dug the well, they probably made an excavation nearly 17 feet square. This is indicated by the gravel fill area around the well. Then, from the bottom of this excavation they began to lay the stone well lining, thus building it up towards ground level. At the same time, they refilled behind the lining with clean gravel. When they were through, they had a stone-lined well shaft only 5.2 feet across and over 25 feet deep. The lining is still as sturdy today as it was then. Because of this feature and the fact that it was purposely filled with boulders after it was no longer used, it has remained intact as the only surviving structure of Fort Vancouver.

This well area has now been cleared and serves as a permanent outdoor interpretive device at Fort Vancouver National Monument.

Trash Pit No. 19, the only pit toilet found in 1952, was located just to the west of the next to the last west stockade wall. This pit appears to have been excavated primarily for use as a toilet, but it was later used for trash. A number of objects were found here which are of value as museum material.

The importance of the trash pits from an archeological standpoint cannot be underestimated because it was from them that the bulk of the repairable artifacts came. Pre-season excavations began in 1950 to show some visiting Service officials how it was done. In the process a trash pit was found and opened. This was on a Friday. Fear of vandalism over the week-end led Mrs. Caywood and the author to excavate most of the pit on Saturday and Sunday. It measured 18 feet long by 3 feet wide and 4 feet deep. More than two pickup truckloads of boxes of artifacts were recovered from this pit. Thus, when Miss Florence J. Howard reported for duty as archeologist aid on May 31, she found material enough for more than a full month's work of cleaning, sorting, classifying, repairing and cataloging.

The trash pits had been originally dug with rounded corners. The geologic formation changes at about four feet in depth from a soil to a loose formation of cobbles and sand, probably river laid, and was not conducive to easy excavation. Well No. 1 was carefully excavated along the original outline. It was found that the original well had sloughed, so that the corners of the large excavations were rounded (Fig. 5).

Trash Pits Nos. 1, 2 and 3, excavated in 1947, each showed evidence of a plank covering. In general the contents were broken and discarded objects of all kinds. Each of these pits had been used for the disposal of dregs and their use is listed in the chart (Fig. 4) as combination.

Pit No. 3A, excavated in 1943, was definitely an outdoor pit toilet of long use. Except for a very few articles, the pit contained nothing but human excrement and many smooth oval stones measuring about three inches in length by one inch in width and a half inch in thickness. Several pipe bowls found in this pit appear to have been dropped in by accident. Planks laid around this pit as part of a floor clearly showed that a small structure had originally been built above this pit.

A small pit toilet, No. 5, was found in connection with the search for the jail on June 22, 1950. A few very fine pieces of broken green underglaze Spode earthen ware were found here.

During exploration for possible remains of the northwest corner of the Owyhee Church, Trash Pit No. 6 was discovered. This pit had a plank covering still in place over it. The planks had been laid north and south across the narrow way of the pit. Large quantities of window glass were encountered first beneath the plank covering; then pieces of broken bottles and earthenware, including plates, cups, bowls, and chamber pots, were found.

Along the outside of the west wall of the 1828-29 stockade four trash pits were uncovered, Nos. 3, 7, 8 and 9 (one pit), and 15. Pit No. 7 (Plate VI) was adjacent to and south of No. 3 and was found by Miss Tony Howard who worked one full day at the excavations. The remainder of the excavation of Pit No. 7 was undertaken by Mr. Rex E. Gerald who recovered

a good collection of historical material, especially in the first 33 inches of the fill. Ash and orange colored earth between the 29-inch and 50-inch level indicated a fire.

Pits Nos. 8 and 9 (Plate V) were discovered while tracing out the west wall of the 1828-29 stockade. Although a single pit as far as excavation was concerned, it showed two periods of occupation and has been given two numbers. Pit No. 8 went to a depth of 3 feet 8 inches and was lined with a well plastered layer of earth or clay which had been burned to an orange and even whitish color in spots. Beneath this plastered surface was a lining of wooden fragments over which the clay had been placed. Above the fire-burned clay was a layer of charcoal, ash, coal dust, slag and many iron objects coated with rust and coal dust. The suggested use of Pit No. 8 was that it had been a large open-air forge or smelter. A break in the clay lining on the north side may have allowed the entrance of a pipe from a bellows.

The remainder of the depth of Pit No. 8 was called Pit No. 9. A great number of objects were recovered but no additional use of this pit could be determined except a depository for trash discarded by the personnel of the fort.

Pit No. 15, just to the north of 8 and 9, contained a number of upright posts and a plank bottom (Plate VII) as though the pit had been used as a receptacle for some heavy piece of machinery. It had, however, been filled by successive layers of trash, burned earth, and ashes. Whether or not it was used as a place for a blower or bellows for an underground hearth in Pit No. 8 could not be positively determined. A short outlet trench to the south and a long plank-covered incline to the west were features of this Pit No. 15. This inclined box trough was built of 2" x 10" material.

Along the north stockade wall, between it and the kitchen, were found two trash pits, Nos. 10 and 13, into which had been thrown broken earthenware (Plate VIII), glass and other objects from the kitchen and residence of the Chief Factor. After cleaning and assembling the broken pieces many fine dishes of Spode earthenware were repaired. These caches of broken Spode and other objects appear to indicate an intentional disposal of good, new material. It could be that at the time of abandonment the personnel leaving the fort could not carry away everything in the small vessel, the Otter. Rather than let anything of value fall into the hands of the American soldiers, quantities of goods could have been broken by throwing them into Trash Pits Nos. 10 and 13. Complete broken dishes were found nested together as though this had happened.

Pit No. 11 was a small oval pit toilet. The remains of two upright posts were found south of it. The structure undoubtedly was attached to the stockade wall since no remains of other posts were found.

Beginning in the northeast corner of the old stockade and along the inside of the wall, were found four pits, Nos. 12, 14, 16 and 17. Nos. 12 and 16 contained beads, clothing, shoes and some pieces of earthenware and glass. Nos. 14 and 17 were two of a series of pit toilets used by the occupants of the bachelors' quarters. The Emmons ground plan shows four such structures. The Covington plan shows six. Since only two were found, there is no way of knowing which ground plan is correct except by more excavation. These two were filled with fine sand, excrement and a few incomplete broken objects. Parts of plates and other vessels such as cups, saucers and glasses were found but none was restorable.

Gates

The first contemporary information on the three gates in the stockade walls is found on the Emmons plan of 1841 and the Henry Eld pencil sketch of the same year. Vavasour's ground plan and Warre's water color, both of 1845, show the gate openings in the same relative position. Emmons described them as folding gates. By this he must have meant two gates swinging from gate posts on each side of the opening. Unfortunately, not too much attention was given in the excavations to the finding of the three gates during the four seasons of work. At the time other features seemed of more importance.

In checking the excavations on the north wall, it is found that the position of the gate would have been between the Owyhee Church and the kitchen as shown on the Vavasour ground plan. This opening should have been about two hundred feet from the northeast corner. Except for about sixteen feet in this area the north stockade wall was uncovered and no trace was found of a gate opening. Probably the opening was within the unexcavated area.

Along the south wall the east gate should have been about two hundred feet from the southeast corner. No excavations were made at this location.

The southwest gate position was found between the openings of the two long store buildings. Both south walls were excavated here. The earlier or inner stockade wall trench at this location was found to have been filled with rocks as though the pickets had originally continued across here and the gate was an opening in the wall. However, in the outer wall the gate posts and opening were definitely located. The remains of the posts measured 13 inches in diameter and had been buried four and one-half feet in the ground. From center to center of posts, the gate opening measured exactly ten feet. The actual opening, allowing for the posts, measured seven and eight-tenths feet across. To these huge posts had probably been fastened two large "folding" gates which met in the center and could have been fastened by a bar resting in sockets on either gate post or by a hasp and lock arrangement or both. No gate hardware was found at the gate's southwest location.

From the drawings showing the gate openings, they were not as high as the stockade, but were evidently cut out of the stockade wall.

PHYSICAL GROWTH OF THE FORT

The excavations at Fort Vancouver were not complete, but more than enough trenches were dug to determine fairly well the history of the fort. Further work might be done to discover certain features which would give a little clearer picture, but certainly this is not necessary to add to the present archeological findings. The measurements of the outermost stockade walls as found in 1947 were as follows:

North wall	731 feet
South wall	733 feet
West wall	326 feet
East wall	323 feet

A study of the dimensions of the stockade walls as given by travelers and visitors from the earliest times of the building of the fort confuses rather than helps in trying to determine construction sequences. The following compilation arranged in chronological order has been made from the various sources:

Year	Dimensions	Converted to feet	Sources of estimates or measurements
1828-9	100 yds. x 100 yds.	300 x 300	Jedediah Smith
1835	37 rds. x 18 rds.	610.5 x 297	Samuel Parker
1837	750 ft. x 450 ft.	750 x 450	W. A. Slocum
1839	250 yds. x 150 yds.	750 x 450	T. J. Farnum
1839	300 yds. x 300 yds.	900 x 900	Edward Belcher
1841	600 ft. x 200 ft.	600 x 200	G. Simpson
1841	700 ft. x 400 ft.	700 x 400	G. F. Emmons
n.d.	250 yds. x 150 yds.	750 x 450	J. Dunn
1845	800 ft. x 500 ft.	800 x 500	G. Hines
1845	220 yds. x 100 yds.	660 x 300	H. J. Warre and M. Vavasour
1846	226 yds. x 106 yds.	678 x 318	M. Vavasour
1847	750 ft. x 330 ft.	750 x 330	H.B.C. Inventory
1854	200 yds. x 175 yds.	600 x 525	I. I. Stevens

A summary sheet has been compiled from the nine sectional excavation maps for the purpose of diagramming the outlines of the various stockade walls and the locations of the buildings. Where features were not positively identified but where reasonable proof of their former locations was determined, their outlines have been added with dashed lines.

In 1947 the outlines of Fort Vancouver were determined by excavations at the four corners and along the north wall. Although a section of another inner, east stockade wall was discovered in two places, it was

not thought to be part of the palisade but of an interior building. In 1948 about half the same wall was worked out. The posts were small, badly rotted, and no cultural material was found in the fill around the posts.

In 1950, along the north wall it was found there were three rows of stockade posts. The inner row was the oldest.

The 1952 excavations revealed the remains of a number of other stockade walls as shown on the map summary sheet. The sequence of these walls, if determined, should tell us the history of the construction of the fort. We find that there are two squares, A B E D and B C E F. Then to the west are two long sections included in the fort when later stockade walls were added. To the east is another section added by new wall construction.

From the condition of the remains uncovered, the area B C E F appears to have been the first construction at this site. The size of the early fort erected in 1828 and 1829 was, according to Jedediah S. Smith, about 100 yards square. The actual measurements as found are approximately 318 feet square. The posts of three of these walls were uncovered and studied. In all places where they were exposed the posts were small, averaging from five to seven inches in diameter. In many instances the evidence of the post was nothing more than a mold core resulting from the complete rotting away of the post. No cultural material was found in any of the trenches.

The next record of the size of the fort was that of Samuel Parker from his observations made in the winter of 1835-1836. His estimate of the size was 37 rods by 18 rods, or 610.5 feet by 297 feet. For nothing more than an estimate in rods this was fairly accurate and shows that by this time the area enclosed by walls was double that given by Smith five years earlier. The question arises from documentary studies as to which square, A B D E or B C F E, was the earlier. The trenches around A B D E, as uncovered along AB and AD contained some artifacts, which fact would lead us to believe that these walls were built sometime after the fort was occupied and refuse began to accumulate. However, the posts of the wall AD were also small and badly rotted. Those in AB were small but appeared to be in slightly better condition. If the square A B E D was the first fort, as is suggested by some evidence, the wall AB might have been replaced in the same trench since there are only two parallel rows of posts here.

In 1841 Lieutenant G. F. Emmons gave an estimate for the size of the fort as 700 feet by 400 feet, which is clearly nothing more than an estimate, but his ground plan of the fort is valuable for its many details. It is noted that the wall between the two squares had disappeared by that time. The doors on three of the buildings on the Emmons ground plan, the office, the church, and the carpenter shop, all face west, as though they were at one time part of the western square.

From the documentary evidence it appears difficult to determine which square was the earlier, but from archeological evidence the eastern square would be favored. The separation of the fort into two squares may have been merely a matter of convenience necessitated by construction needs. It is obvious that certain buildings must have remained in the same positions over the years. The brick or stone powder magazine constructed in 1832 is an example. It would have been rather pointless to have rebuilt such a structure. There is no evidence of its having been in any location except in the southwest corner. McLoughlin probably had planned the fort to be this size originally, but due to pressure on his limited personnel and because of the intermittent fever, construction lagged far behind, even on the necessary buildings. The center wall **BE** may have been intended only as a temporary measure to enclose one portion of the fort before the entire stockade wall was completed.

After 1841 the next plan is the "Sketch of Fort Vancouver and Plain, Representing the Line of Fire in September, 1844," called in this report the "Line of Fire Map." This valuable document was an official Hudson's Bay Company record to show the results of the fire which nearly caused the loss of the fort. It also shows the high water or flood line of that year. From the scale on the plan, which is in yards, the measurements of the fort are approximately 750 feet by 330 feet. The plan permits the dates of the destruction and the erection of certain buildings within the fort over a specified period of time to be determined.

Warre and Vavasour in 1845 and 1846 submitted two sets of measurements for the fort as well as a ground plan dated 1845. The latter was used for the purpose of locating the various buildings and features within the stockade before excavations began in search of specific feature. It proved very helpful and time saving, even though it was soon learned that errors had been made in the dimensions of the fort and in the placement of the buildings. Its interpretation helps somewhat in trying to place dates on additions to the fort when used with the earlier plans of 1841 and 1844. It is noted that the New Office and the Iron Store were built between 1844 and 1845.

The Emmons plan of 1841 apparently shows the fort while still in the "doubled-in-size" period before any of the end additions had been made. The 1844 plan shows the Bakery as part of the east wall but does not show the Iron Store. On the west side the Bastion in the northwest corner is not shown, but the length of the east-west walls as drawn is approximately 750 feet. The 1845 plan of Vavasour gives the length of the fort as about 678 feet and shows both the Bastion in the northwest corner and the Bakery in the east wall. The measurement given in the Warre and Vavasour report of 1845 is 660 feet, the exact length of the doubled fort plus the 21-foot addition on the west, but without the 18-foot addition on the west or the 56-foot addition on the east side.*

*It will be noted that sometimes measurements vary by one foot. In this case the addition measures 55 feet on the north and 57 feet on the south. An average of these two measurements has been used.

In 1846 the new measurement of the length of the fort as given by Vavasour is 678 feet, which agrees with his map of the previous year. If the Bakery and the Bastion were built at this time, as indicated, the length of the fort should have been 733 feet. Apparently Vavasour failed to include the 56-foot measurement on the east side but showed that area on the plan. If the "Line of Fire" map of 1844 is correct in showing the Bakery on the east wall, that addition had already been made before Warre and Vavasour arrived in 1845, but the 18-foot addition on the west had not as yet been made. The length of the fort at that time should have been 715 feet. It is believed that by the end of 1846 the length of the fort had been increased to 733 feet. If a small bastion was built on the south-east corner it was done at this time. By 1851 when Gibbs made his drawing this bastion had disappeared. One reason for its removal may have been the addition of the final outer wall along the south side of the fort.

For convenience the following table has been prepared to show what is believed to be the correct measurements and sequence in the construction of the stockade walls of Fort Vancouver and the authority upon which this information is based:

Date	Length	Width	Source
1829	318	318	Jedediah Smith
1836	638	318	Samuel Parker
1841	638	318	George F. Emmons
1844	715	318	Line of Fire map
1845	715	318	Warre and Vavasour
1846	733	318	Vavasour
1851	733	323	George Gibbs

The above data have been made up from the results of the archaeological findings and should not be confused with the dimensions listed in the previous table.

A R T I F A C T S

The amount of artifact material recovered from the excavations at Fort Vancouver is almost unbelievable. As the main depot for the Company's activities west of the Rockies to which all goods from England were sent, it received great quantities of materials of all kinds in order to carry out the fur trading, lumbering, agricultural, shipbuilding and repairing, and fishing pursuits of the Company. One has but to inquire into the way of life in those days in England to realize that the people living on this far-away frontier were receiving all of the advantages of England's industrial growth. In 1822 the Hudson's Bay Company arranged to have trade and domestic goods brought directly from England to Fort George. Thereafter, annual supply ships were sent to the Columbia with goods and materials needed in the rapidly expanding fur trade and agricultural developments.

Since the area where the Hudson's Bay Company fort was located was continuously occupied after its abandonment by the fur trade personnel, it is only natural that many objects other than those used in the trade would be found. The area was used by the United States Army and still is since that day in June 1860 when the small group left the old fort on the small vessel, The Otter. It had been used for many years previous to the coming of the white men by the native population. They did not have a village here but in their hunting and traveling back and forth over the area arrow points and other evidence of their passing were accidentally left.

From contemporary accounts and from letters and reports from Fort Vancouver to the Governor and Committee of the Hudson's Bay Company, we know that this emporium was a beehive of activity for many years. Much of the material received from England must have been iron in standard shapes and sizes. It was processed at Fort Vancouver and other smaller inland posts into the much-needed trade items used in procuring furs and food and into the necessary hardware used around the forts. The amount of scrap and the number of worn-out tools left from the blacksmithing and ironworking at Fort Vancouver are evidence pure and simple of this great activity.

In Governor Simpson's outward correspondence book we find copied a letter dated October 6, 1825, at Fort Vancouver, from Dr. John McLoughlin, in which there are 64 numbered paragraphs relating to conditions at Fort Vancouver during the summer of 1825. The William and Ann, of about 161 tons, the first supply ship to bring goods to the Columbia after the establishment of Fort Vancouver, had cast anchor opposite Fort George on April 11. 22/ This vessel was only one of many which supplied

22/ H.B.S., IV, 1-22.

the strategic post ninety miles up the Columbia River. She had been built in Bermuda in 1818 and purchased by the Company in 1824. She made two successful voyages from London to the Columbia from 1825 to 1828. In March 1829 on her third voyage she was wrecked on the bar of the Columbia with a total loss of her crew and cargo.

McLoughlin reported on her first voyage to the effect that part of her cargo was wet. The dry-goods were not injured, but the barrels of flour and meal were in such condition that about a seventh was bad. The gunpowder was damp but apparently usable. The pork and beef in barrels were not good and the bricks were of an inferior quality. This first cargo gives a pattern of the many which followed. These cargoes included everything necessary for the fur trade for one year and were called outfits.

The William and Ann required repairs after arriving at the Columbia. As soon as she was seaworthy she was sent on a coastal trading reconnaissance north to determine the possibilities of that phase of the fur trade before returning to London.

On June 1, 1826, the Dryad arrived and was unloaded. McLoughlin reported that the Indian corn was injured by insects. The report on the iron for beaver traps was that "3/8 inch square scrap is of a worse quality than any hitherto sent which causes a Great Loss as by the Breaking of traps the Hunters cannot make the Hints they would." 23/ He sent other remarks on the state of the cargo, which as yet have not been found.

On May 28, 1828, the brig Eagle, 193 tons, arrived at Fort Vancouver. 24/ This vessel carried the outfits from London and brought back the returns of the trade until 1836 when she took the York Factory run. She was wrecked that year near the entrance to Hudson Strait. McLoughlin makes no mention of the cargo in 1828, except for the fact that the Company had not sent the outfit for 1829 at the same time as had been requested so the fort would be self-sufficient a year ahead in case of future loss of an annual outfit.

From these brief accounts of the annual arrivals of the goods we know that huge quantities of supplies reached Fort Vancouver to be used for various purposes, including goods used by the Company in the regular operation of business, gratuities for Indians, and supplies and goods for employees' personal requirements. The descriptions of the many artifacts from the excavations will be taken up by groups of closely related goods used in the trade and for the many other purposes necessary at that time.

Iron Objects

The amount of iron which was unearched during the excavations from 1947 to 1952 is almost inconceivable. Since the scrap and rejected items were never disposed of until the final abandonment of the fort, there was a huge quantity that must have accumulated around the Iron Store and Blacksmith Shop. Most of this must have been dumped in Well No. 1 and the

23/ H.B.S., IV, 25.

24/ H.B.S., IV, 55.

Fig. 7. Sizes of Iron Strap and Bar

		W I D T H																	
		1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	2	2 1/2	3	1 1/2	
T H I C K N E S S	1/16	x	x	x	x			x	x	x	x	x	x						
	3/32							x				x				x			
	1/8	x					x	x	x	x						x			
	3/16									x									
	1/4	x		x			x	x	x	x	x	x		x				x	
	3/8		x	x		x	x	x	x	x	x	x		x	x	x			
	1/2			x								x	x	x		x	x		
	5/8				x													x	
	3/4					x											x		
	7/8						x										x		
1							x										x		

Root Store at the time of abandonment, but several thousand pieces were found in the southeast section of the fort, spread all over the area. Thousands of pieces still remain in the unexcavated portions of that area and still more in other parts of the fort. The following summary gives only the iron count for the four years' excavations:

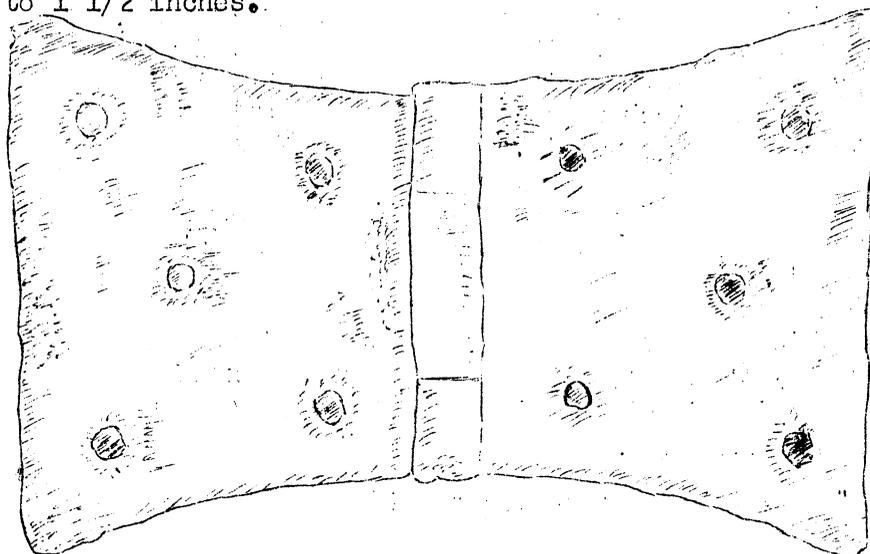
1947	3,355
1948	7,767
1950	20,490
1952	<u>64,234</u>
Total	<u>95,846</u>

In addition to the above record several thousand more iron objects must have been scraped from the surface for the airport runway and hauled away before the excavation began. Three known levelings of the airport were made and each time 30-40 five-ton truckloads of earth were removed and dumped in the lower airport area to raise the lower runway.

Undoubtedly the site of the fort was a favorite place for the collection of scrap iron from its abandonment to 1947. During this period many pieces found on the surface must have been taken away for re-use and as relics.

It appears that iron was shipped from England in standard sizes in strap (flat), rod (round), bar (square), sheet and plate. The processing of iron seems to have been well developed as the sizes drawn in sixteenths and eighths are accurate. The chart (Fig. 7) shows the various sizes of bar and strap iron found during the excavations.

From this chart we find there were at least 49 different sizes of strap iron and 7 sizes of bar iron. There were also 7 thicknesses of sheet or plate iron ranging from 1/32 inch to 1/2 inch in thickness. Rods were found to have come in ten different diameters ranging from 1/4 inch to 1 1/2 inches.



Analysis. The iron objects which could be identified will be listed in alphabetical sequence and described. It must be remembered that in almost all cases the objects found had been discarded because of having been worn out, broken or rejected after faulty manufacture at the fort. Very rarely was a whole item found unless it was something small which had been misplaced or lost.

Adzes. No woodworking adzes were found, but several pieces of iron shaped similar to the stone adz blades used by the natives were recovered. It was very common for the Indians to make this substitution and many examples may be seen in museum collections in Alaska and the Northwest. Occasionally they even went as far as to flatten the head of a trade axe and use it as an adz blade. Evidently the Company realized this need and had them made for use in the trade.

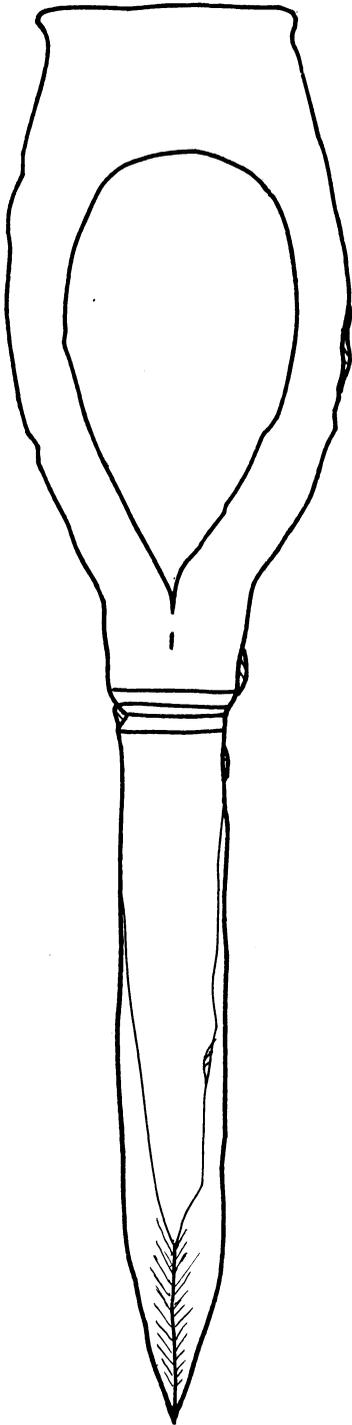
Axes. These tools were not found in any quantity, but from those found it appears that a number of different sizes had been made of two styles. The larger axes have been called the Hudson's Bay Company type. Because of their weight and size they must have been used mainly around the forts for construction and maintenance and the supplying of firewood. They have a shape (Fig. 6) which is distinct and could never be mistaken for any other type of axe of the same period. A number of perfect specimens appear in collections in museums of the Northwest. One in the Oregon Historical Society Museum has the letters JB deeply stamped on one side. Other markings, probably of the manufacturer or distributor, also are stamped on some of the axes, but cannot be read.

The trade axes were not common in the excavations but must have been made by the thousands for barter. Not a single good specimen was found. However, they are numerous in collections in the Northwest. From the examples found it was possible to determine the way in which they were made (Fig. 8). About fifteen inches of standard $\frac{3}{8}$ inch by $1\frac{3}{4}$ inch strap iron was first bent over a form. To this was added a piece 1 inch by $1\frac{3}{4}$ inches on its center portion to make the axe head. The sides were then joined, the hole for the handle formed, and the blade portion was widened and brought out to an edge. For the final step, a piece of steel was welded to the blade. The trade axes as found were made in four sizes according to the width of the material used: 2 inches, $1\frac{3}{4}$ inches, $1\frac{1}{2}$ inches, and $1\frac{1}{4}$ inches in width. It appears that the head was not always added to the smaller models. Only fourteen parts of trade axes, consisting of examples discarded by the blacksmiths, were found. Various shapes of trade axes are fully illustrated in The Beaver of September 1914 and mention is made of half axes also, showing that they were made in at least two sizes. 25/

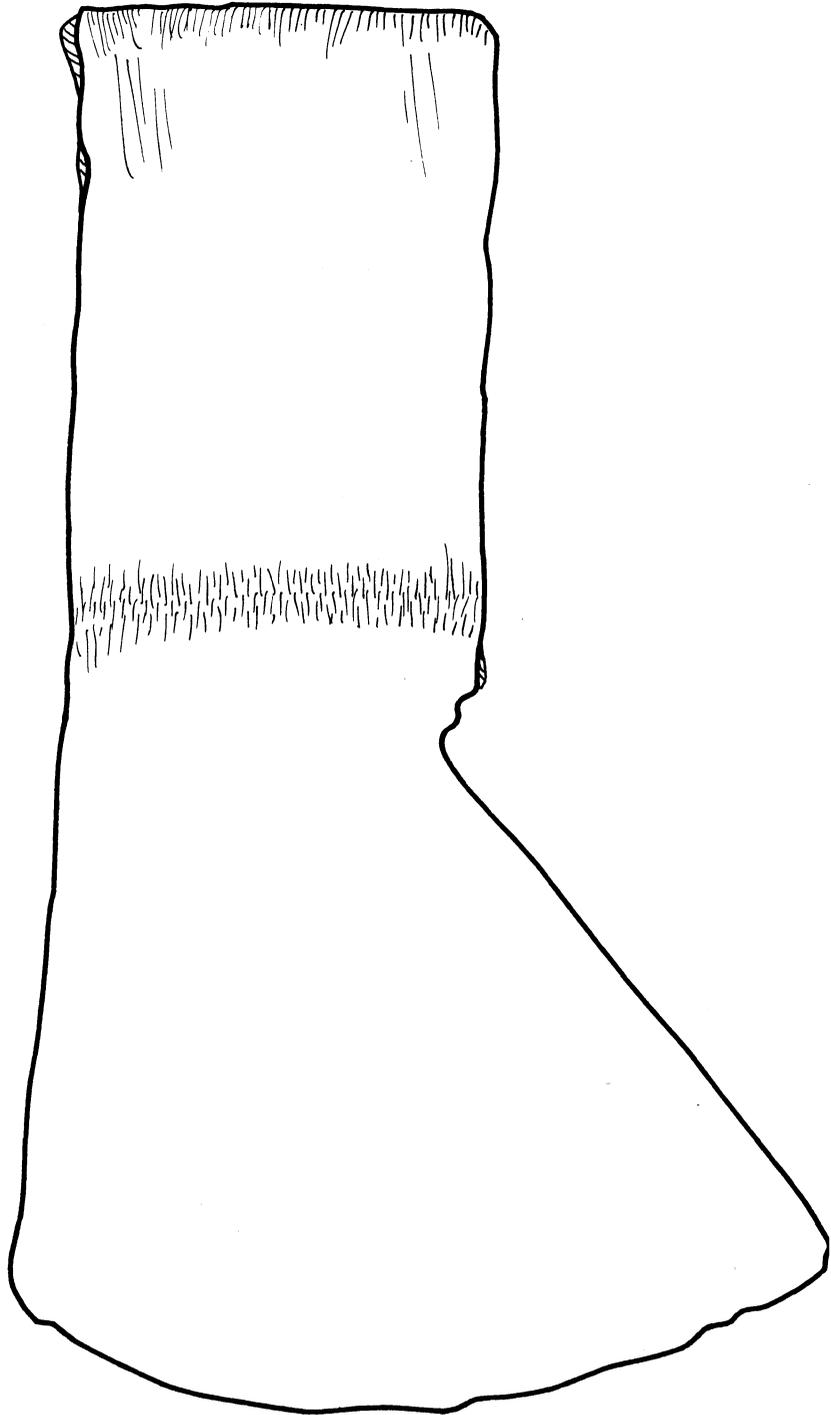
Figure 8 (The Making of a Trade Axe) shows the various steps necessary in the manufacture, from examples found during the excavations. Three views of each process are shown, front, side and perspective. The

25/ Barbeau, "Country Made Trade Goods," 18.

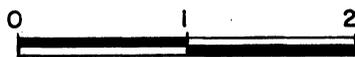
FIGURE 6 - TYPICAL HUDSON'S BAY AXE



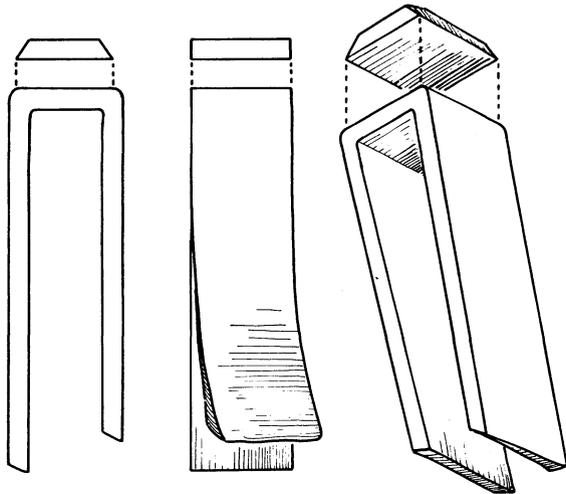
END VIEW



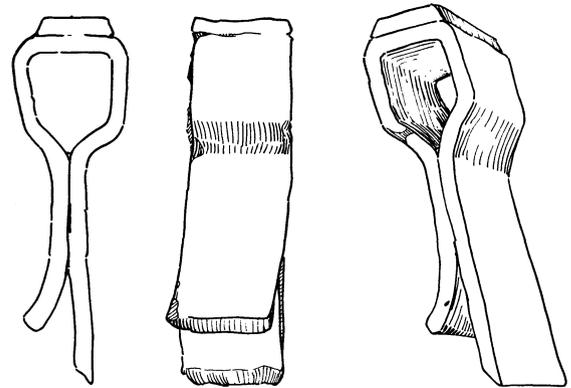
SIDE VIEW



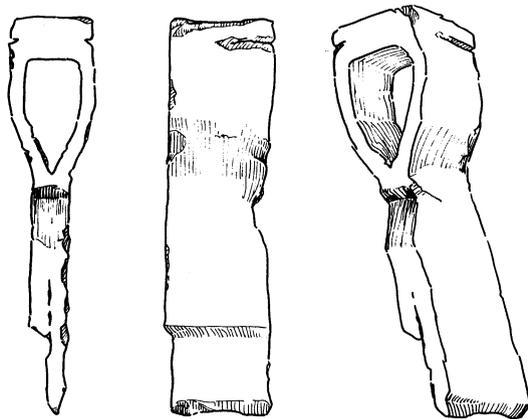
Scale in Inches



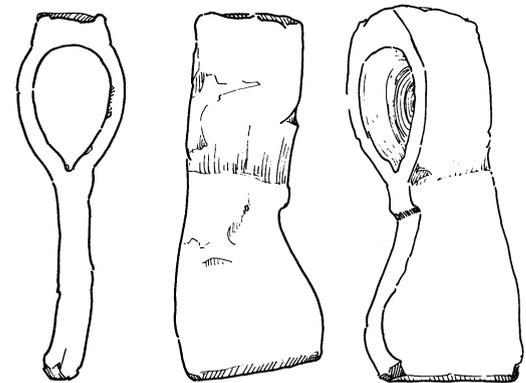
A. About 15 inches of $1\frac{3}{4}$ " strap iron is bent and square head made.



B. Head tapered and welded on. Body shaped and hole formed.



C. Blade welded and notch formed.



D. Blade shaped ready for sharpening.



Figure 8. The Making of a Trade Axe (from actual specimens)

sketches were made from different specimens and this accounts for the varying lengths and shapes. It must be remembered again that no perfect specimens were found. In Figure 8, D, a discarded trade axe was used to show how the completed tool might have appeared before sharpening.

Augers. Two fragments of one and one-quarter inch ship augers were found. In the shipbuilding and repairing, in the heavy gate and wall construction, and in other construction work augers of various sizes must have been in constant use.

Bayonet Bases. Two "bayonet bases" from which the blades had been cut were recovered. Whether they were of British or American origin was not determined. They are the portions which fitted over the ends of gun barrels.

Bolts and Nuts. This term includes a number of kinds of objects called by that name. All of the threaded bolts had been made from standard iron bar or stock of several diameters, with threads varying from $\frac{1}{4}$ to 10 to the inch on the half-inch rod. The bolt heads were square, round or projecting from two sides (Plate XV) and varying in thickness from one quarter to three quarters of an inch. Nuts for these bolts showed some variation in size ranging from one half inch to two and one-half inches square and from one quarter to three quarters of an inch in thickness. No taps or dies were found, but undoubtedly they had these and made many of the bolts as needed for specific jobs. Following is a list of the various sizes of nuts found during the excavations:

$\frac{5}{8}$ " sq. x $\frac{5}{8}$ "	-	$\frac{1}{2}$ " hole	-	1
1" sq. x $\frac{1}{4}$ "	-	$\frac{3}{8}$ " hole	-	1 (trap nut)
$\frac{1\frac{1}{4}}$ " sq. x $\frac{3}{8}$ "	-	$\frac{1}{2}$ " hole	-	1
$\frac{1\frac{1}{4}}$ " sq. x $\frac{3}{8}$ "	-	$\frac{5}{8}$ " hole	-	1
$\frac{1\frac{1}{2}}$ " sq. x $\frac{1}{2}$ "	-	$\frac{3}{4}$ " hole	-	3
$\frac{2\frac{1}{2}}$ " sq. x $\frac{3}{4}$ "	-	1" hole	-	1

Door and gate bolts had been made at the fort. Some of the smaller ones may even have been chest or box bolts. For handles the ends had often been turned up or a small pin inserted in the shaft of the bolt.

Bridle Bits. A number of pieces of broken low-port bits were found. These probably were from the American army period. One example of a broken brass bit was unearthed which is identical in shape and construction with those made of iron. No snaffle bits appeared.

Buckles and Harness Hardware. Iron buckles of many sizes and shapes came from various places within the fort. D-shaped rings and other shapes of connectors obviously used for harness and saddle rigs were quite numerous. Many of these came from the location of the harness shop.

Buttons. Numerous buttons of thin stamped sheet iron were found. Very few were in condition to be studied because of having rusted so badly. All appeared to have four holes except one which had been riveted. The latter was found with a bib overall hook attached and probably was of the American period.

Cans and Cannisters. These thin-walled containers were found in very fragmentary condition, especially in the American period of Well No. 1. Some had lead soldered seams and showed traces of tin plating. One fairly well preserved measuring can (Plate XIX) of about one quart content was in good enough condition to be photographed. Measuring containers came in sizes from one gill up to one gallon.

Candle Snuffers. Two parts of iron candle snuffers operated like scissors were found. Apparently candles were much used for lighting since parts of oil lamps do not appear until the later period.

Cannon Balls. Cannon balls came from all over the fort area. Two sizes were found measuring three and one-half inches and four inches in diameter. The smaller size weighed five pounds fifteen ounces and the larger weighed eight pounds fifteen ounces. They possibly may have been the ones piled next to the cannon in front of the Chief Factor's residence and later were scattered around the fort. Three-pound cannon were reported to have been in the bastion, but no three-pound shot were found.

Chain. Chain of all kinds was found in all parts of the fort. A number of pieces of chain used on traps came from around the area of the trade store and blacksmith shop. Some of the larger chain may have been part of the equipment used on the vessels carrying overseas supplies. One section (Plate XVI) is different from the usual type in that the links are reinforced with cross pieces.

Chest Handles. Hand wrought chest handles in three sizes were found. Very fine chests were brought from China and England or made here for the trade. Stikine Indians living at Wrangel, Alaska, are reported to have in their possession a number of chests secured from the Hudson's Bay Company. Two large chests in the study collections of the Portland Art Museum appear to belong to this period. Heavy iron handles were also made for iron chests and safes.

Chisels. Three types of chisels were made at the fort. Wood-working chisels, chisels for stone work, and chisels for the cutting of iron were all in common use. One very fine example of a wood chisel, one inch in width, is very similar to chisels used by carpenters today. This particular specimen has a name stamped on one side which cannot be deciphered. Stone chisels for sharpening burrs and for masonry work around the fort were common.

Corkscrews. Several fragments of corkscrews were found. From the amount of bottle goods used at the fort corkscrews must have been a necessary utensil.

Door and Gate Hardware. Latch and door plates, door locks, bolts, escutcheons, hinges, and other door and gate hardware were very common. Most of those found were roughly made but some showed finer finishing. The latter probably had been used for the gentlemen's quarters.

Drills. Several fragments of metal drills were recovered. From the study of the holes made in much of the iron it would appear they generally were made with punches, but some were made by drilling.

Files and Rasps. Broken parts of files and rasps were common. Parts of files from seven half round examples in three sizes are in the collection. Two parts of rasps and three parts of flat files were found.

Forks, table and kitchen. These eating implements were fairly common. They appear in two and three tyne styles. Both kinds had bone handles typical of the cutlery coming from England. They were in common use in all of the fur trading posts, having been found in the excavations of Fort Spokane, Fort Walla Walla and Fort Okanogan.

Funnel. One large sheetiron funnel measuring 16 inches in diameter and 16 inches high came from Well No. 1. This huge funnel (Plate XXI, A) must have been used in transferring liquids from one cask to another.

Gouges. These tools, all fragmentary except one specimen, were well made. They must have been a common tool for that period since so much woodworking was done in the carpenter shop and around the buildings.

Grape Shot. Grape or cannister shot were very common in two sections of the fort, the southeast and northwest. They were of four different sizes, 1", 1 $\frac{1}{4}$ ", 1 3/8", and 1 $\frac{1}{2}$ " in diameter. A total of seventy-eight specimens was found. These iron balls were for use in the small cannon reported to have been in the northwest bastion. The fact that they were also found in the southeast corner would be additional evidence that a bastion had been located there at one time.

Hammers. Three handmade claw hammers were recovered from Well No. 1. One small cast iron hammer of doubtful provenience was found on the surface. The latter is probably from a later period. One shoemaker's hammer was found which has been illustrated in the report of the work done in 1948.

Handles. Worn out and broken handles from kettles and metal containers were numerous. Many of these were of heavier material than the utensils to which they had belonged. Bales of various sizes were quite numerous but whether they had been on buckets or copper kettles is not known. Very few parts of sheet metal containers which might have been buckets were found. Since so many barrel hoops have been found, it is very possible the containers used for many purposes around the fort were small casks.

Harrow Teeth. Examples of what appeared to be harrow teeth were rather common. It is possible they were for some other purpose which is not known. They were made of 5/8" square iron stock and were 8 inches in length. On each one the blacksmith had made small barbs on the edges in order that teeth when placed in a wooden frame would not drop out.

Heel Plates. A few heel plates were found. Most of the boots found were heavily nailed around the heels, probably for longer wear, but apparently heel plates were sometimes applied.

Hoes. Two broken garden hoes were found. Bruce, the gardener, undoubtedly had a goodly supply of these tools.

Hooks. Hooks of all kinds, large and small, were recovered. Some were beautifully made, while others were rather crude. These included hooks for chains, hooks to be driven into walls, meat hooks, and hooks for holding sheave blocks.

Hoops. The use of wooden casks was one of the most common methods of shipping and storing items at that time. McLoughlin mentions the receipt of shipments in casks and their re-use for the shipment of articles to the Sandwich Islands, to England and other parts of the west coast. Outside the southeast corner of Fort Vancouver was the Cooper's Shed where casks were made. This building was not excavated, but evidence from the interior of the fort was proof enough that cask-making was an important trade at that time. Another cooper's shop is shown near the lagoon in Covington's map of 1846.

The smallest hoops found were made of 1/16" strap iron, 5/8" wide. The largest complete hoop was made of 1/8" stock and was 1 1/2" wide and 36" in diameter. The overlap varied from two to six inches, depending upon the diameter of the hoops. Two or three rivets were used for fastening the hoops together.

Kingpins. Many pins or axles for sheave blocks came from all the excavations. Some were made with small rectangular openings in which keys would have been driven.

Knives, kitchen and skinning. A number of badly rusted but complete knife blades were found which were in the shape of kitchen and skinning knives. The handles were probably of wood because bone would not have deteriorated beyond recognition.

Knives for the trade were listed as scalping knives and some of the above may have fallen under such a classification at that time.

Knives, pocket. Seven pocket or folding knives, as they were then called, all badly rusted, came from trash pits, so there was no doubt that they belonged to that period. Pieces of pocket knives were also found in other places and may have belonged to the early American period.

Locks and Keys. The profession of locksmithing was highly skilled from the examples found. The iron locks, padlocks, and keys excavated were not too well preserved, but other specimens donated to the Fort Vancouver Museum by local residents are certainly beautiful examples of workmanship. The keys were ornamental in shape (Fig. 10) and some may have had appropriate decorations bearing reference to similar decorations on the locks for which they had been made.

Iron door and gate locks were numerous but in very poor condition. The mechanisms were so full of dirt and rust and so fragile they were almost impossible to clean without damage. The padlocks were made of heavier material and were in somewhat better condition. None of the door or gate locks were in a condition to be illustrated, but one padlock (Fig. 9) was sketched to show its shape and size.

Almost all locks, including the padlocks, were fitted with brass keyhole escutcheons, no two alike, which are of the shapes of the keys which fitted the various locks.

Many keys for door locks and padlocks were taken from trash pits and other areas. The door keys were usually about 3 1/2 inches in length. The padlock keys averaged 2 1/2 inches. Keys from the American period of trash from Well No. 1 were long, thin examples, averaging 5 inches in length and entirely different in workmanship from the Hudson's Bay Company specimens.

Mattocks. Two small mattocks may originally have been intended for use in the garden. One shows long use while the other is only the blade and appears to have been broken while being made. The complete specimen clearly shows the method of manufacture. A piece of 1/4" x 1 1/2" strap iron about 18 inches long was bent similar to the first process in the making of a trade axe. One side was then heated and bent at right angles. The other was bent at right angles but in the opposite direction. These bent portions were then fused together and beat into the blade. The opening was then shaped to receive a handle and bent at the right angle.

These examples measure nine inches long by four and one-quarter inches at the widest part of the blade. The handle openings were very well formed.

Muskets. The history of the Hudson's Bay Company and their peaceful relations with the Indians has been closely linked with the judicious trading of firearms. Their policy was to be very cautious in letting the Indians procure muskets unless they were positive of their peaceful use in the trade. On the other hand, American traders, especially along the northwest coast, were prone to trade muskets of poorer workmanship at a lower trade value than did the Company.

At this time firearms were being made for the Hudson's Bay Company by several companies, including a London gunmaker by the name of E. Barnett, part of the firm of Barnett & Son and Wm. Wilson.

James Douglas in writing to the Governor of the Honorable Company in 1839 stated, "Guns exact counterfeits of our own, even to the maker's name Barnett being inscribed upon them, went for a beaver each." 26/ The usual standard of trade for the common North West gun was about 20 or more beaver skins each. We do know that this type of musket was being manufactured in England by J. E. Barnett & Sons, with the side or screw plates made in the form of brass dragons with very pronounced circles near the tails. These North West guns were favorites of the Indians. They were short, smoothbore muskets made especially for the trade. Contrary to popular belief, the common trade gun was not made with an extremely long barrel for which the Indian had to pile beaver skins as high as the gun before it was his. The short gun was easy to handle, especially in hunting game from horses where quick firing and reloading were necessary. Three such guns with two short bows were found during the excavation of a burial at Fort Spokane. 27/ They were stamped on the lock or the barrel or both with a fox, seated, facing the left (similar to the Company's crest), and surmounting this were the initials "E. B." 28/ We also know that orders were being placed by the American Fur Company between the years 1828 and 1835 with a number of gunsmiths in Pennsylvania for exact copies of North West guns even to specifications for the mark "Barnett." The American Fur Company was, of course, capitalizing on the type of musket desired by the Indians. In 1829 it was found that such guns could be obtained more cheaply abroad and orders for large quantities were placed in England and Belgium. 29/

Nails and Spikes (Plate XV, B). The greatest number of any one kind of object found was that of nails. They appeared by the thousands in sizes ranging from less than an inch to more than ten inches in length. They were manufactured in England and also made by the blacksmiths at the fort and at other forts. They were made from standard rod, the smallest three-thirty seconds of an inch square, and the largest five-eighths of an inch square. Nails fall into several distinct types in addition to the many handmade varieties. An interesting study could be made of just this one type of object.

Ploughs. A considerable number of iron objects turned up, especially in Well No. 1, which were used in tilling the soil. Many of these were portions of ploughs, especially plough share irons. All examples appeared to be worn out. It is interesting to note that McLoughlin from 1829 through 1831 mentions plough share irons in lists of materials and equipment. Twelve were requisitioned from England under date of October 19, 1831. 30/

26/ H.B.S., VI, 213.

27/ Caywood, Archeological Excavations at Fort Spokane, 53-56.

28/ Gooding, 31.

29/ Parsons, 183-85.

30/ Barker, 233.

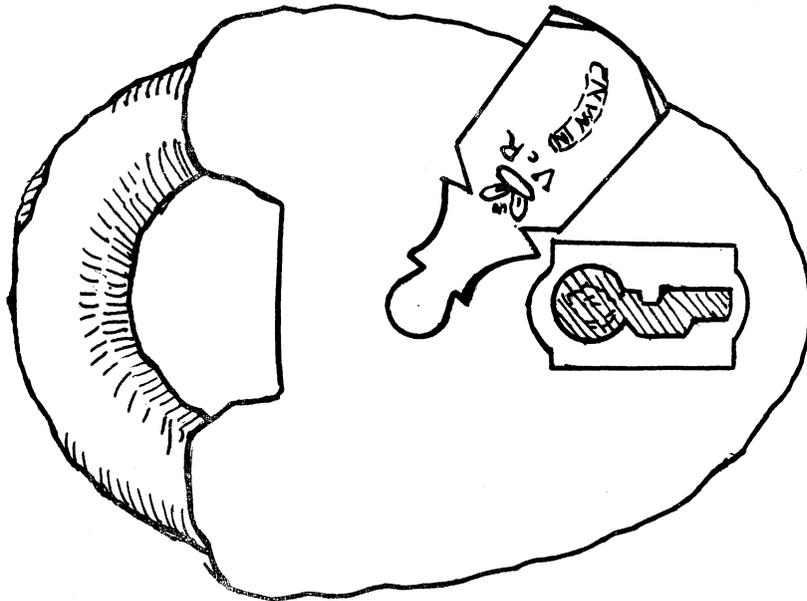
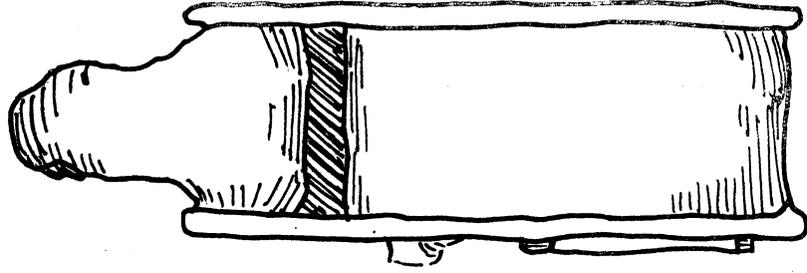
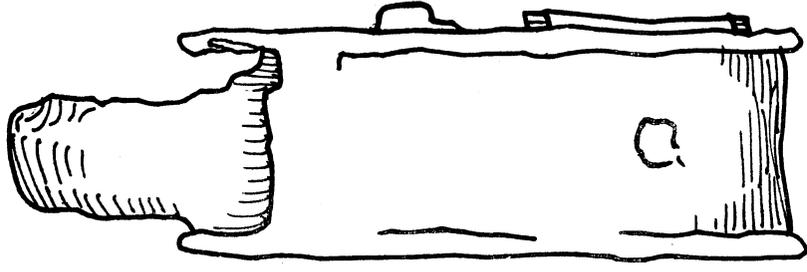


FIGURE 9—IRON PADLOCK WITH BRASS KEYHOLE ESCUTCHEON AND COVER
(Natural size)

IRON KEYS

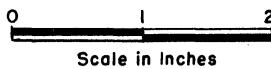
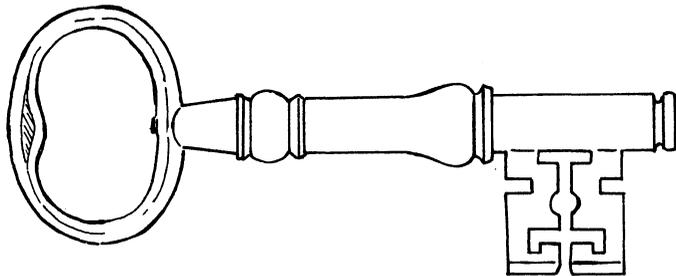
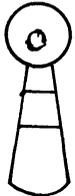
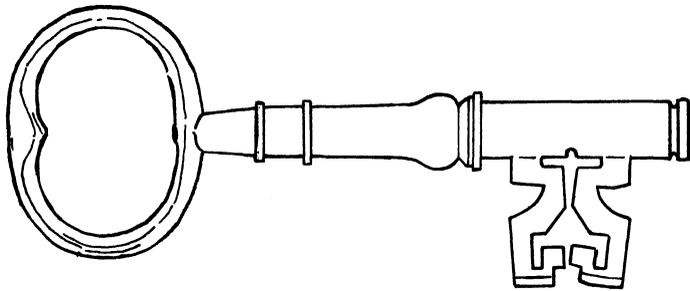
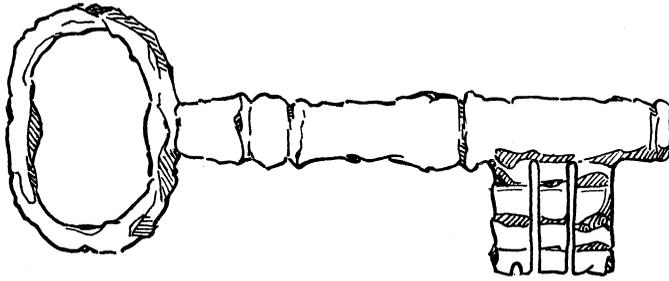
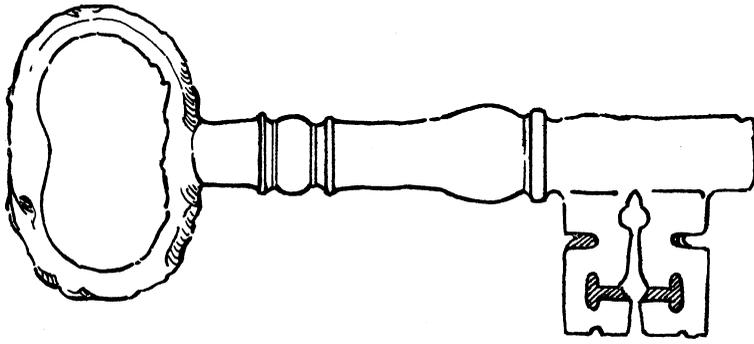


FIGURE 10

Shoes, horse and mule. Exactly one hundred specimens of horse and mule shoes were found. Many, of course belong to the American period. Some appear to be rather crudely made and others are very well made.

Staples. Handmade staples apparently were made for individual uses from the number and variety of sizes and shapes found. Many apparently from their size were intended for use in fastening gate and door hasps to wood.

Scythes and Sickles. Small sickles with crescent-shaped blades were common. From the different sizes and shapes many could have been made at the fort.

Scythes, probably used in cutting the wheat, oats and other grains planted near the fort, were common. Thin blades, three inches wide, were made with a backing of heavy iron about one inch wide by one-half inch thick near the handle. They tapered down to about one-quarter inch square or less at the tip. An arrangement on the other end was for attaching a handle at right angles to the blade.

Complete scythes probably measured from three to four feet in length. An expert blacksmith probably could have made such an item, but it is much more probable that they were manufactured in England.

Stoves. Many broken parts of stoves were uncovered. Usually, if a building had a plaster or dirt floor, a platform had been built of brick or stone set in mortar to support a stove. In the Priest's House, for example, a stove had been placed in one end of the building and a fireplace in the other. No portions of stoves were found in such shapes or sizes as to permit determination of the appearance or size of any particular example.

Thimbles. A number of thimbles for reinforcing rope loops for suspending heavy sheave blocks had been in use. Probably many of these were equipment from sailing vessels. They were circular in shape and came in various diameters from $1\frac{1}{2}$ " to 3".

Tin Roofing. During the excavation of the Wheat Store, Well No. 1 and the Root House, quantities of tin, twelve inches square, with interlocking edges were found. In Well No. 1 and in the Root House these tin squares were piled in as trash. However, in the Wheat Store they were found in place, either as part of the roof or as covering for storage bins, but probably the former. Many of the sheets were interlocked and still had the hand-wrought one-inch nails in place which had held them in position on the roof.

A study of the photograph of the western part of Fort Vancouver made in 1860 clearly shows a type of roofing used on the Wheat Store which could well have been these tin sheets in place. A waterproof roof was certainly a necessity on a structure used for the storage of grain.

In the additional requisition per the Ganymede from England made in 1831 by Dr. John McLoughlin was listed an item for, "100 Box of Tin for covering roofs." 31/ Apparently this would arrive in outfit 1834 which would be delivered in the summer of 1833. It was not until 1838 that James Douglas reported that a new granary had been constructed.

Tongs, blacksmith. In all, a total of 69 parts of blacksmith tongs was found. These were all broken or discarded. The handles had been cut off all specimens, so the handle length is not known. They range in size (Plate XVI, B) from a huge example with a jaw measuring $6\frac{1}{2}$ " x 3" to the smallest one which was 2" x $5/8$ ". They came in largest numbers from two localities within the fort, the blacksmith shop and Well No. 1.

Trap Parts. The quantity of traps on inventory at any one time for all the posts of Columbia District must have been several thousand. We find that, "In order to enable Ogden to lay waste the Snake Country as a fur-bearing area (on the principle that if you make a country a desert, you may call it peaceful), Simpson gave him the strongest party that had ever 'set out for the Snakes.' It comprises '25 lodges, 2 gentlemen, 2 interpreters, 71 men and lads, 80 guns, 364 beaver traps, 372 horses.'" 32/

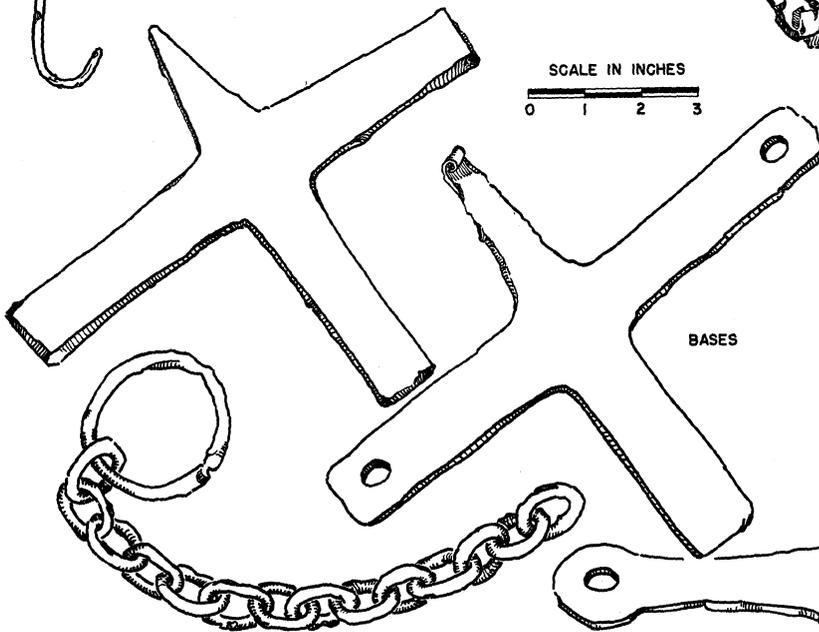
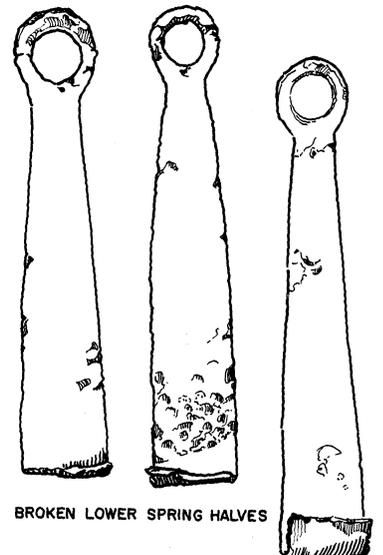
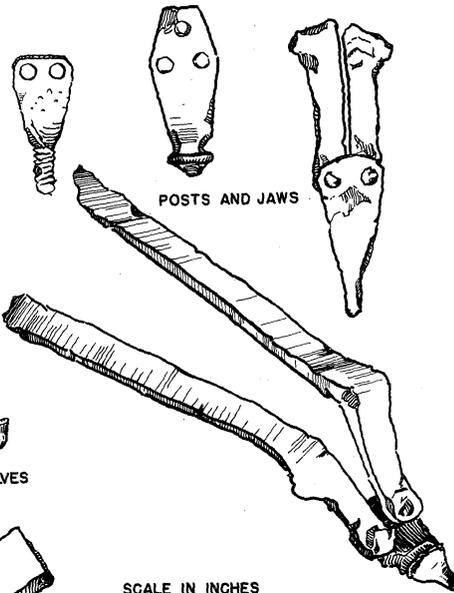
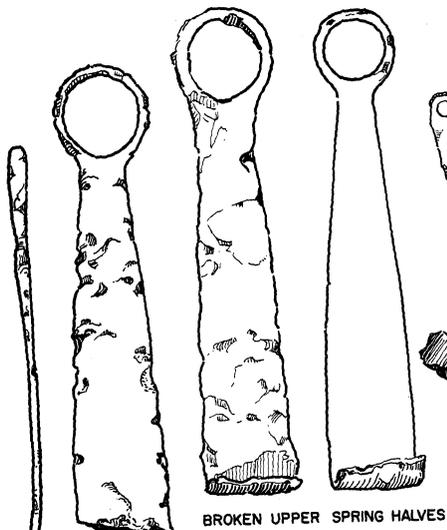
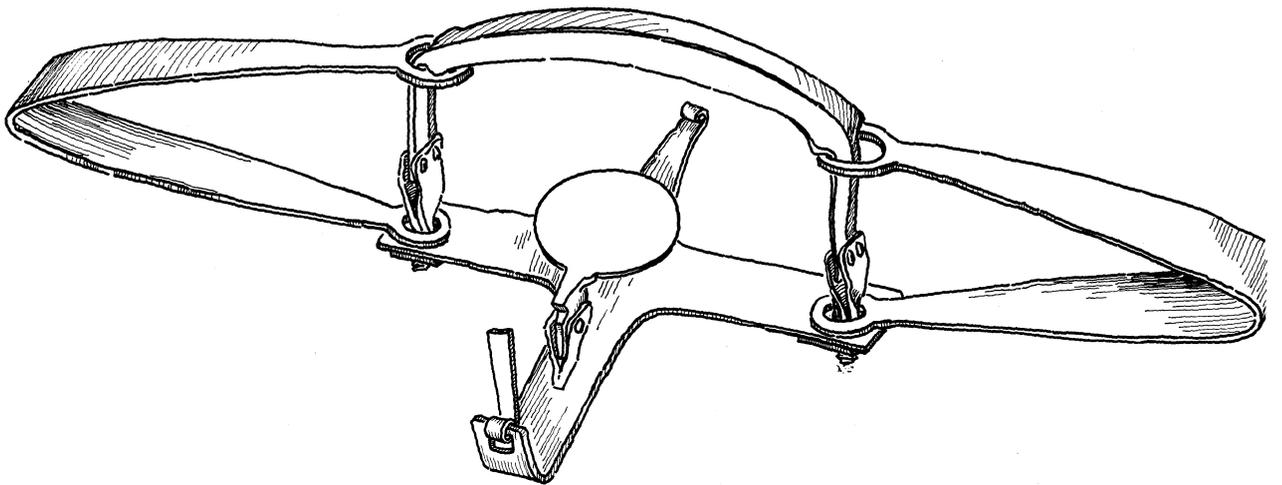
At first one would believe that many whole traps might have been left at Fort Vancouver, but after four seasons' excavations it is still difficult to determine the exact kinds of traps made there and used by the fur trade from the few broken parts found. The finished products probably were moved to the outlying posts and as time passed were broken, lost, buried, stolen and discarded until it is now very difficult to find a complete trap dating from the fur trade period. Figure 11 shows broken trap parts found during the excavations and a trap "reconstructed" from the parts found. In all, 92 broken and 3 complete springs were found. Examples of trap parts were sent to the Animal Trap Company of America in Lititz, Pennsylvania, for possible identification and comments. After a careful study of the parts, the following conclusions were reached by their staff:

1. Whole spring (Catalog No. 1/120) - there is every reason to believe it is one from an early hand-forged No. 4 Newhouse trap.
2. The pan (Catalog No. 1/52) and cross (Cat. No. 1/53) may have been from Newhouse traps; they may also have been those from other makes. They are undoubtedly of American manufacture.
3. The second spring (Catalog No. 1/111) is doubtless of American manufacture.

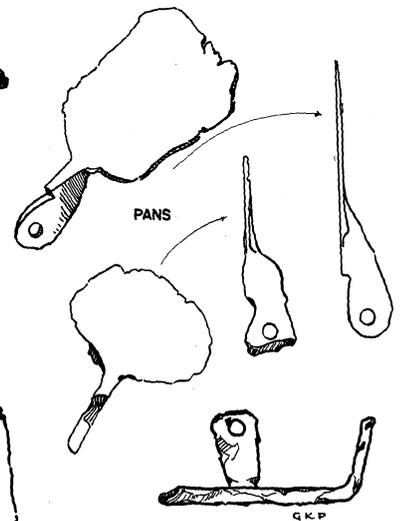
31/ Barker, 233.

32/ H.B.S., X, xli.

Figure 11. Beaver Trap and Parts



SCALE IN INCHES
0 1 2 3



The Animal Trap Company of America is greatly interested in the history of traps and maintains a large trap museum. It is curious to note that the trap parts found at Fort Vancouver and at the sites of other Hudson's Bay Company posts are so very similar to the early hand-forged No. 4 Newhouse trap that they could be identified as such. However, the handmade American trap from which the Newhouse trap was finally standardized was being made over a wide area long before Newhouse began his business. The type of trap he used as a pattern was accepted as the best in use at the time. It is the opinion of the writer that all trap parts found at Hudson's Bay Company posts were shipped from England or made by personnel of the Company. Although differing slightly in size and shape because of hand manufacture, they all appear in general to be of the same style. Analysis of the iron of traps known to have been made in this country as compared with those found at Fort Vancouver might be the determining factor in locating the provenience of the metals from which the traps were made, provided the iron in the American-made traps was of American origin. A study of traps in museums of the Northwest failed to unearth any trap which was identical to the beaver trap parts found at Fort Vancouver. A few traps have been cataloged as being Hudson's Bay Company traps, but comparison did not prove this assertion to be correct.

Traps were made in at least two sizes. The spring length varied from about $16\frac{1}{2}$ " in length to more than 19". Since they were all handmade, there are slight variations in each size. They were made from $1\frac{1}{2}$ " and $1\frac{3}{4}$ " by $1/8$ " or $3/16$ " strap or plate, probably strap. The holes in the spring for the jaw post were made large enough to slip over that part of the trap, usually $5/8$ " to $3/4$ " inside diameter. The upper spring opening which closed the jaws was from an inch to $1\frac{3}{8}$ inches inside diameter. The trap springs of which only 3 complete examples were found show considerable variation in size and workmanship. From the complete springs and from 93 broken springs the average length from the bend to the ends ranged from $7\frac{7}{8}$ " to $8\frac{5}{8}$ ". These probably all were made for the same size trap. A smaller size measured $7\frac{3}{8}$ " in length. This probably would correspond to the No. 3 Newhouse trap of today.

The trap parts found all seemed to be more or less uniform in pattern although some variations do occur. Apparently the so-called "beaver trap" was as close to a No. 4 Newhouse trap of today as could be made by hand. In McLoughlin's letter of September 1, 1826, to London, he states that the $3/8$ " square scrap was of a worse quality than hitherto sent. ^{33/} This would mean that many, if not all, of their traps, even in this early period, had been made at Fort Vancouver. In another letter from McLoughlin dated October 31, 1841, ^{34/} we find that he was sending an improved pattern for beaver traps to be substituted for the one already in England. Traps of American manufacture were found to be of a better design than those being made by the Company and McLoughlin was recommending a change to this type. After Simpson's move for economy many items, including traps, were made in Canada for use by the Company. ^{35/} See Figure 11 for a reconstructed trap and parts.

^{33/} H.B.S., IV, 25.

^{34/} H.B.S., VI, 92.

^{35/} Barbeau, "Country Made Trade Goods," in The Beaver, Sept. 1944, 19.

Very few jaws and bottom parts of traps were found but enough were recovered to make possible a drawing of what a typical Hudson's Bay Company beaver trap looked like. Trap bottoms of two sizes were found. From center of jaw post hole to center of jaw post hole then measured $7\frac{1}{2}$ " and $8\frac{3}{4}$ ". One trap jaw measures 8" across from end to end, which probably means a third size was made.

Unknown Objects of Iron. Many objects were found which could not be identified. One especially intriguing item was found in Well No. 1. It was at first thought to have been used as the bucket for raising water from the well. However, its size and the lack of strong fastenings for a bale discouraged this thought. It was a huge container (Plate XXI, B) made of about $\frac{3}{32}$ " thick sheet metal. It was badly rusted and either had come apart at its seam or had never been fastened together. Its reconstruction as given may not be too accurate. It measured about 27" high and 28" in diameter. A reinforcing hoop or band $\frac{1}{8}$ " x 4" had been riveted around the bottom with rivets every 3 inches. Half-inch holes every three inches were drilled next to the bottom. Six diamonds $7\frac{1}{2}$ " square had been cut out halfway up the sides. Rivets decorated the corners and halfway between the corners of these diamonds. Two projections on either side of the bucket were slightly higher than the top. If this object was intended for use as a bucket it would have had a wooden lining across the bottom and around the sides. The holes in the bottom could have been used for bolting wooden staves inside the container. The bottom may have been set in similar to the method of putting tops and bottoms in casks. No trace of wood was found with the container. It is estimated that about 40 gallons could have been lifted to the surface by using a strong windlass with this bucket. However, it has also been suggested that such an object could have been used around a large heating stove to keep anyone from getting too close and burning himself. This is a more logical explanation than the well bucket idea.

An iron object which may have been the handle to the stove was also found in the well. It was made of one quarter by inch and one quarter strap iron and was 28 inches in length but flat. Two large eyes were on either end which had been bent down. To this something had been riveted with at least $\frac{1}{4}$ " x 2" rivets. Possibly a heavy piece of oak could have been riveted on this which might have served as a reinforcing and as a spreader for the bucket. However, it would appear that this would have been rather weak for such a purpose.

In shape and size three iron objects of unknown use appear very much like golf irons. If only one had been found, its appearance would have been considered accidental, but three identical specimens must mean that whatever they were, they had a definite use which has not been determined.

Windlass. During the excavation of Well No. 1, a windlass, complete with iron ferrules and crank handles, was found across the top of the cribbed well shaft. The drum had been made of a fir log and was still in a good state of preservation. The windlass was found in place and would substantiate the theory that water was drawn from the lower

level, some twelve to fourteen feet below the ground level. The larger excavation above the well shaft (see Fig. 5) must have been used as a "spring house" or cooling room for perishables.

Objects of Brass, Copper and Other Metals

After iron came brass and copper in importance in the economy of Fort Vancouver. No doubt iron was used for many small objects which did not survive due to its propensity for rusting away. All of the finer articles appear to have been manufactured from brass or copper. Incidentally, without a test it is sometimes rather difficult to determine which has been found, except in the case of copper sheets, because both turn a drab greenish color.

Objects of metal other than iron were not found in great quantity, but many interesting items did turn up. The following list includes all identifiable objects found:

- Ammunition
- Balance or spring scale (American period)
- Bridle Bit
- Buckles
- Buttons
- Cabinet and Chest Hardware
- Candle Snuffers
- Coins
- Door locks and strikes
- Kettles
- Lamp and Lantern Parts
- Gun Parts
- Jewelry
- Musical Instruments
- Nails and Tacks
- Seals, lead
- Spectacles
- Spigots
- Spoons
- Thimbles
- Toothpick

Several interesting identifications have come from the studies made of objects found at Fort Vancouver. Because of the fact that many unidentified objects were found practically on the surface, the question always arose as to whether they might not be of American origin. During the first two years a few objects were shelved without further study because their age and provenience were not known and they were not associated with the fur trade. However, as further study has taken place it has been realized that more objects were used by the Hudson's Bay Company personnel than was at first thought. Authorities on the identification of certain classes of artifacts were contacted and what information was received was usually taken as correct.

Ammunition. Objects of this nature which might have been used at Fort Vancouver include shot, ball, gunpowder, percussion caps, cartridges, fuses, wads, grenades and artillery primers. Rifle flints probably should be included here but will be discussed in a later portion of the report.

Of those items, many of which were basic to the fur trade, only the durable ones were found during the excavations. Shot and ball were relatively plentiful, especially in the areas of the Shop and Stores, No. 4, and the Indian Trade Store, No. 21. The shot was all in two sizes, BB and three-sixteenths of an inch in diameter. The balls were 35, 50, 55 and 60 caliber in size.

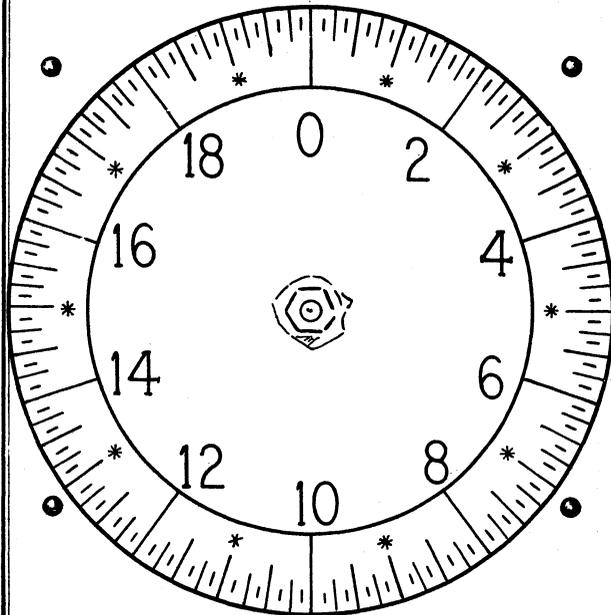
All cartridges, bullets, and other objects relating to this use were either on or near the surface. Some of them in fact were of very recent vintage. The following identifications were made:

- Brass cannon primers, U. S. Army
- Bullets (.58 caliber) minie balls used in muzzle-loaders, 1855-1873.
- Bullets (500 grain) and cartridges for the .45/70 U. S. Army rifle, 1882-1888.
- Cartridge cases for paper bullet blank for 1903 Springfield rifle, Frankfort Arsenal.
- Tin or nickel-plated cartridges for Krag rifle, 30/40, either for gallery or guard.
- Cartridge (.50 caliber) for Spencer carbine or rifle.
- Cartridge (.45 caliber) for Sharps rifle.
- Cartridge (.44 caliber) for Colt revolver.
- Cartridge (.30/220) for Krag rifle.
- Cartridge (.38 long) for Colt New Navy revolver, 1892.
- Cartridge (.30/40) for Krag rifle.
- Cartridge (.42 caliber) Berdan.
- Percussion caps (thick-walled), English manufacture by Elly Brothers, London.
- Percussion caps (thin-walled), American manufacture by the Union Metallic Cartridge Co., Bridgeport, Connecticut.

Balance or Spring Scale. The brass face of the balance or scale shown in Figure 12 was found in the trash of the American period. It was made in New York by Chatillon and called "Improved Circular Spring Balance." The spring and other portions of the back were all of iron and were badly rusted. The dial is marked off to weigh up to 20 pounds by 2 ounces. The hand or pointer was of iron and had disappeared. A pointer on the side came down the edge of the scale where marks designated 20, 40 and 60 pounds.

Bridle Bit. One part of a brass port bridle bit (Fig. 13) was the only example of such an item found.

• CHATILEON'S •
*IMPROVED CIRCULAR
SPRING BALANCE
TO WEIGH 60 lb.
BY 2 OUNCES.*



EACH 20 lb IS MARKED ON THE SIDE
THE INTERMEDIATE WEIGHTS ON THE CIRCLE

NEW YORK

FIGURE 12. SPRING BALANCE

Errata: The name CHATLEON was
mistaken for CHATILLON when taking
the lettering off the damaged spring
balance. CHATILLON is the name found
in hardware catalogs of the 1870s.

Buckles. Buckles of various kinds were found. Most of these were small, apparently used for cloth or light leather. They probably had been used on fancy shoes and clothing. One engraved brass belt buckle (Fig. 13) showed very fine workmanship. The central section, representing a floral pattern, was made separately and fastened to the base by use of a rivet in the center. On the back was a section of heavy brass wire soldered on for the purpose of fastening one end of the belt.

Buttons. Buttons (Fig. 14) were made of various materials, but since the greater number were of brass, they will all be described in this section. Buttons were made of tinned plate, sheet iron, wood, bone, glass, horn, semi-precious stones, porcelain, corozo nuts, brass and other mixtures of metal. 36/

Flat gilt metal buttons were the commonest type found and aside from bone and horn were the oldest in use, having been first made and worn in the early days of George III (1760-1820). They were used both for civilian and military purposes and for the trade. Seven different diameters were found as follows: One-half, seven-sixteenths, five-eighths, eleven-sixteenths, three-quarters, thirteen-sixteenths, and one inch. Several types are noted in the method of manufacture. The commonest variety consists of a flat disk of brass stamped from sheet to which a circle of copper wire or neck was soldered on the reverse side for fastening. Another variety was made from an alloy called plating metal, which contained a larger proportion of copper and less zinc than ordinary brass. Devices were sometimes produced on their obverse sides by stamping the previously cut-out blanks or metal discs into steel dies. Sometimes the grade of gilt or silver applied was stamped on the reverse side around the outer circumference. The grades noted were, "STANDARD ORANGE GILT," "STANDARD," "SUPERFINE," and "EXTRA PLATED SUPERIOR QUALITY" (silver). Another type was made of a hard white bell-metal, the necks of which were cast in; the obverse sides show unmistakable evidence of having been turned in a lathe to remove the traces of casting and reduce the thickness. On the latter type the surfaces were made bright by abrasion and finally polished. 37/ Gilding was done with gold by the amalgam process, the gold being mixed with mercury and applied as a paste. The buttons were then subjected to heat in a gilding muffle in which the mercury was dissipated in fumes while the gold attracted to the metal remained and was made bright by burnishing.

Ball buttons were also used in the trade and for fancier dress such as on vests and shirts. These hollow spherical buttons came in at least three sizes, five-sixteenths, three-eighths and one-half inch in diameter. They were made from two flat discs of metal, by a succession of tools worked in a press, the necks having previously been soldered to a

36/ Bevan, vol. 3, 76-86.

37/ Bevan, vol. 3, 77.

"collet" of metal which was set in and firmly secured to the disc by a pair of dies worked in a press. The two halves were soldered together and made smooth by abrasion. They appear to have been gilt and burnished to a high finish. Occasionally ornamental perforated ball buttons, mis-called "filagree," were made, having their ornamentation stamped on and pierced before the blanks were raised by the press into a spherical form and finished as before.

Buttons made of iron were produced from sheet iron in a similar manner to those in brass. Examples were also made of pewter, zinc and tin.

Two "Phoenix" buttons were found during the excavations. Both measured five-eighths inch in diameter. Both were in poor condition. The obverse of these buttons is slightly convex and carries a device consisting of the mythical Phoenix bird crowned and rising from flames. Around the circumference is a motto, "Je renais de mes cendres" and a regiment number.

The finding of the "Phoenix" buttons is rather wide-spread in the West. They are found in northern Sonora, Lower California, Arizona, California, Oregon and Washington and probably elsewhere. However, the highest concentration of both finds and numbers of this type of button centers in the Northwest along the Columbia River and its tributaries. They come in two sizes with various regiment numbers and appear to have been made for use in Haiti, the exact time having not as yet been determined.

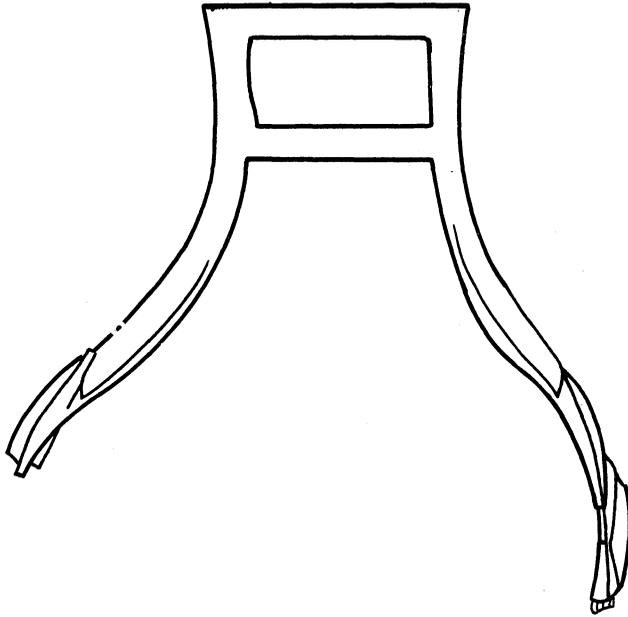
Nathaniel J. Wyeth, before his trading endeavors in the Northwest, took a ship-load of ice from Boston to Haiti. It could well be that he found out about the supply of "Phoenix" buttons there and realized their value as trade items in his project in the Northwest. Coincidentally, many of these buttons, along with some marked "A J TOWER & CO. BOSTON," have been found along the south shore of Sauvies Island near where Wyeth established Fort William.

Other buttons found during the excavations include examples made of carved jet with metal backings, bone and glass.

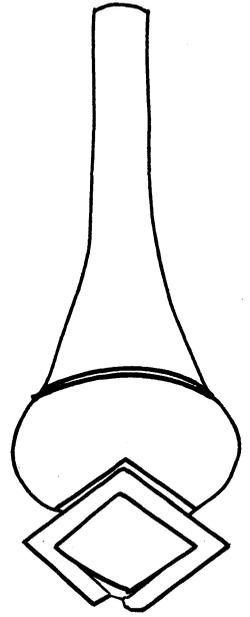
Army buttons were found mainly in the upper part of Well No. 1 and on or near the surface. One was found in the Indian Trade Store and another in Trash Pit No. 4. They vary in size from one-half inch to one and one-eighth inches in diameter. Markings on the reverse side were as follows:

Horstmann Bros. & Co. Phil.
J. H. WILSON, Phila.
Wm Lang, Boston, Mass
COVILLS & CO. EXTRA
Horstmann & Allen N Y (Indian Trade Store)

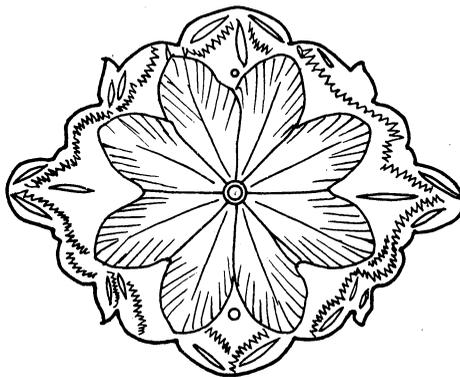
BRASS STIRRUP



FRONT VIEW



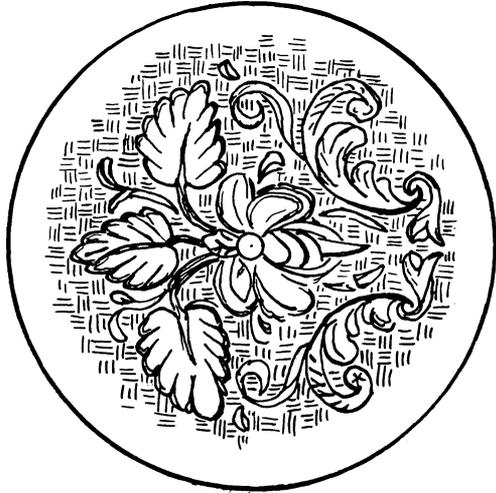
SIDE VIEW



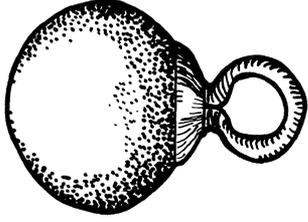
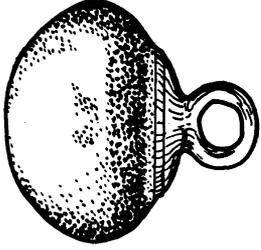
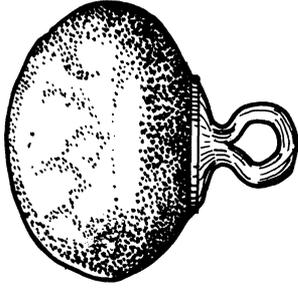
BRASS BELT BUCKLE



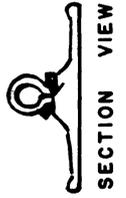
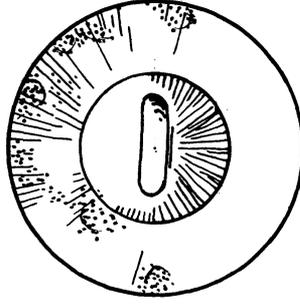
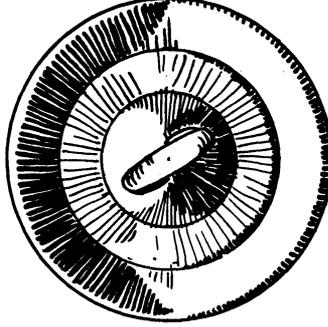
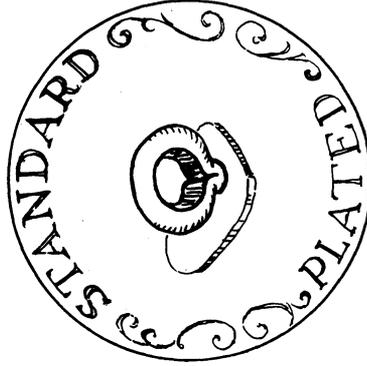
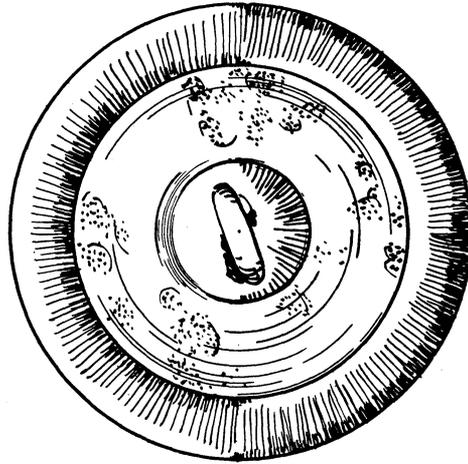
FIGURE 13



GOLD BUTTON



BALL BUTTONS



SECTION VIEW



PERSPECTIVE



SIDE VIEW

FIGURE 14
BUTTONS

Cabinet and Chest Hardware. Whole and broken brass hardware for cabinets and chests was found in various parts of the fort. Brass corners, angles, latches, locks, hinges, handle and keyhole escutcheons, all very well made, were proof of the number of cabinets and chests in use at that time. Brass tacks and diamond-shaped objects were used for ornamenting wooden chests. These chests were also further decorated either by covering with colored oilcloth or by painted designs. Such chests were favorite trade items with the Indians for use in storing their personal belongings or ceremonial dress and paraphernalia.

Candle Snuffers. The usual candle snuffers found were made of iron in two parts similar to scissors. However, a fine example of a cone-shaped snuffer of brass was also unearthed.

Coins. Before excavation and during the work remarks were made by visitors to the effect that they knew that any number of English coins had been found on the fort site. However, excavations failed to substantiate these claims. Only a few coins were found and these were not English. One Mexican peso, 1847, one American half dollar, 1891, and two American dimes, both 1839, were the only coins recovered during the work.

Door Locks and Strikes. Two excellent examples of brass door locks complete with works were recovered. Strikes for these locks were also found. These undoubtedly had been originally on the doors of the Chief Factor's House. Upon comparison with the brass locks on the McLoughlin House in Oregon City, they were found to be identical. The locks now in use on the McLoughlin House were originally on the nearby Barclay House.

Kettles. Kettle apparently were manufactured in England in various sizes and shapes. They were made of sheet iron, sheet brass, and sheet copper. The brass and copper kettles were listed in pounds and traded at around one pound for two beaver skins. No complete kettles were found during the excavations.

Lamp and Lantern Parts. All lamp and lantern parts found came from the American period of trash in Well No. 1. Candles were much in use during the Hudson's Bay period, but fish oils were used for lamps. The type of lamps used for burning fish oil is not known.

The lantern and lamp parts found were of brass, and some examples were marked "Dietz." A. G. Dietz & Co. was in business as early as 1850 in San Francisco as commission merchants. The firm was selling lanterns marked "Dietz" from 1852-1899 according to the San Francisco City Directories.

Gun Parts. The only brass gun part that was positively identified was a small portion of a brass side plate or screw plate cast in the shape of a dragon, found in the Indian Trade Store. This was a part from one of the famous North West guns made for the trade. 38/

38/ Gaywood, Archeological Excavations at Fort Spokane, 1951, 1952 and 1953, 53-56.

Jewelry. Under this heading are the various objects of brass used for personal adornment and in the trade. Finger rings, both plain brass bands and brass with colored glass settings, were fairly common. They are noted in the lists of trading items and must have been used in large quantities. They were possibly worn by the Indians as decorations on clothing as well as finger rings. The condition of these rings was often very fragile after their long sojourn underground. They often broke when being cleaned. Apparently soil conditions and alternate wet and dry hurried this oxidizing process which made them so brittle. Earrings are reported as trade items, but none was found.

Although no objects of silver or gold were found, some silver material was recovered. Strips of silver, one-eighth inch wide, flat on one side and rounded on the other, were probably meant to be used for the making of band rings. Thin sheeting of silver was found in several instances. Its possible use was not determined.

Musical Instruments. Although a very thorough search was made for fragments of large musical instruments, none was found. Jew's-harps (Fig. 15) were common. These are known to have been used all over America for trade. The few harmonica fragments found would probably indicate that this musical instrument was used only by the personnel of the fort. None is listed in any of the trade lists.

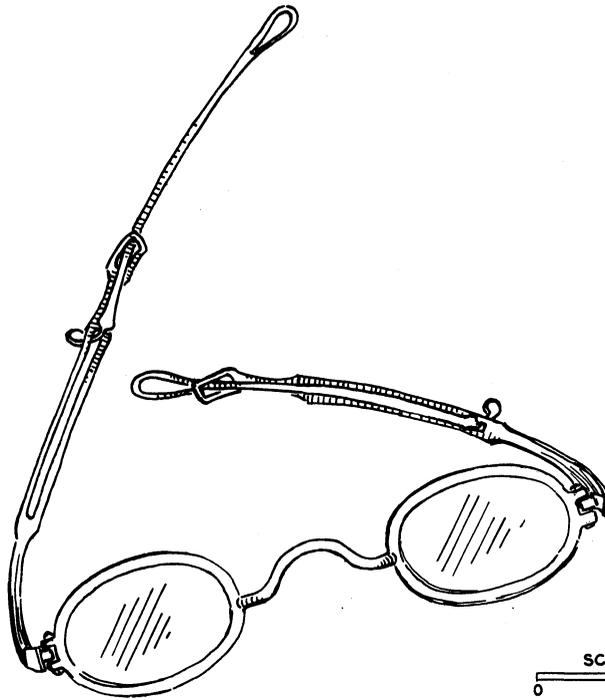
Nails and Tacks. Copper and brass nails and tacks were found in small quantities. All were well made and perfectly preserved.

Seals, lead. Two lead seals bearing the crest of the Hudson's Bay Company were found during the excavations. These were used for sealing bundles of furs when ready for shipment to market by sailing vessel. Surmounting the crest are the Latin words "PRO PELLE CUTEEM." On the reverse side of one seal are the numerals "44" roughly scratched into the soft metal. A similar lead seal was found at Whitman National Monument.

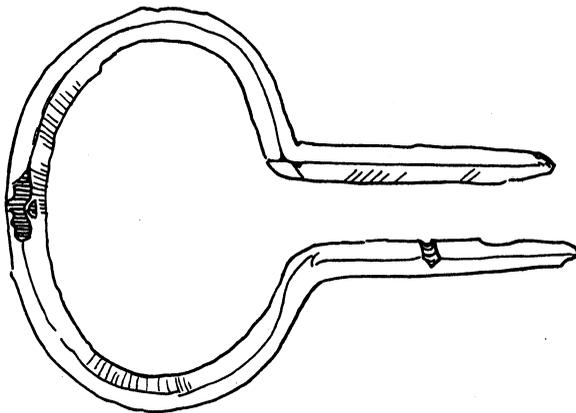
Another lead seal contains the letters "J B," in reverse, on one side. It was made for impressing these letters into some soft material, perhaps sealing wax. The letters were probably the initials of James Birnie, a Company employee in charge of Fort George from 1839 to 1846.

Spectacles. Spectacles are known to have been in use for a long period before that covered by this report. However, it is seldom that such objects are found in excavations. Fragments of a pair with adjustable iron frames were recovered in the burial of Jaco Finlay at Fort Spokane. 39/ A pair with adjustable brass frames (Fig. 15) was recovered in the Fort Vancouver excavations at the Indian Trade Store. Except for a minute fragment of glass the lenses were gone. A stock of spectacles with lenses of varying strengths was undoubtedly kept on hand for use of employecs and natives.

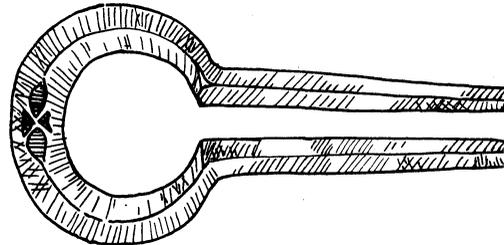
39/ Caywood, Archeological Excavations at Fort Spokane, 23.



A. SPECTACLES FRAMES - RESTORED



B. FROM AMERICAN PERIOD



C. HUDSONS BAY CO. PERIOD

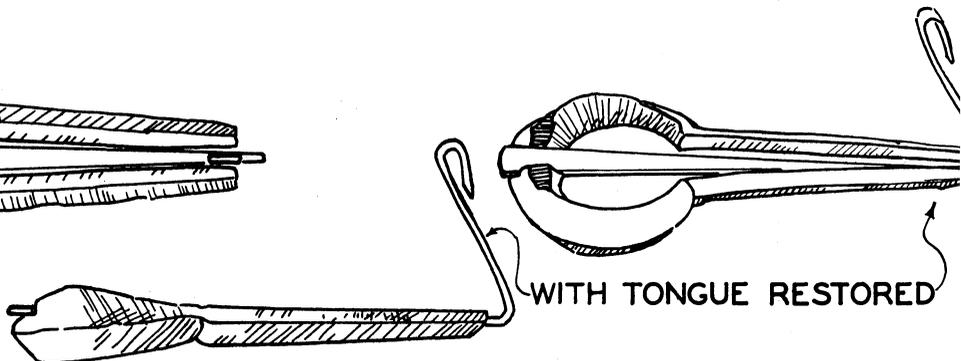
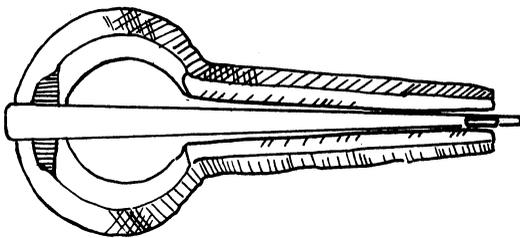
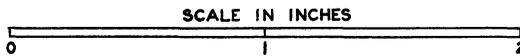


FIGURE 15

Spigots With and Without Detachable Handles. Three brass objects were found during the excavation of the bastion which appeared to have been used as keys. Each was shaped like a key but instead of a bit or web being fastened to the pin, it was hollow and each of the three was shaped differently inside. The keys were in reality detachable handles for the opening and closing of cocks of brass spigots placed in water or liquor casks. A cock from a spigot was found which had a diamond-shaped top. Upon trying a key with a diamond-shaped opening (Plate XIV), it was found that it fitted perfectly over the diamond-shaped projection. The other keys had triangular openings of different sizes but no other spigots were found to which they may have belonged. This type of handle or key was invented by Handasyd and Rudder in England and patented sometime prior to 1811. 40/

Regular spigots without detachable handles were well made of brass and after cleaning and oiling were in as good working condition as when discarded.

Stirrup. One broken brass stirrup (Fig. 13) was the only part of a saddle found.

Thimbles. A number of brass trade thimbles were found in the trade store. A silver thimble, marked "7," and with the initials "LRS" engraved along the band, came from the Priest's House.

Toothpicks. A silver toothpick approximately one and one-half inches in length was found. There had been a small handle on the pick, but of what material was not determined. Toothpicks of this style were carried by the gentlemen, sometimes on small chains.

Ceramics

Broken dishes and crockery vessels were found in every section of the historic area of Fort Vancouver, not only within the stockade but outside as well. Fragments were plentiful in the old village area, and a test trench across the old lagoon uncovered sherds as much as three feet below the present surface. Apparently at least two feet of this was fairly recent fill above the old lagoon bottom. Since the excavations in 1950 the lagoon area has been filled and leveled by the Army. Except for a very small percentage of Chinese and American specimens, all pottery fragments were of English origin. The manufacturers of these English wares, which were found not only at Fort Vancouver but at other Hudson's Bay Company forts in the Pacific Northwest, included such well known names as Adams, Adderly, Davenport, Mayer, Rockingham and Spode.

The gentlemen of the Hudson's Bay Company, although living in a new world far from home, still appreciated the finer products of the old country and obtained them whenever possible. Because of George Simpson's

40/ Abraham Rees, University Dictionary of Arts, Sciences and Literature, vol. III, plate XIV.

economy measures and reorganization of the Company's business many "luxury" items were no longer ordered. Instead, food items such as wheat, corn, pease and beans, all formerly imported, were raised at the forts or supplied through the Puget's Sound Agricultural Company's farms. Many manufactured items, instead of being imported from England, were either made at the forts from the raw materials at hand or were obtained from sources in America. Such a policy encouraged the establishment of small factories in Canada or the purchase of goods from the infant industries of the United States. However, many durable items could not be obtained in quantity or of the desired quality in the New World and were continued on the requisitions for the annual outfits. Earthenware, Chinese porcelain, and common glazed crockery wares (except for Bennington ware from Vermont) continued to be imported from regular sources of supply. Apparently the need for such items did not come under the castigation of George Simpson.

Some of the most interesting work during the excavations was finding the caches of broken earthenware. Along the north wall behind the two kitchen locations quantities of earthenware fragments were found which had been thrown into the trenches where the stockade posts had been buried. These pieces were disposed of as part of the trash used in refilling the trenches after replacing sections of the rotted wall. They were associated with the middle wall of the three found here and probably belonged to time of the replacement of the wall reported by James Douglas in 1838. Broken earthenware was found in trash pits, pit toilets and wells. Large quantities came from trash pits numbered 4, 7, 10 and 13. In these pits it appeared that either broken lots of new dishes had been thrown away or new dishes had been purposely discarded. No whole pieces were found, but most fragments of individual vessels were in place. One possibility is that when the time came to move to Victoria in 1860 it was found that all of the goods could not be transported in the small vessel, the Otter. Dishes, being heavy and of less value than other needed items, might have been relegated to trash pits rather than letting them fall into the hands of the U. S. Army. Many of these dishes might not have been broken at the time of burial, but were reduced to fragments during World War II when heavy Army vehicles such as tanks were parked in the area. They could have easily crushed objects of pottery and glass while being moved over the soft trash pits.

When these huge lots of broken earthenware were washed and sorted, more than sixty different pottery patterns were noted. Many of these were marked on the back, most of them being identified as Spode manufactured by Copeland and Garrett between the years 1833 to 1847, or by W. T. Copeland from 1847 to 1867.

Such quantities of English earthenware were found at Fort Vancouver that a special study was made to determine as much as possible about English potteries. Eighty-nine specimens selected from the more than twenty thousand found were shipped to Copeland & Thompson, Inc., of New York, representing the English firm of W. T. Copeland & Sons, Ltd., for identification. Most of the identifications were made by Mr. Sidney E

Thompson. Those which could not be identified by him were then sent to the Spode factory in England where Mr. Gresham Copeland identified as many of the remainder as possible. The results of these identifications are:

1. "Acorn" printed in neutral or gray underglaze.
2. "Aesops Fables" printed in blue underglaze.
3. "Alhambra" printed in blue underglaze.
4. "Aster" printed in mauve underglaze.
5. "B 700" printed in blue underglaze.
6. "B 772" printed in blue underglaze.
7. "Bamboo" printed in blue underglaze.
8. "Beverly" printed in blue underglaze.
9. "Bird and Table" or "Pekin" or "Royal Hotel" or "Macaw,"
as it is known today, printed in blue underglaze.
10. "Blue Italian" printed in blue underglaze.
11. "Blue Willow" printed in blue underglaze.
12. "Bouquet" or "British Flowers" printed in blue underglaze.
13. "Broseley" printed in blue underglaze.
14. "Broth" printed in puce underglaze.
15. "Byron" printed in blue underglaze.
16. "Byron Scenes" printed in blue underglaze.
17. "Cairo" printed in blue underglaze.
18. "Camilla" printed in green, blue and pink underglaze.
19. "Chatsworth" printed in blue, Saxon blue, pink, green
and brown underglaze.
20. "Chinese" printed in blue underglaze.
21. "Continental" printed in blue underglaze.
22. "Crackle" printed in blue underglaze.
23. "Fairy Tales" printed in blue underglaze.
24. "Filigree" printed in blue underglaze.
25. "Italian" printed in blue underglaze.
26. "Italian Seaport" printed in blue underglaze.
27. "Hop" printed in neutral or gray underglaze.
28. "Geranium" printed in light blue underglaze.
29. "Girl at Well" printed in blue underglaze.
30. "May" printed in blue underglaze.
31. "Lace" printed in blue underglaze.
32. "Mayflower" printed in blue underglaze.
33. "Morocco" printed in gray underglaze.
34. "Parrot" printed in blue underglaze.
35. "Portland Vase" printed in blue underglaze.
36. "Queen Mary" printed in blue underglaze.
37. "Rose of Springs" printed in mauve underglaze.
38. "Seasons" printed in gray and green underglaze.
39. "Sevres Sprigs" printed in blue underglaze.
40. "Star" printed in blue underglaze.
41. "Swiss Cottage" in blue underglaze.
42. "Tower" printed in light blue underglaze.
43. "Warwick" printed in pink underglaze.

In addition to this list of identified Spode patterns there are other specimens which were undoubtedly of Spode manufacture but not identifiable as to pattern. Since so much of this company's product was found here and at other posts, it might be well to briefly review the history of the manufacture of Spode. According to Mr. Gresham Copeland of W. T. Copeland & Sons, Ltd., there are no records of there having been contracts between that company and the Hudson's Bay Company to supply earthenware. In the year 1828, according to the latter's archives, Mr. Robert Elliott supplied earthenware, china and glassware, probably as a broker for such products. Copeland and Garrett were supplying earthenware, according to the same source, in the year 1846 and apparently had been since 1836. 41/

In 1749 Josiah Spode I apprenticed himself, at the age of 16, to Thomas Whieldon, one of the most ingenious potters of his day. The pottery industry was then developing in the little midland county of Staffordshire because of local deposits of good clay suitable for the manufacture of earthenware. In 1770, Josiah Spode I acquired part of the property of a location in the center of Stoke called "Twelve Acres," which has continued and expanded ever since to become the present world-known factory of W. T. Copeland & Sons, Ltd.

Two major developments in the pottery industry were made by Josiah Spode I during his lifetime. It was he who perfected the process of underglaze printing and introduced underglaze blue to Staffordshire, but his major triumph was the perfection of the formula for Bone China which is still standard today. After years of experiment and failure, in 1794 Spode drew from his oven the first piece of English Bone China, pure white and sparkling in its translucent beauty - a new ware that rivaled the finest brought from the Orient. 42/ Apparently none of this more expensive Bone China ever reached Fort Vancouver - at least no examples were recovered. It is doubtful that it was purchased by the company because of its greater cost.

A far-reaching business transaction that Josiah Spode I entered into was the opening of a London salesroom in charge of William Copeland, a London banker and tea merchant. So successful was this venture that Spode sent his son, Josiah Spode II, to learn the selling end of the business.

Copeland's contact with the Orient brought him innumerable Chinese designs on the elaborately decorated papers in which tea was wrapped. Many of these designs were adopted by Spode and have been bequeathed to posterity as dinnerware decorations. Such Spode patterns as "Aster" or "Chinese Plants," "Macaw" or "Pekin," "Broseley," "Chinese," and "Blue Willow," all of which were found at Fort Vancouver, clearly show the Chinese influence. During the excavations for the foundations of new

41/ Information supplied by R. A. Reynolds, Secretary, Hudson's Bay Company.
42/ Copeland and Thompson, Inc., Spode, the Fine English Dinnerware, 4.

buildings for the factory in Stoke-on-Trent many pieces of the early blue underglaze Spode and some few of Chinese porcelain were found. The finding of the latter would indicate that these specimens of Oriental workmanship were also used as a basis for working out some of the early patterns. The company now maintains a museum in which are treasured the early copper engravings used for Spode's blue underglaze printed productions.

The work of cleaning, cataloging and restoring the printed underglaze earthenware vessels resulted in the determination of many of the shapes. These included two sizes of dinner plates, soup plates, large cups and saucers, serving dishes for vegetables, meats and fish, pitchers, ewers, wash basins and chambers.

Since so very few examples of other English earthenwares were found, no attempt was made to go further into the history of the companies producing them. They were identified, as far as possible, by Messrs. Thompson and Copeland and include the following:

1. Rockingham's orange and copper lustre ware.
2. Mayer's "Oregon" with pattern in flow blue underglaze.
3. Adderly's "Chelsea" with mauve floral motif made in separate mold and applied.
4. Adam's glaze blue and yellow.
5. Woods' with blue and green underglaze edgings.
6. Davenport's "Tyrolean Hunters" printed in blue underglaze.
7. Claremont Stone China.
8. "Eton College" printed in blue underglaze, maker unknown.

In addition to the above identified wares there were others which were unidentifiable. A very common ware found in trash pits away from the vicinity of the Chief Factor's residence and the kitchen area was plain without markings of any kind except occasionally an asterisk imprinted in the paste on the reverse side before firing. This ware was creamy white in color and well made. Apparently it was used by others who resided within the stockade but who did not eat in the Chief Factor's residence. Shapes included plates, soup plates, serving dishes, ewers and chambers.

The well known Willow pattern in blue underglaze was found in large quantities in the trash pits. The shapes included small dinner plates, regular size dinner plates, soup plates, large platters and large covered tureens. Incidentally, one platter had been broken and mended by its original owner by drilling holes along the cracks and binding with some perishable material which had since rotted away. The platter was crackled and blackened from long use. The glaze was dulled from wear.

A few of the Willow pattern vessels had small impressed marks on the reverse sides, but none identified the manufacturer or the time of manufacture. Almost all of them had 32 apples in the pattern, but one platter had 55 and another 58. According to Sidney B. Williams, the Willow pattern was first made by Thomas Turner at the Caughley Pottery works in

Stropshire, from an old Chinese design or designs. 43/ Probably no other pattern has been so widely copied by potters all over the world. Thomas Minton, an apprentice engraver at Caughley, worked out the first copper-plates cut for the printing of the Willow pattern. Before leaving to found his own pottery works about 1785, he designed slight variations of the original pattern which he sold to Spode, Wedgwood, Adams, Davenport and others. Spode began to produce Willow ware in 1785 and applied it to earthenware only. On the Spode printed pattern the apple tree bears 32 apples.

A mass of broken blue underglaze bowls marked "Semi-China" was taken from Trash Pit No. 3. The broken remains of twenty-four individual earthenware bowls, both shallow and deep, of the same pattern came from this pit. Many of these were entirely restored. Other examples of this ware were found at other places around the fort but only in small fragments. This ware is associated with the plain white and the Willow pattern mentioned above, but has not been identified as to manufacturer.

Two large pieces of a green underglaze saucer were also found in Trash Pit No. 3. A few fragments of another similar saucer were also found in this same pit. A marking in French appeared on the reverse sides of these saucers which reads, "Teniers' Vignettes, H. M. I." An almost complete cup of the same ware was also found which had been mended by the original users. The cup had been repaired by wrapping wire around the bottom or rest and by the insertion of connecting lead plugs on either side of other broken places. The maker of this ware is unknown.

What may represent an historic memento of the famous round-the-world United States Exploring Expedition of 1838-1842 was a broken chamber from Trash Pit No. 4. This ceramic gem had the United States Navy coat of arms with the wording, "Come Box the Compass" and "May Success Attend Our Agriculture, Trade and Manufactures." Could this item which may have traveled almost around the world have belonged to Lieut. George Foster Emmons, U. S. Navy, who, after the wreck of the sloop-of-war Peacock at the mouth of the Columbia River in 1841, stayed at Fort Vancouver as the guest of Dr. John McLoughlin? Fortunately, or unfortunately, some Indian maiden may have carelessly dropped this chamber and left for posterity the fact that Lieutenant Emmons had slept at Fort Vancouver.

The finding of some Chinese porcelain and other wares of probable Chinese manufacture follows in line with the excavations at Fort Spokane, Fort Okanogan and Fort Walla Walla. Ceramics of Chinese manufacture are fairly well documented. Commercial relations between the Philippines and New Spain were well established before 1600. Trading galleons were making regular runs between Luzon and the west coast of Mexico carrying among other things quantities of Chinese porcelains and crockery storage jars filled with products of the Far East. Evidence of this intercourse is

43/ Sidney B. Williams, Antique Blue and White Spode, 155-56.

found wherever Spain's colonial system left its mark. In the ruins of the missions and presidios from Florida to California such evidence is common. Even Drake as he coasted northward in 1579 took as prizes a number of Spanish ships and transferred to his own vessels crates of Chinese porcelains, fragments of which apparently have been found around Drakes Bay in northern California. Germeño, coming sixteen years later from Manila bound for Acapulco, unfortunately was shipwrecked in this same bay and left additional Chinese ceramics which were widely distributed by the local Indians to their numerous villages.

In later years, after the decline of Spanish world supremacy, we find that Chinese products continued to find their way to the west coast of the New World in English and American vessels. Exactly how porcelains and crockery found their way to the Hudson's Bay Company posts is not known but the evidence was uncovered during the excavations, not in large quantities as compared to the English wares but in sufficient amounts for the purpose of study. Fragments were found to determine that the shapes included bowls, plates, cups and ginger jars in the white porcelain decorated with blue and black line designs. From the fragments of four broken dinner plates one was partially restored (Plate XVII). One half of a cup of extremely fine porcelain with Chinese markings in blue circles is also shown in Plate XVII. All fragments of a large ginger jar and half of the top were found.

An interesting collection of 54 pieces of Chinese porcelain decorated with the willow pattern is on display in the Oregon Historical Society museum in Portland. These were given to the museum in 1911 by Miss Amelia Peabody of Boston, a great-great-granddaughter of Captain Robert Gray. The set was purchased in Canton in 1793 and carried to Boston on his return voyage. The dinner plates are 9 inches in diameter and in some respects are similar to those found at Fort Vancouver, but the hand decoration is of a much better quality. The Fort Vancouver specimens do not have all of the requisites of the true willow pattern, and other elements appear to have been added. Chinese porcelain vessels found in the Fort Spokane excavations which would fall in the period of 1811 to 1825 have a much more delicate and finer decoration than the examples found at Fort Vancouver. Apparently when the demand for these porcelain vessels became greater in the 1840's and 1850's the quality of workmanship became poorer.

Fragments of large thick-walled green-glazed storage jars with flat bottoms and large orifices were recovered. Also, small thin-walled storage jars with dark brown - almost black - glaze were found. One of these had an oriental marking, presumably Chinese, on the bottom. Because of the thin, friable walls the vessels were broken into many small pieces in Trash Pit No. 6. However, two bottoms were fairly complete. One measured $5\frac{1}{4}$ inches in diameter and the other $4\frac{1}{2}$ inches. The tops were finished with orifices almost as large as the diameter which could have been stoppered in the conventional method with a wooden plug sealed with clay.

Brick and Tile. A considerable number of brick and tile, mostly broken pieces, were found during the excavations. The greatest quantities were in the fill of the later stockade walls, Well No. 1 and the Root House.

The bricks were of two kinds. The most numerous type were covered with a yellow slip. The color of the paste varied according to the degree of firing, from a yellow in the poorly fired ones running through various shades of muddy red to almost a black. The size of these bricks varied, but averaged about two and one-half inches by four inches by nine inches. One surface of one side of each brick was a depression measuring about two and one-half inches by five inches. In one end of this depression was a small circular 'dimple' measuring about three-quarters of an inch in diameter. Sometimes this depression also occurred in the opposite end. A few of the bricks of this type had the letter "W" impressed in the center of the depression. It is believed that this type of brick was imported from England. The other bricks were of a smaller size and usually cherry red in color. They were undoubtedly manufactured locally. They measured two inches in thickness and about three and three-quarters inches in width. No whole examples were found, so the length was not ascertained.

Four kinds of red tile were found and their measurements are as follows:

	<u>Width</u>	<u>Length</u>	<u>Thickness</u>
1. Thin flat roofing tile	6 1/2"	10 3/4"	1/2"
2. Square tile	12"	12"	2 1/4"
3. Rectangular tile	4 3/4"	9"	1 3/4"
4. Rectangular tile	7 1/2"	(?)	1 1/2"

The thin red flat roofing tiles were of good quality, although a few examples were badly warped from overfiring. No whole examples were found. Two holes had been punched in one end of each with a small pointed stock while the clay was still soft. The holes are $1\frac{1}{2}$ inches from the end and from $2\frac{1}{4}$ to 3 inches apart.

The large square tiles are very well made, with smooth, polished surfaces. There were no whole examples and those which were found all seem to have been used for the floor of the pit toilet in the northeast corner of the stockade. A large capital "P" appears in the center of each.

The rectangular tiles were rough and irregular in appearance. Very few of these were found, and their use is not known.

Clay Tobacco Pipes

Clay tobacco pipes appeared to have been much in demand if the quantity of broken parts found is any criterion of use. Being extremely fragile, they were undoubtedly subject to breakage more than any other object in daily use around the fort. More than 5,000 fragments of pipes, mostly stem fragments, were recovered during the excavations. Most of the stem fragments were white in color, and unmarked. This common, inexpensive, pipe of that period cost only about 2¢ each at the Company store and was readily replaced if broken.

Except for a few briar pipes with hard rubber stems from the American period of Well No. 1, the only other kinds of pipes found at Fort Vancouver were also of clay but of a different color, either plain or glazed in finish. These pipes, made of a reddish clay, are of American manufacture. They were made along the east coast from Maine to Virginia by a number of potters 44/ and marketed in the Far West, some few falling into the hands of the fur traders. All were cast in molds in several distinct types and sizes. One type is covered with little nubs to make it look like a corncob pipe. Fragments of a number of these "knobby" pipes finished in a high brown glaze were found. On one side of the stem of one of these was the mark "LEWIS," and on the other side "CASS." Another type was the effigy pipe, of which a number of examples were found. Two of these were molded in what appears to be the likeness of Nero, one of which was almost complete and had been fired to a pleasing terra cotta color without glaze. Another example of an effigy pipe depicts a moustached gentleman with a hat. Whom he might represent has not been determined.

These redware pipes were made for the insertion of a reed or wooden stem. Reeds usually came from the Dismal Swamp of southeastern Virginia. Wooden stems were osiers 45/ or pliable twigs of a variety of willow or dogwood.

Markings on the white clay pipes were usually those of the manufacturer and appeared on the bowls and heels. Some few examples, from the fragments, seem to have had no markings. Only one personal marking was found which consisted of the letters "A B K" scratched on the stem. Among the lists of the personnel of the Hudson's Bay Company no one can be found with these initials. After firing, a very few of the stems appear to have been dipped in a dull red coloring at the mouthpiece.

The pipes and markings are illustrated in Figure 16. Decorations appear to be mainly floral in character, either along the sides of the stem in the shape of vines or up the front and back of the pipe bowl in sprays of leaves. In some few instances flutings appear around the

44/ Watkins, 134-5.

45/ Watkins, 93.

bowl. Almost all clay pipes found have heels or spurs at the bottom of the bowl. The heel often had a letter on either side which was a part of the mold in the pipe machine. Markings on each side of the heel are shown in Figure 16. Examples without heels or spurs are illustrated. One has two fins moulded as part of the front and back of the bowl.

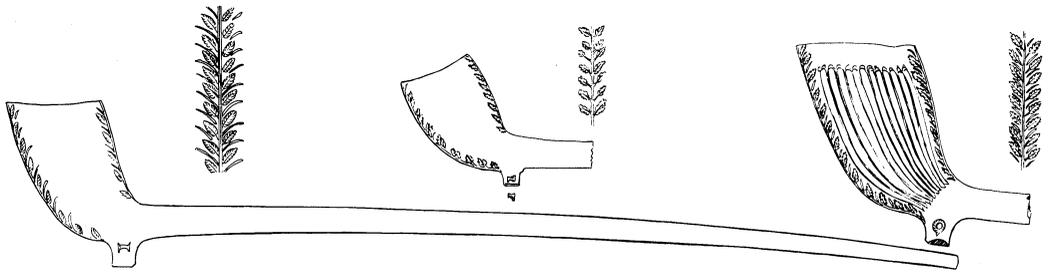
The name of the manufacturer always appears to have been applied with a flat stamp impressed by hand on the wet clay. Many irregularities appear in the stamping where parts of the names do not appear or where the stamper tried to repeat the impression which was not clear. The greatest number of the markings are those of J. and T. Ford of the borough of Stepney in London. According to the Hudson's Bay Company records, they were supplying clay pipes in 1846. In 1828 pipes were furnished by Thomas Duggan. Whether or not Duggan was the manufacturer or distributor is not known. No pipes have been found with that name stamped on them. The Ford-Stepney markings appear in a number of different types; with single line, double line, dashed line outlines and without an outline. The central decoration between the words, "Ford" and "Stepney" also differs, but the significance of the various marks is not known. One example shows "Ford" with another word which might have been "Radcliff." Two examples were found marked "Prince Albert" on the back side of the bowl. Pipes marked "T. D.," "Crème Gambier," "McDougall" and "Stuart" all appear to be of the American period just before 1860 and probably later. They were found in the trash of the Root Store, Well No. 1 and Trash Pit No. 19.

Tobacco was one of the most important items in the fur trade economy. From the accounts of some of the trappers and traders it appears to have become one of the few luxuries in the lives of the Indians as well as the whites. Tobacco, as we know, is a native American plant with more than forty species, which was introduced into the Old World by both the Spanish and English in the first quarter of the sixteenth century, and its use by smoking soon became fashionable. On the American continents its use by the natives had been known for centuries. It was customary when whites and natives met, and before talks began, for all present to smoke a pipeful of tobacco. The practice of giving a pipe and a small supply of tobacco to the leader of a native group was common during the fur trade period.

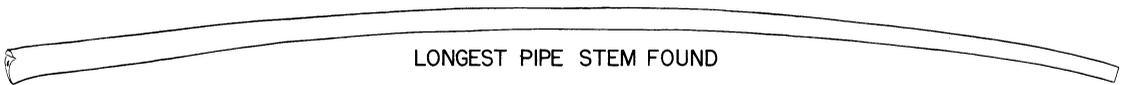
The Hudson's Bay Company purchased its tobacco supplies from Robert Laing, Robert Currey and John Mackenzie, all of London, according to the records for the year 1828. In 1846 the supplier was J. Wilson & Co. of New York.

Beginning in Colonial times, pipes made of clay in England, Scotland, France, Holland, Italy and Germany were imported into the Americas in large quantities. Pipe clay is a pure variety of potter's clay, the best of which was found at Poole in Dorsetshire, in Devonshire, and on the isle of Purbeck. Clay pipes were produced from this fine quality of white clay called kaolin. The clay was refined, after mining; by the removal of extraneous materials and by grinding. It was formed into cubical masses and then cut into sufficient sizes for pipe-making.

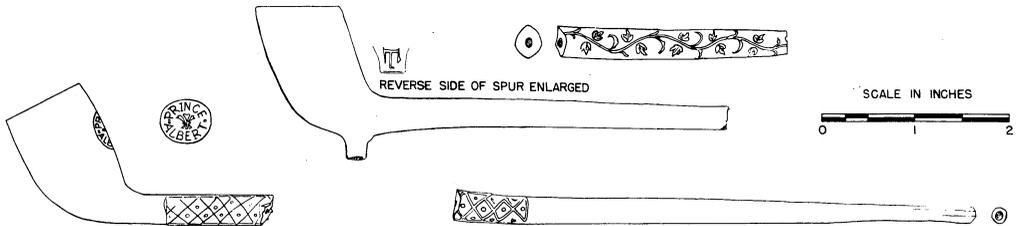
FIGURE 16. CLAY PIPES



PIPES WITH FLORAL DECORATIONS

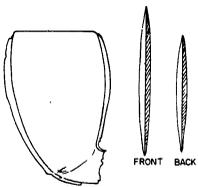


LONGEST PIPE STEM FOUND



REVERSE SIDE OF SPUR ENLARGED

SCALE IN INCHES



FRONT BACK

UNIDENTIFIED PIPE WITH FINS ON FRONT AND BACK



REVERSE SIDE

DASHED LINE OUTLINE



NO OUTLINE

ANOTHER EXAMPLE



TRASH PITS 11 B

J. B. T. FORD MARKS



DOUBLE LINE



SINGLE LINE



FORD "CLIFF"



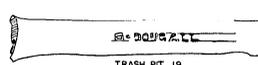
BISHOP HACKNEY JS



FROM ROOT STORE



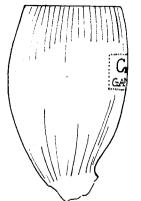
REVERSE SIDE



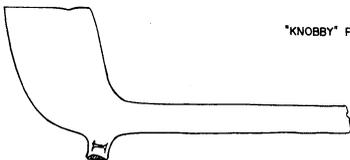
TRASH PIT 19



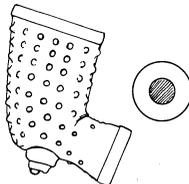
REVERSE SIDE



Crème GAMBIER



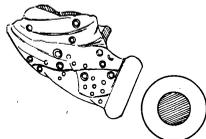
"KNOBBY" PIPE



EFFIGY PIPE



G.K.P.



Each piece was kneaded and rolled roughly into the size and form of the pipe and put into bunches of twelve. Iron needles or wires were inserted into the part of each which was to become the stem. The clay was then pressed into a half iron mold, the other half of the mold was then laid on the clay, and the whole passed through a press in which the clay received its form, including any device, inscription, or ornament which may have been engraved on the mold. The bowl was hollowed by introducing a "stopper" which squeezes out the clay, leaving the bowl hollow. The rough upper part of the bowl was cut off clean while in the mold, the needle withdrawn, and the pipe removed from the press and mold. The pipes were then trimmed and dried, after which they were placed in "saggers." The saggers were then placed in the kiln, heated gradually for several hours, and finally with a full heat were fired to the temperature necessary to fuse the clay into the desired hardness. Of all the thousands of pipe fragments found at Fort Vancouver, only one restoration was possible (Fig. 16). One complete stem was found which measured eleven and three quarters inches in length.

A number of articles have been written on clay pipes and the use of tobacco in England. The early beginnings of the use of tobacco, and the person who first introduced it, have not been determined. By 1575, however, pipe-makers were working at Brosley. Early pipes are fairly uniform in shape and size, varying only in the angle of the bowl with the stem. The bowl increased over the years from a diminutive size to its present dimensions, largely because of the scarcity and price of tobacco and the duty during the early period. By 1619 the craft of tobacco-pipe makers was incorporated, by James I, and their privileges were confirmed both by Charles I and Charles II. ^{46/} By that time the manufacture of pipes had become a regular trade, and many of the pipes have the maker's mark stamped on them, usually on the flattened heel. Later, when the heel was replaced by a spur, the bowl was sometimes marked.

To my knowledge, pipes similar to those found at Fort Vancouver have not been previously described or illustrated. In Plate 29 of the 1947 report a few examples are shown but not described in the text. The documentation of these pipes as illustrated in Figure 16 makes available for the first time a series of pipes belonging to the period from 1829 to 1860. Some few from Trash Pits 11 and 19, the Root House, and Well No. 1 probably belong to a later period not as yet fully determined. Previous research on pipes, their makers, and places of manufacture, has been concentrated on the earlier varieties.

Although the fur traders enjoyed few of the luxuries and niceties of life, there was one item which they were seldom without - their fragile clay pipes.

^{46/} Deane, 4.

Glass

Glass manufactures were very plentiful in all parts of the fort. A list would include the following general kinds:

- Beads
- Bottles of all kinds
- Glasses for table use
- Magnifying glasses
- Mirrors
- Spectacle Lenses
- Tubing
- Thermometer Tubes
- Window glass
- Watch crystals

No attempt will be made to describe the beads in detail. Color reproductions in full size would be the only method of properly treating them. They will be described by size, color and shape.

The smallest beads measured from 1 mm. to 3 mm. in diameter. These occur in white, green, garnet, red, pink, and light and dark blue.

The next size range from about 4 mm. to 5 mm. in average diameter (a few are as small as 2 mm.) and are creamy white, often with a slightly different shade of exterior, apparently a glaze over a long tube of glass before the beads were cut into size and shape. The same bead also occurs in a larger size averaging 1 cm. in diameter. The length of these beads, both large and small, is usually shorter than the diameter, but a very few are found in the opposite extreme of being much longer than the diameter.

About the same size as the last is an opaque blue type usually uniform in size and shape and measuring from 3 mm. to almost 5 mm. These occurred mainly in the area of the two west store buildings. These beads were apparently not cut from tubes but were made of individual globs of hot glass. Often a point of glass is found on one end near the hole.

Cylindrical beads of fairly large size were not numerous. Four complete beads made of an opaque yellow tubing came from the Indian Trade Store. They average 25 mm. in length and about 7 mm. in diameter. Other opaque tubular beads range from 5 mm. to 10 mm. in length and 5 mm. to 7 mm. in diameter. They occur in opaque blues of two shades, in brown and creamy white, with cores of almost the same colors.

Faceted beads come in black (small), brown, milk white, aquamarine, light and dark blue, brown and green. The smallest are 5 mm. by 5 mm., while the largest measure 10 mm. by 10 mm. The holes are usually uniform in size but the aquamarine and light blue are also found with the holes measuring 3 mm. on one end and 1 mm. on the other.

Spherical beads range in size from a clear green and blue type measuring 5 mm. in diameter to the largest, which is dark blue, from 12 mm. to 14 mm. in diameter. Other colors are red - both clear and with the white underlay - and a dark green with a floral decoration painted around the outside circumference.

Long oval-shaped beads occur in opaque white, red and blue. They range in size from about 8 mm. to 20 mm. in length. The large size is white and has red, white and green painted decoration in a spiral band going from one end to the other.

Glass beads were a most important trade item at this time. From contemporary accounts the warehouses in London must have been bulging with casks of beads. At that time they were manufactured both in northern Italy and in China. Many references are made to Canton beads. So far in the study of beads it has not been possible to determine exactly which beads came from Europe and which came from China.

Glass bottles of all sizes, kinds and colors were found. They fall fairly well into classes of use for spiritous liquors, perfumes, medicines, oil and ink.

From the number of bottles found, the gentlemen appear to have been well supplied with brandy, rum, Madiera and Port wine. Rum was the most common form of liquor if the bottle count is a true measure of what was used. Hundreds of dark green round rum bottles were found in various sizes, no two the same because of their being hand blown. Square brandy bottles of the same dark green glass were found. Wine came in thin bottles of slightly lighter green color. Several were found with seals blown into the glass. One example was marked on the shoulder with a bunch of grapes and "CHATEAU MARGAUX."

Marks on other bottles include the following:

LYRE & CO., BRISTOL

I. F. HOFFMAN & SONS, ROTTERDAM

H. ROCKETT, ROTTERDAM

OLDRIDGE'S BALM OF COLUMBIA FOR RESTORING HAIR, 1826

HOYT'S GERMAN COLOGNE, E. W. HOYT & CO., LOWELL, MASS.

SPERM SEWING OIL

PERINE GUYOT & CIE.

LUNDBORG PARFUMEUR

W. K. LEWIS & CO., BOSTON

ROBT. WRISINGTON . . . LONDON, BY THE KINGS ROYAL PATENT,
Jan. 26, 1754

MAUGENET & COUDRAY A PARIS

ESSENCE OF PEPPERMINT

Some of the bottles, especially those for medicines and perfumes, appear to have been blown into molds. Others were hand blown. All were of very thin, clear glass. Many had been fitted with ground glass stoppers, which were quite plentiful.

Glassware for the table included a number of shapes of water glasses and long stemmed wine glasses. One wine decanter with a finely cut stopper was found in Trash Pit No. 6. All glassware appeared to be of the best crystal quality. A few fragments of cut and pressed glass (Plate XX) were found but not enough of any one vessel for complete restoration.

Fragments of mirrors were occasionally found. These were used in the trade as well as at the various forts. One circular metal mirror back was found. Parts of spectacle lenses and one complete magnifying glass as well as parts of what could have been watch crystals were uncovered. Several fragments of thermometer tubes came from areas and pits which made them unquestionably of the Hudson's Bay Company period.

The thin window glass was located everywhere. A few large fragments still had putty on the edges. The Hudson's Bay Company probably furnished this item for all parts of the Northwest for years, even into the American period when the Army and the settlers purchased it for their use.

The bottles from the American period of Well No. 1 were quite different from those of the Hudson's Bay Company period. There were many more shapes (Plate XII) but none similar to the famous Hudson's Bay Company rum bottle. Markings for this later period included the following:

ISAAC LEISY & CO.
CLEVELAND, O.
BURNETT BOSTON
SIMMOND'S NABOB
C B B
DE POSSEL FILS
LEA & PERRINS
DE FORRESTS BELL TOP
(Ink bottle)
HERO GLASS WORKS
PHILADA PA

Four complete and two broken ink bottles were found in the American trash of Well No. 1.

Objects of Stone

One complete and two broken sharpening or scythe stones were found. The complete one measures 9 inches in length by 1 1/4 inches in width at its widest point in the center. The broken stones were larger and, if complete, would have measured about 16 inches in length by 2 inches in width. From the quantity of scythes and sickles found there should have been quite a number of sharpening stones. Several irregular flat stones with one flat worked surface looked as though they had been used for the sharpening of other edged tools.

Knapped gunflints of English manufacture were fairly common in the excavations. All those found here were black or dark gray in color and undoubtedly came from Brandon, England.

Slate pencils and fragments of writing slates were common, especially in the area of the Owyhee Church which had been used as a school. The slate pencils were short, measuring from one to two inches in length. They were irregularly shaped with from four to six sides and averaging about 3/16 of an inch in diameter. Slate pencils from the American period of Well No. 1 were larger in diameter and usually round. Some fragments of writing slates were found which had geometric designs around the borders. A number of fragments of writing slates were picked up in various parts of the fort. It appears that during their travels some of the personnel of the Hudson's Bay Company were rock collectors. A number of interesting specimens of petrified wood with worm holes and some sections of branches were found during the excavations. Petrified wood is not found in the gravels of this area and must have come from some distance inland.

Clothing

Evidence of cloth and felt was found throughout the fort, especially in the trash pits. A finely beaded felt vest in Trash Pit No. 12 was too fragmentary to be saved, but from the number of small seed beads it must have been a fine looking garment.

Cloth remains were often encountered with the buttons where the copper had preserved small sections of cloth and the thread with which they were sewed on. One of the lead seals had been fastened over woolen cloth.

Shoe and boot remains were plentiful. They must have been handled in large quantities, because one request for prices on 2,530 pairs of assorted shoes, boots and galoshes was made by McLoughlin on November 3, 1842, from Lewis Flint of 46 King Street, Snow Hill, London. McLoughlin reports that this order was received before November 20, 1844, and the shoes were of a better quality than those made by Richard Surridge of Newgate Street, London. ^{47/} In view of such large orders, it is not all surprising that numerous boot and shoe soles and fragments were found.

Warre and Vavasour were both outfitted at Fort Vancouver in 1845 at the expense of Her Majesty's Government, and from the list of goods sold to Vavasour ^{48/} it is noted that the gentleman had purchased a fine beaver hat, frock coat, cloth vest, buckskin trousers, tweed trousers, white cotton shirts, silk handkerchiefs, one pair blucher shoes, one pair Warner shoes, 2 yards hair ribbon, 2 yards Highland gaiters, 9 yards lace, black braid, 1 pair ladies shoes, one Valencia vest, and 2 1/2 yards of white blanketing among other items.

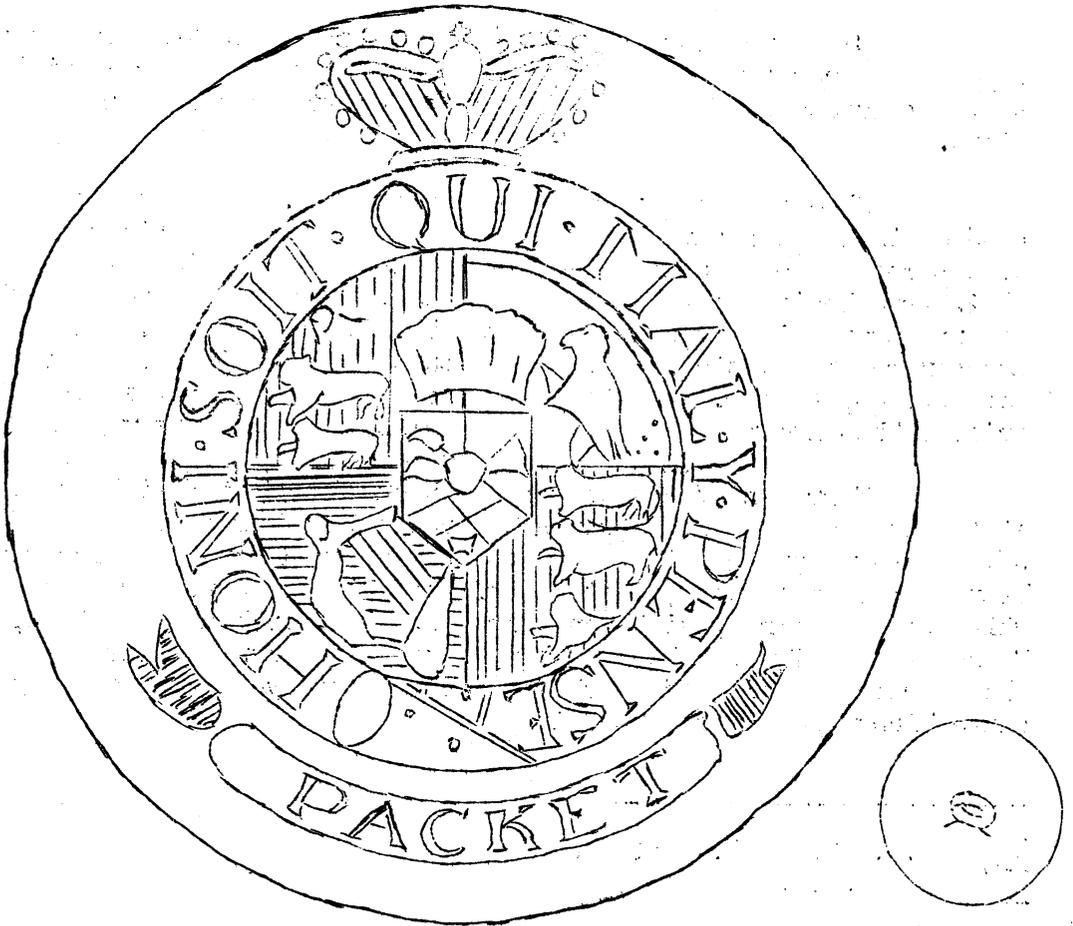
^{47/} H.B.S., VII, 13, footnote 3.

^{48/} Schafer, 96.

From this list it is evident that nothing was lacking for the gentlemen at Fort Vancouver. We question his purchase of the ladies shoes as a legitimate expense account item but surmise that he made good use of them.

Vavasour's account also shows that Mrs. McIntosh did \$12.22 worth of needlework. Perhaps she made up some of the yard goods into garments for him. Mrs. Pambrum was credited \$7.00 for garnished work.

Although quite perishable, enough remains of cloth were found to satisfy anyone of the quantity used at the fort. Undoubtedly fur and skin garments were plentiful, but unfortunately very few traces came to light.



Natural size.

Uniform button from Royal Mail packet ship.

Objects of Indian Manufacture

The economy of the Chinook Indians was largely that of a trading group. We might say that they prided themselves on being the middlemen for many commodities, only a few of which were of their own manufacture. Because of their strategic location in occupying the mouth and lower course of the Columbia River they controlled the native trade. This circumstance became especially important after the advent of vessels trading along the coast. However, for centuries they had been in this business of trading objects procured from the sea, either by themselves or by trade with other coastal tribes, to their inland neighbors. Oil obtained from the smelt, whale bone, sea shells, including the much desired dentalia, and furs were but a few of the items over which they controlled or tried to control the trade. The coming of the coastal traders and the fur companies caused considerable dissention among these natives because of the fact that the traders infringed on their monopoly.

For their own use the Chinook made many items of good quality which were also used by the traders and personnel of the forts. These included matting for floor and wall coverings, and baskets of fine manufacture which were so closely woven that they held water. Matting remains were found during the removal of the 3-sheave block (Plate XIII) in the area of the Beef Store. The matting, made of tule stems, was partially preserved in resin or asphaltum beneath the block. A few fragments of charred basketry were found during the excavations. Two well-made bone spoons or ladles were found in Trash Pit No. 4. One had engraving on the handle, while on the other the edges of the handle were scalloped.

Even though the area where the fort was built had never been occupied as a camp site or village by the natives, a number of stone flakes and flaked projectile points were found, some of which probably were dropped before the coming of white men. A total of twenty-one worked stone flakes was recovered, of which eight were broken projectile points and two were complete points.

A stone mortar measuring three inches in diameter by two and one quarter inches in thickness was also found in Trash Pit No. 4. Twelve large net sinkers or anchors came from the American period of Well No. 1.

Fourteen bone awls made from horse splint bones were also found in the American trash of Well No. 1.

The gentlemen of Fort Vancouver were reported to have had a collection of Indian materials on display in one of the rooms of the Bachelor's Quarters. It would be of great interest to know what happened to this, the first museum collection housed in the State of Washington.

SUMMARY AND CONCLUSIONS

The primary purpose of excavations at the site of Fort Vancouver was to rediscover the remains of the old fur trade post in order that land could be acquired for the establishment of a national monument. Secondary consideration for the excavations included the valuable information to be gained in regard to the architecture of the old fort and the historic objects recovered from the trenches. Excavations carried on from September 17 to November 10, 1947, accomplished the first objective. The four corners of the old fort were found, and portions of the stockade walls were exposed to study the method of construction. The foundations of the powder magazine were uncovered.

On June 19, 1948, President Truman signed Public Law 715 which provided for the transfer of not more than ninety acres of land for the establishment of Fort Vancouver National Monument. Additional archeological work was programmed in 1948 to determine the exact location and size of the buildings within the stockade. Because of later use of some of the fort area by the Spruce Production Corporation in World War I, much of the northeast area of the stockade was found to have been badly disturbed. However, the remains of the bakery, the Priest's House, and the fireplace of the Chief Factor's Residence were discovered.

Again in 1950 and in 1952 archeological crews worked at Fort Vancouver. At the close of the excavations in October 1952 the four season's excavations and the historical research by Dr. John A. Hussey had resulted in a goodly amount of data on this particular establishment. Concurrent excavations at other fur trading posts - Fort Walla Walla, Fort Spokane, and Fort Okanogan - have greatly widened our knowledge of this important era in the history of the fur trade period.

At Fort Vancouver the remains of stockade walls have revealed the growth of this establishment from its beginning in 1829 to its final abandonment in 1860. Its development was retarded during the earlier years because of the strain put on the Hudson's Bay Company personnel in meeting the competition of rival traders in this lucrative business. Intermittent fever and the loss of supply ships also hindered the construction of necessary housing and storage facilities. By 1838 the organization seems to have reached its stride and many important installations at Fort Vancouver and at interior and coastal ports had been made. Trade expanded into other fields and the Puget's Sound Agricultural Company was created to fill the food needs of the company posts as well as distribute the products to Russian Alaska and Spanish California. In 1849 the main fur trade headquarters was transferred to Fort Victoria on Vancouver Island, but the importance of Fort Vancouver continued in the economy of the northwest.

Excavations revealed the methods of construction of the stockade walls, the bastions, the gates, and the buildings within the stockade walls. Except for one building, the powder magazine, all construction was

of native Douglas fir as far as is known from the identifications made by the Forest Products Laboratory in Madison, Wisconsin. Brick and tile were being imported from England, but quantities were also being manufactured locally. Native rock was in use for chimneys and fireplaces. Douglas fir slabs were used for footings for most of the buildings. Sometimes these were laid in fine cinders from the blacksmith shop. Lime for plaster and mortar was made from coral brought from the Hawaiian Islands.

The area of the fort included almost 249,000 square feet, of which only a small portion was actually excavated. After exploratory trenching determined the locations of the stockade walls, the remainder of the excavations were largely in search of the structures located within the stockade. Evidence was found of the following structures in addition to the stockade walls:

- 2 Bastions
- 2 Wells
- 18 Trash pits
- 4 Large warehouses
- 1 Beef store (floor remains)
- 1 Powder magazine
- 1 Wheat store
- 1 Office (new)
- 1 Jail
- 1 School house (Owyhee Church)
- 1 Priest's House
- 1 Chief Factor's Residence
- 1 Dwelling house
- 1 Trade store
- 1 Blacksmith shop
- 1 Iron store
- 1 Bakery
- 1 Root house

70

Structures not found but searched for included:

- 1 Old office
- 1 Roman Catholic Church
- 2 Carpenter shops
- 2 Kitchens
- 1 Harness shop

7

In addition to the above structures located within the stockade the remains of those outside could undoubtedly be found. In general it is believed that the areas in which they were located have not been materially changed since the time of abandonment. If anything, probably a protective earth covering would be found to have accumulated over the areas.

The almost unbelievable quantity of historical objects found during the excavations verifies the thesis of how important Fort Vancouver was in the period from 1829 to 1860. However, when it is considered that almost every object found had been broken or discarded, these objects were a mere fraction of the tonnage of merchandise and supplies handled at Fort Vancouver. The scientific information alone which was gained from the study of the historic objects was well worth the cost and efforts of the project. Now, for the first time, there is available an organized three-dimensioned amount of data on artifacts from a specific period in the British and American fur trade era.

From the listings of the many objects found during the Fort Vancouver excavations we realize that life during those times, although lonely to some coming directly into the wilderness from England, was full to those who were occupied with the great activity imposed upon them by the running of a huge business enterprise. Certainly Commander Wilkes caught the spirit and importance of the fort in this description. 11/

"The Company's establishment at Vancouver is upon an extensive scale, and is worthy of the vast interest of which it is the centre. The residents mess at several tables: one for the chief factor and his clerks; one for their wives (it being against the regulations of the Company for their officers and wives to take their meals together); another for the missionaries; and another for the sick and the Catholic missionaries. All is arranged in the best order, and I should think with great economy. Everything may be had within the fort: they have an extensive apothecary shop, a bakery, blacksmiths' and coopers' shops, trade-offices for buying, others for selling, others again for keeping accounts and transacting business; shops for retail, where English manufactured articles may be purchased at as low a price, if not cheaper, than in the United States, consisting of cotton and woollen goods, ready-made clothing, ship-chandlery, earthen and iron ware, and fancy articles; in short, every thing, and of every kind and description, including all sorts of groceries, at an advance of eighty per cent on the London prime cost. This is the established price at Vancouver, but at the other posts it is one hundred per cent, to cover the extra expenses of transportation. All these articles are of good quality, and suitable for the servants, settlers and visitors. Of the quantity on hand, some idea may be formed from the fact that all the posts west of the Rocky Mountains get their annual supplies from this depot."

11/ Wilkes, IV, 328.

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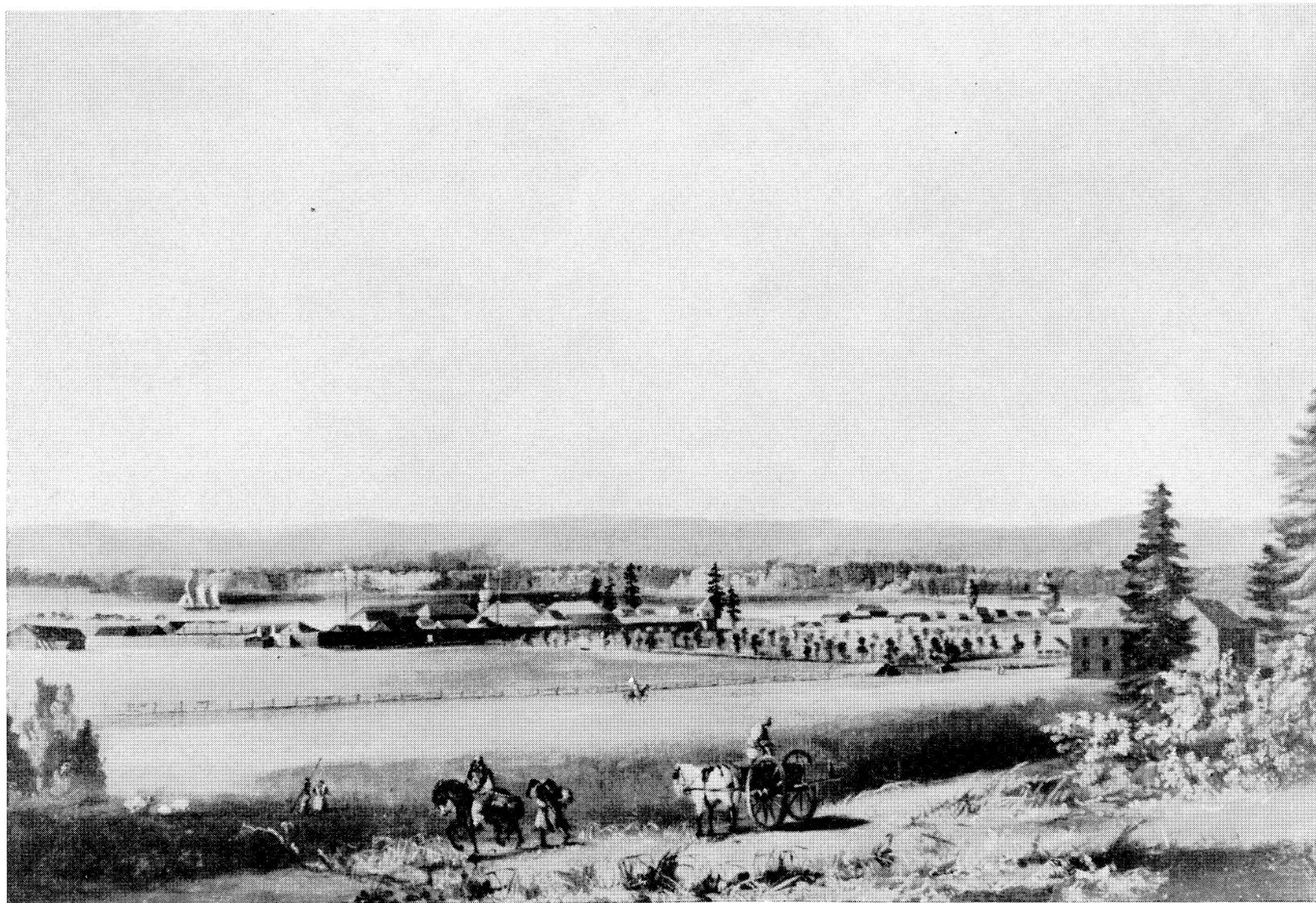
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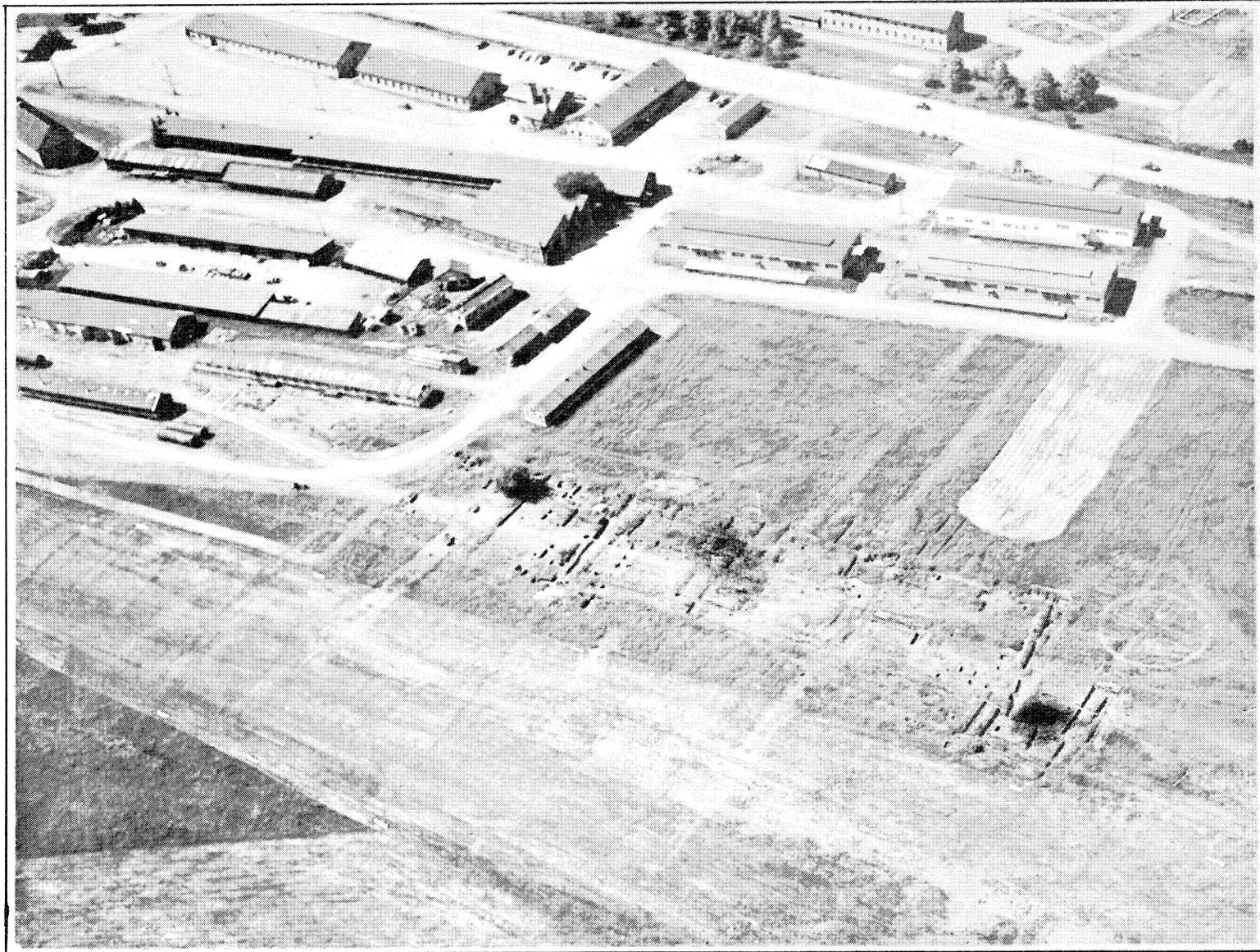
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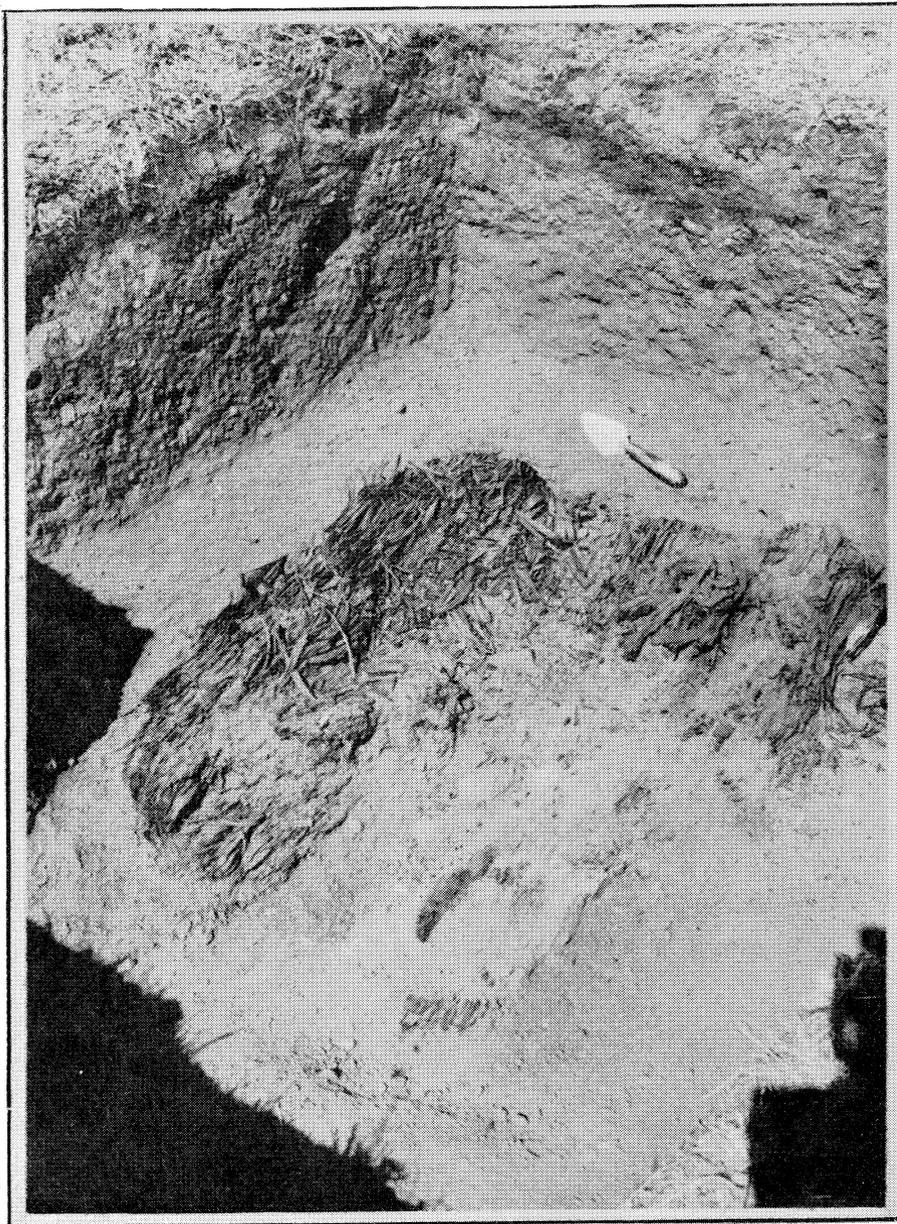
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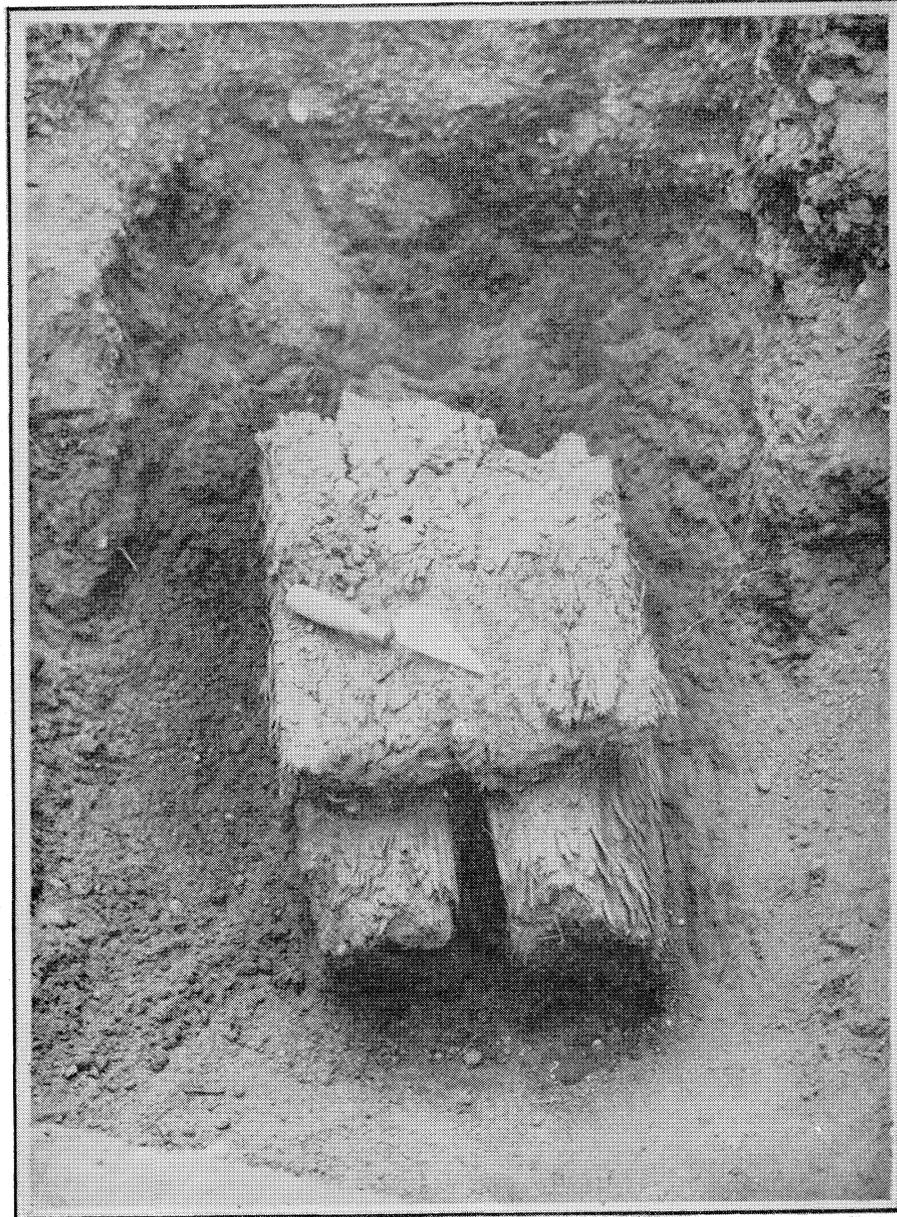
A painting of Fort Vancouver from the Coe collection
at the Yale University Library. The name of the artist is unknown.



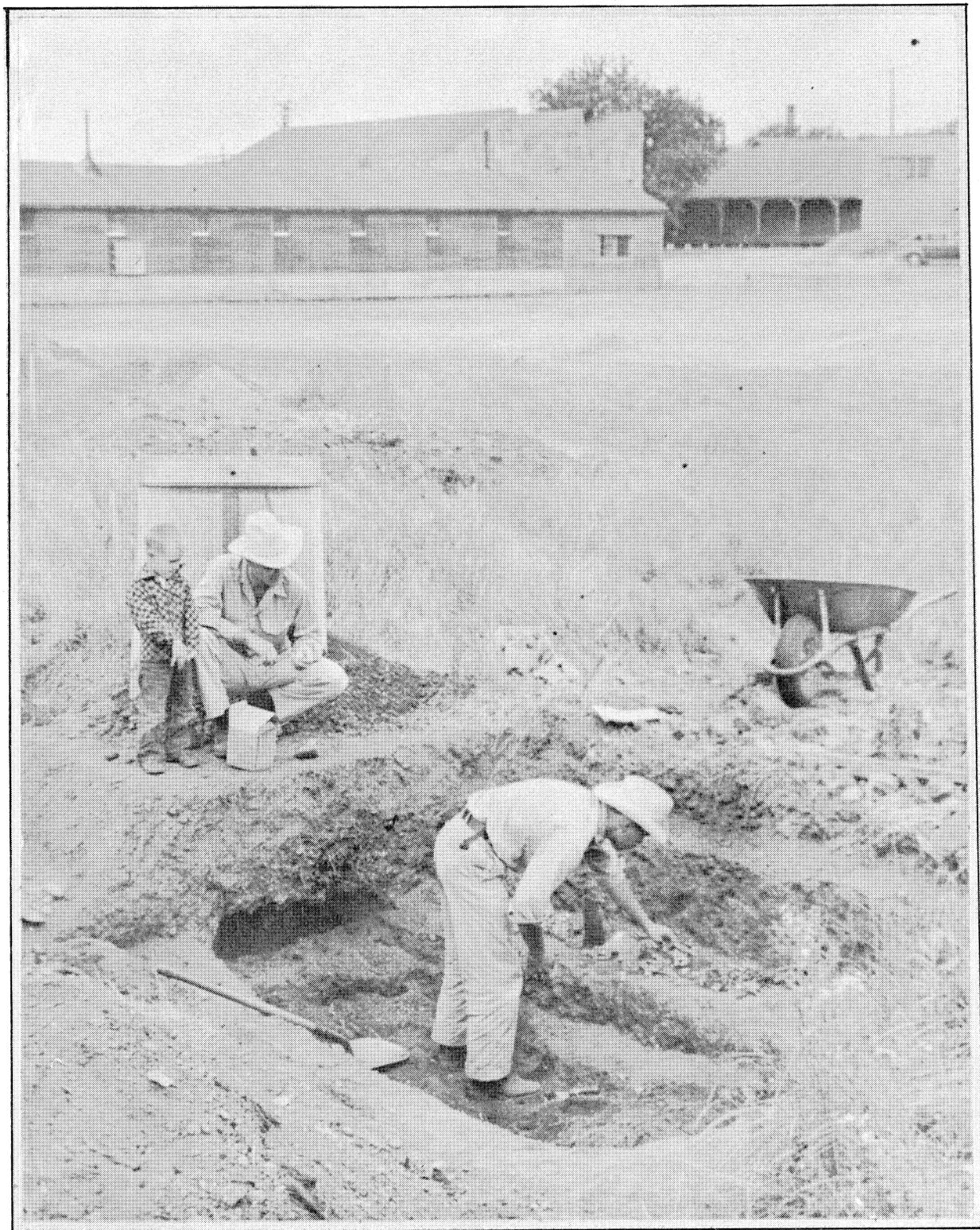
Aerial view showing the 1950 excavations. Circle on right is foundation of Spruce Mill burner. White spot in circle marks northeast corner. White square on left marks foundations of bastion.



A. Typical slab footing found for most of the buildings.

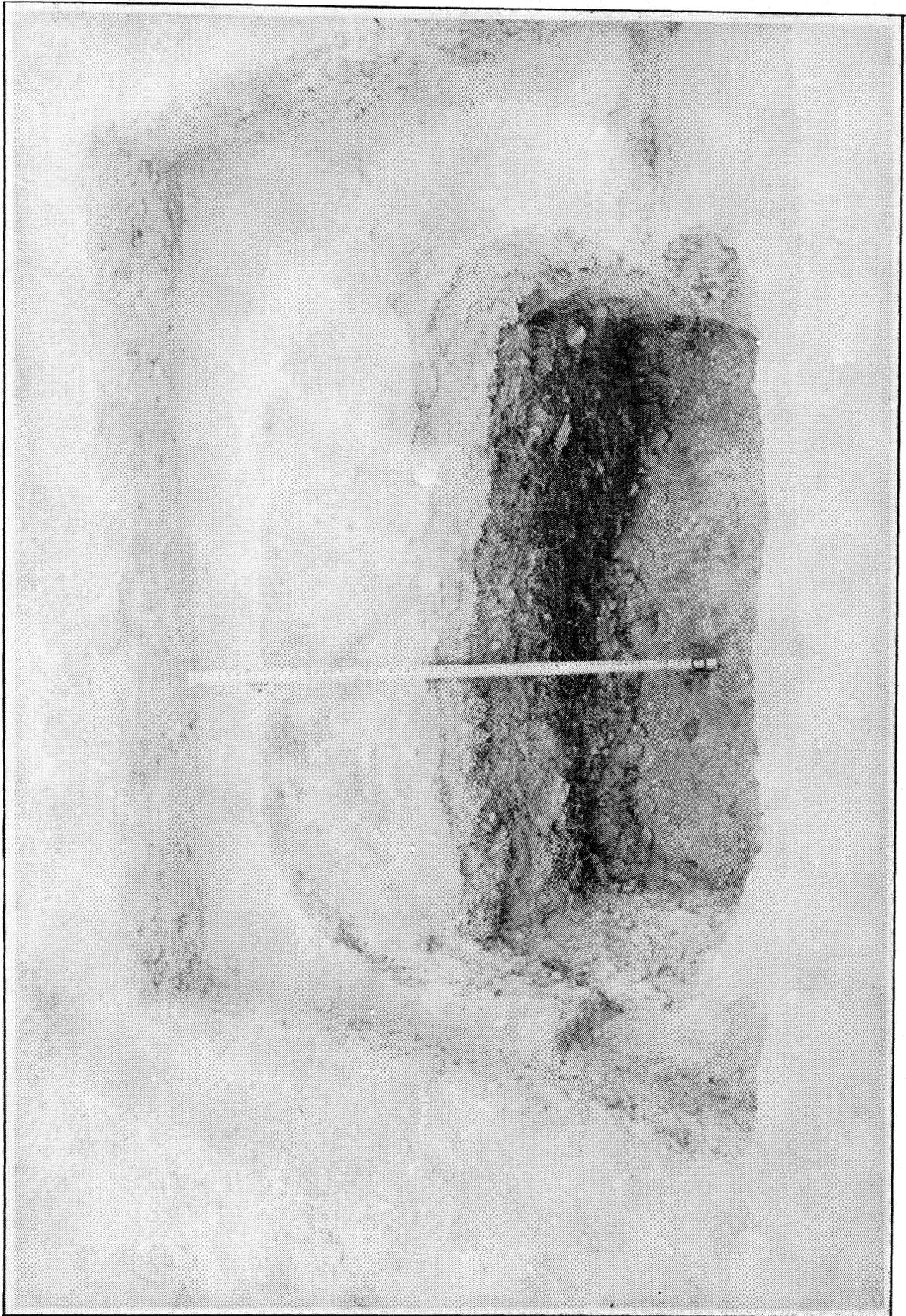


B. Block footing found in northeast corner of Chief Factor's house.

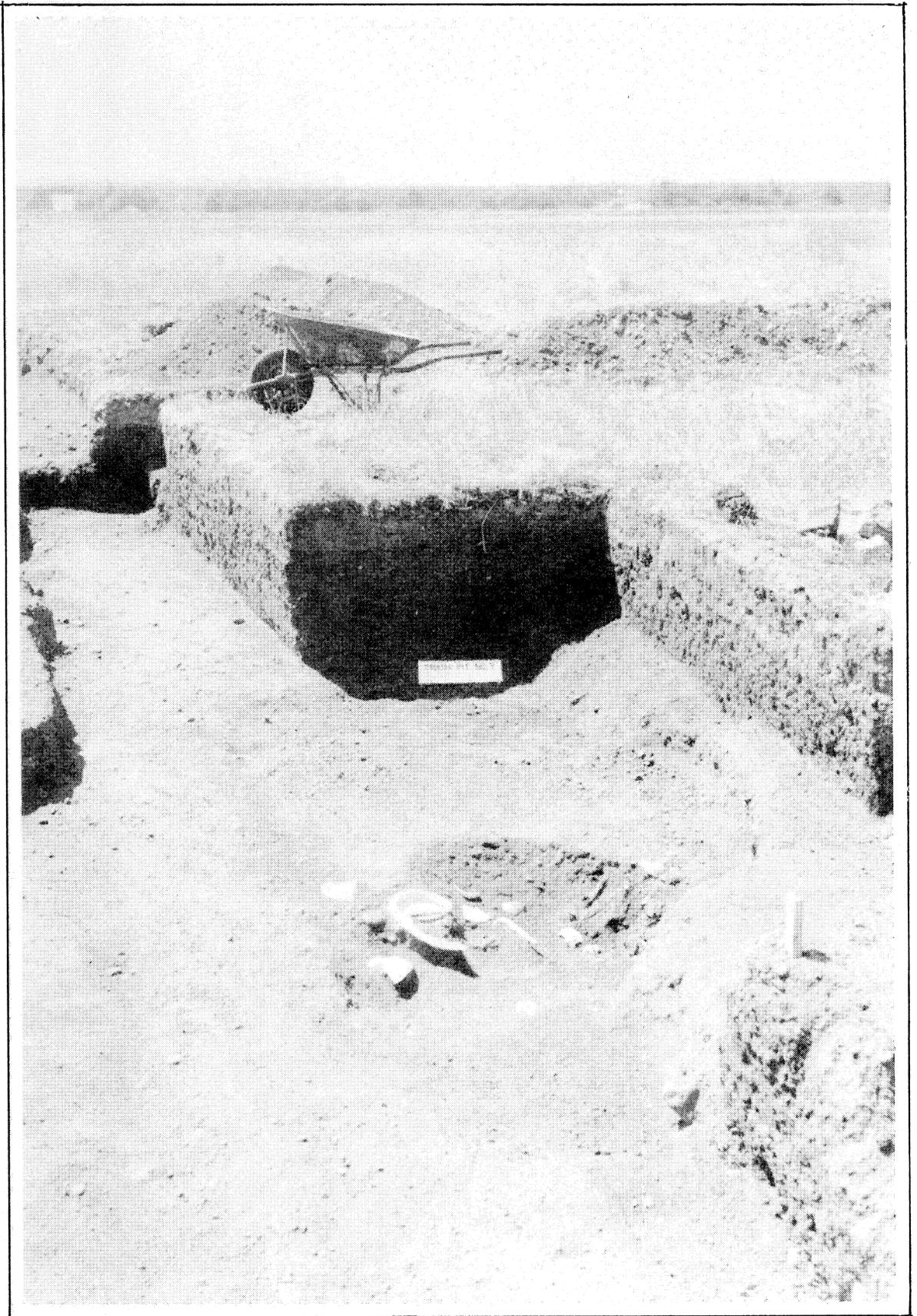


Courtesy Betty Huntress

Excavation of Trash Pit No. 6



Trash Pits 8 and 9
Upper portion (No. 8) was burned to an orange color.



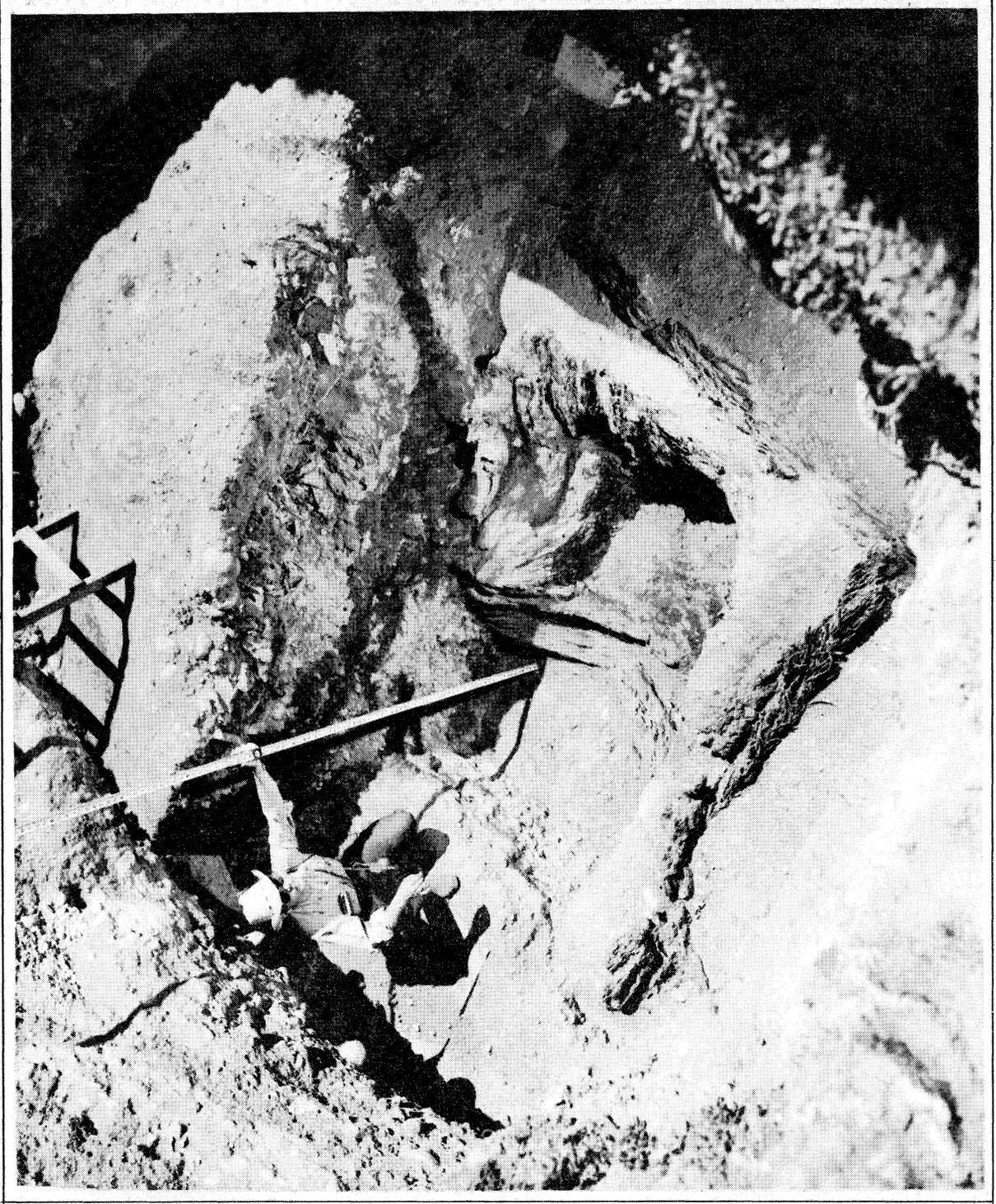
Depth at which outline of Trash Pit No. 7 was discovered.



Bottom of Trash Pit No. 15 showing plank flooring and part of plank lining.



Rich concentration of broken earthenware found in Trash Pit No. 13.



Well No. 1 - Beginning of timbered section of well



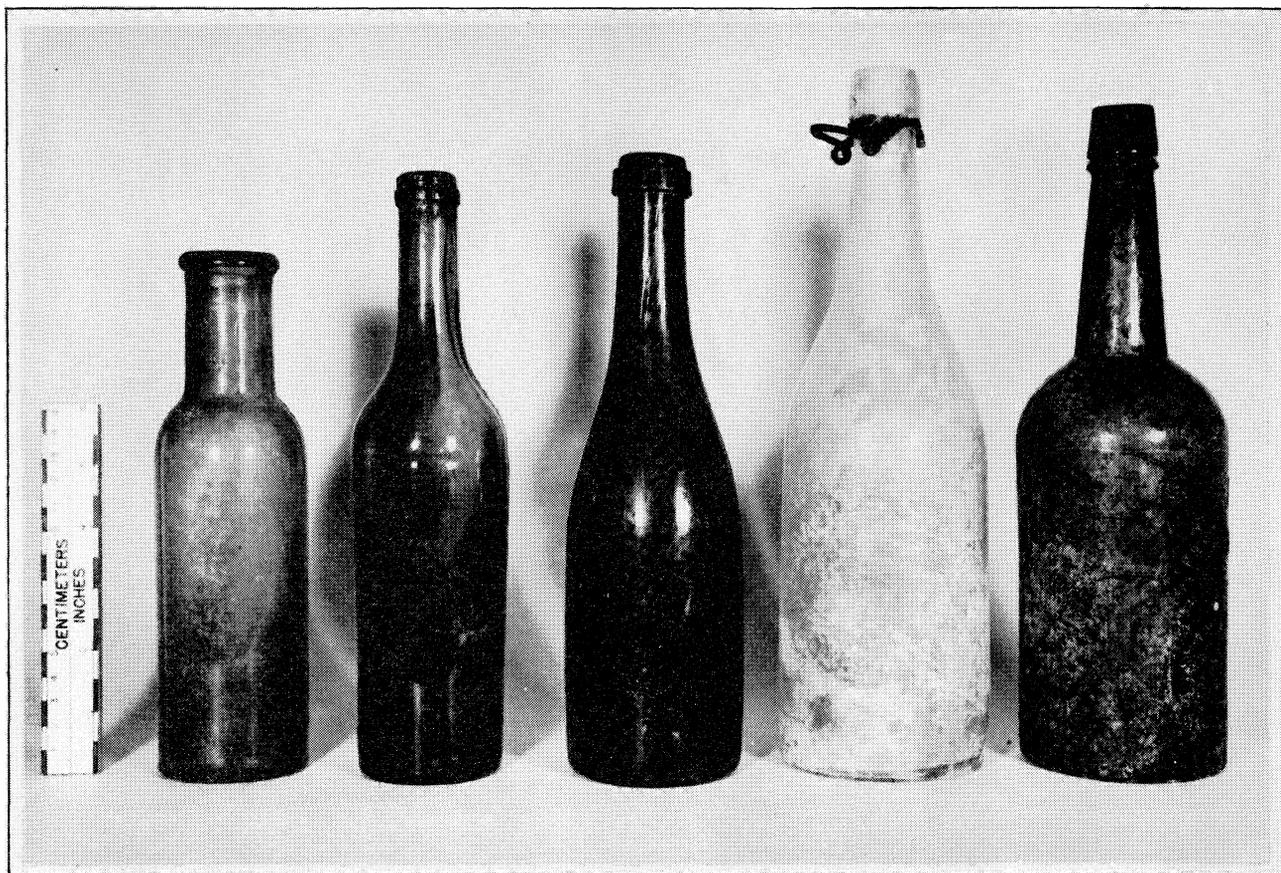
Top of Well No. 2 showing huge boulders used for lining.



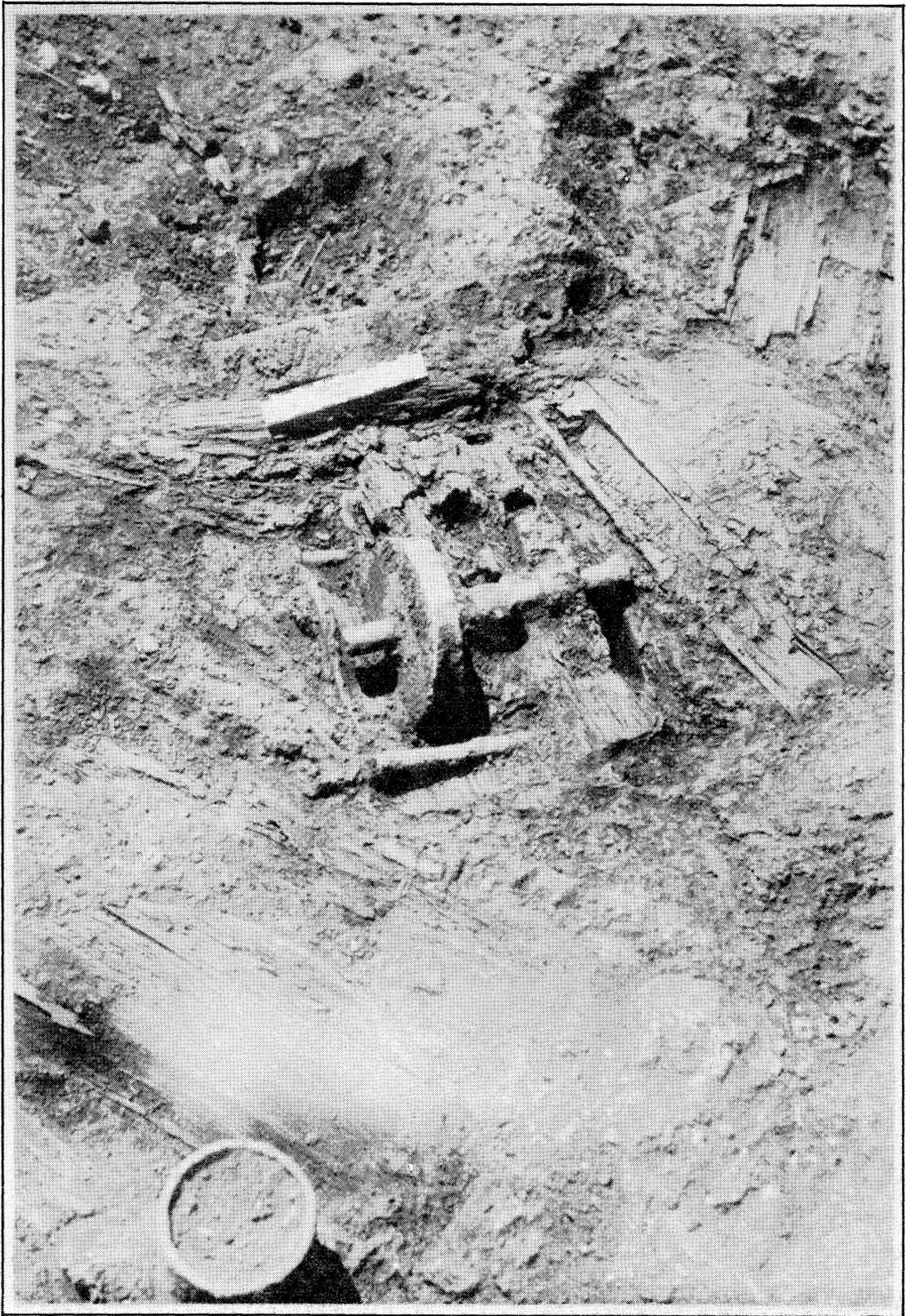
Excavations of the two gate posts of the southwest gate, Fort Vancouver.



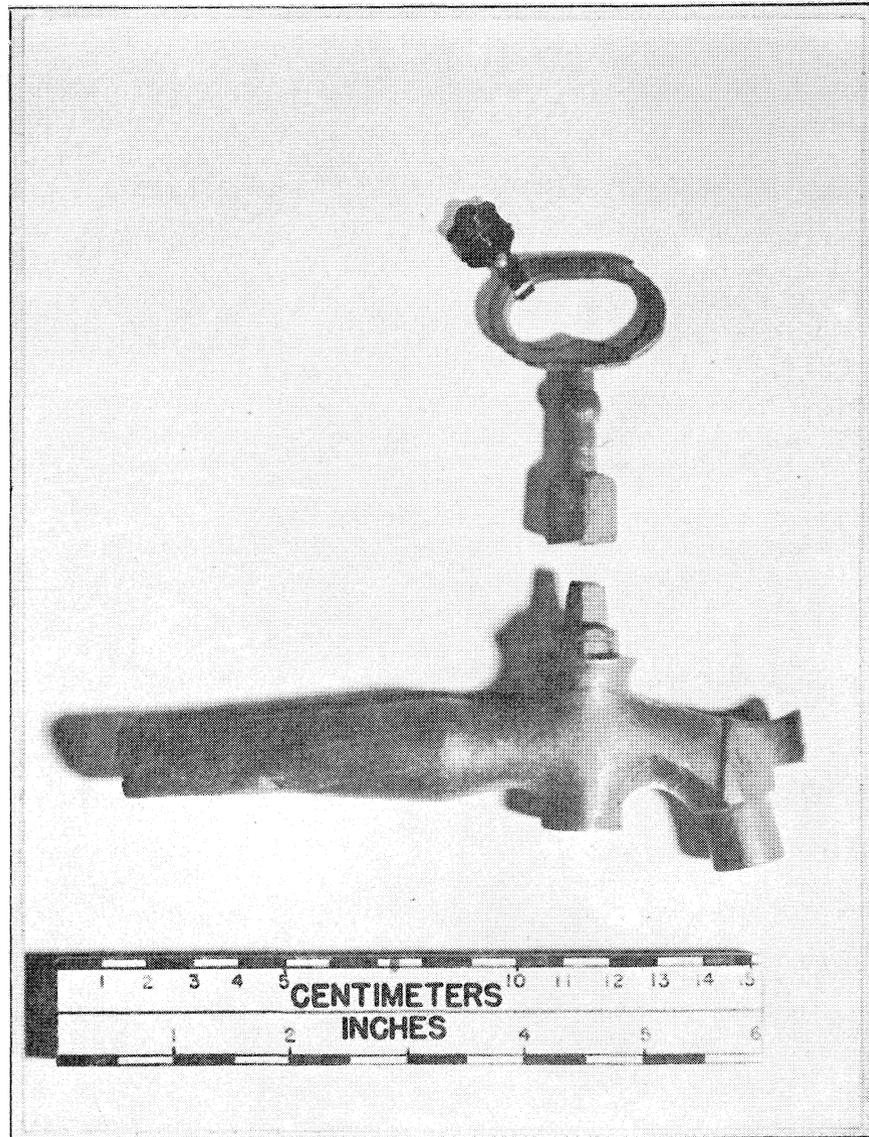
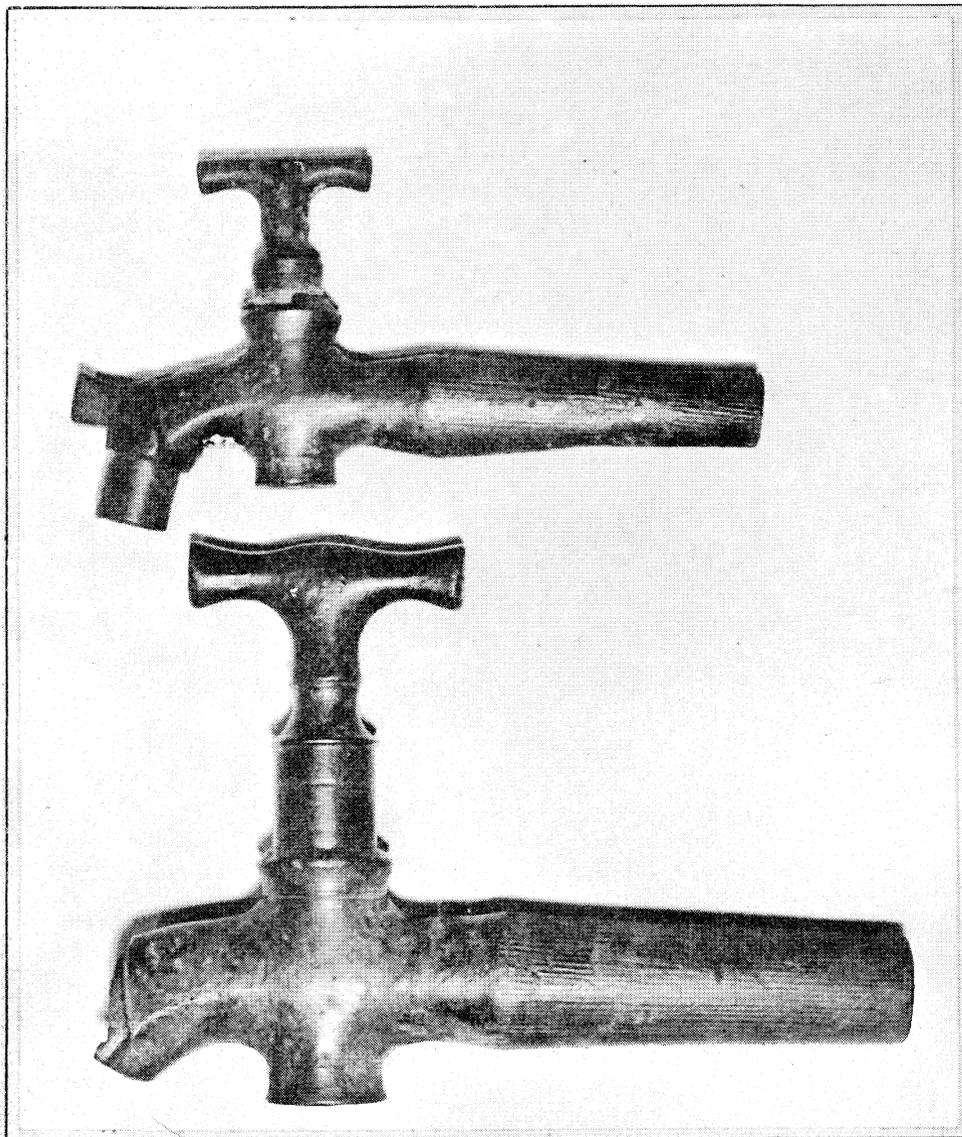
Hudson's Bay Company rum bottle



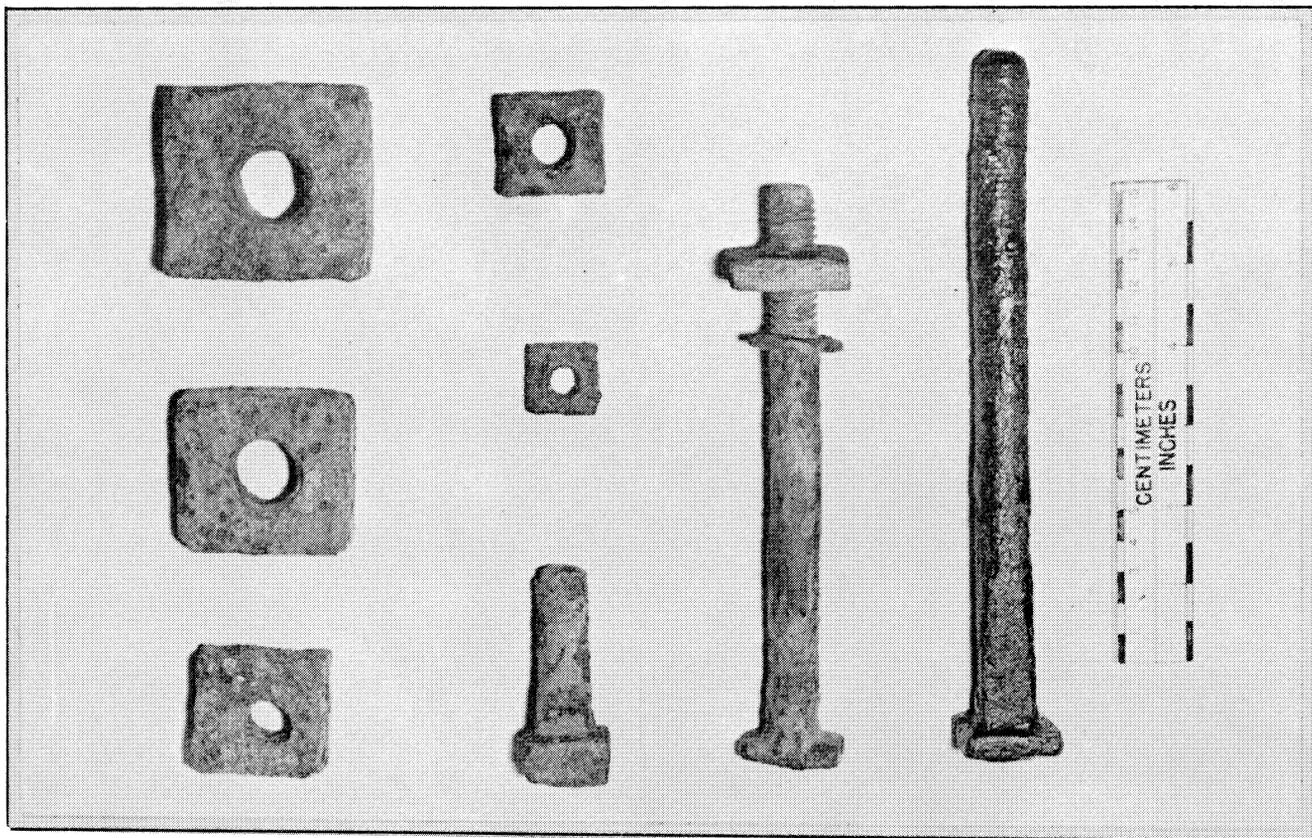
Bottles typical of the American Period



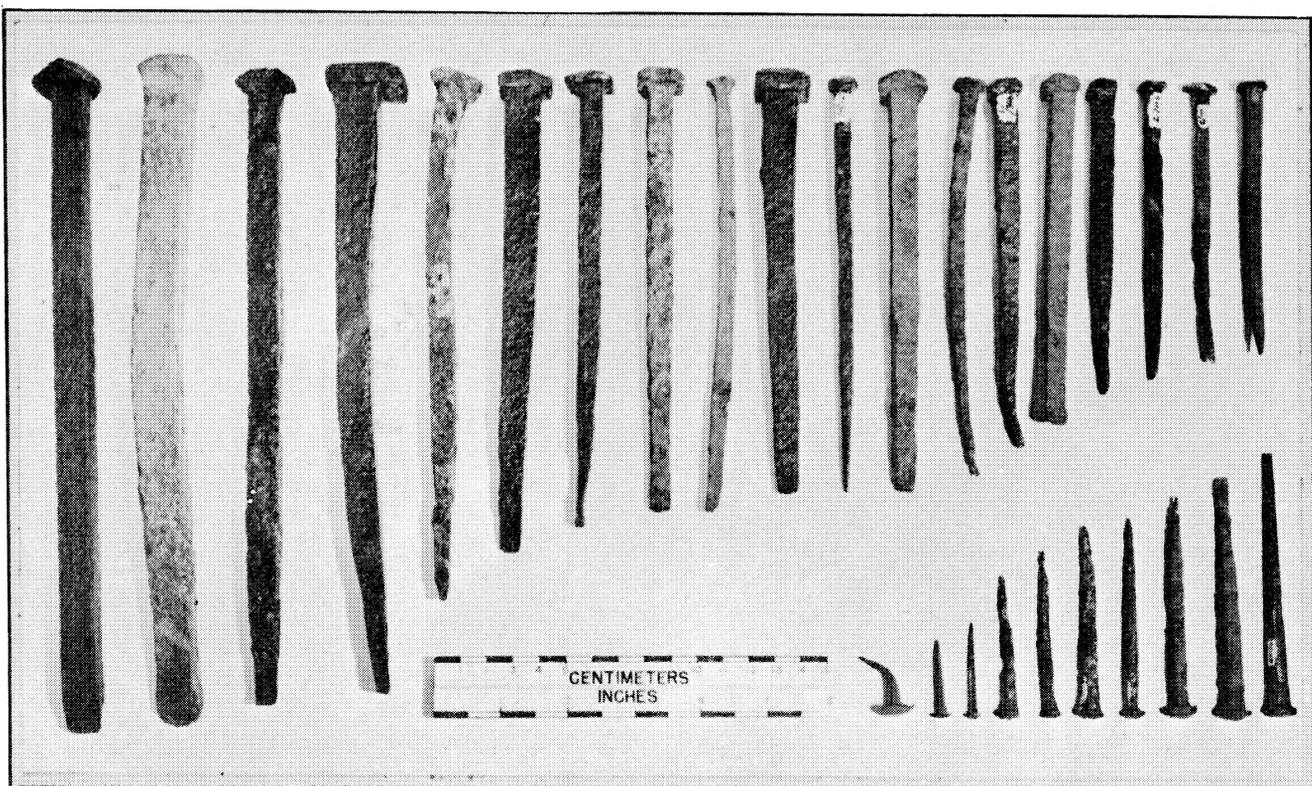
Wooden flooring and three-sheaved wooden block found
in Beef Store.



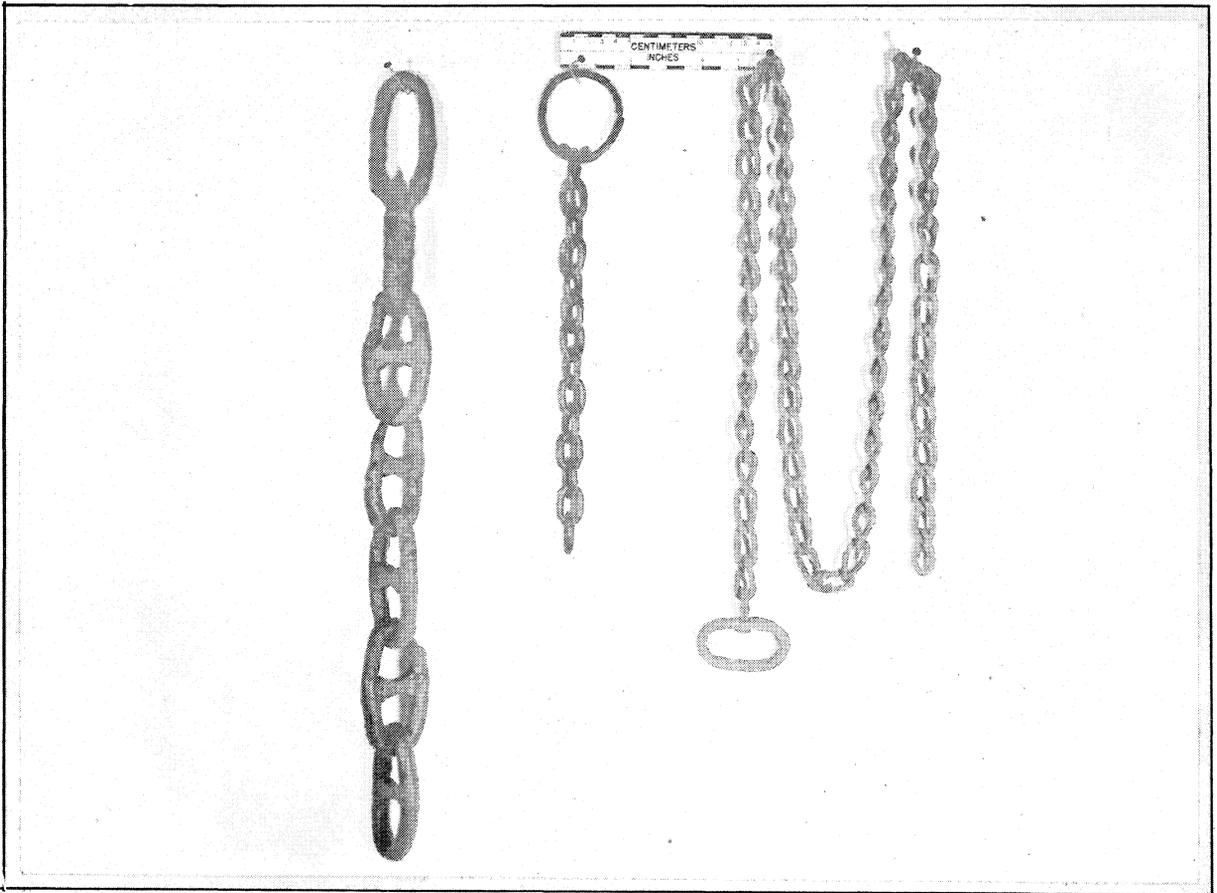
Typical brass spigots of the Hudson's Bay Company period. Example on right opened and closed with key.



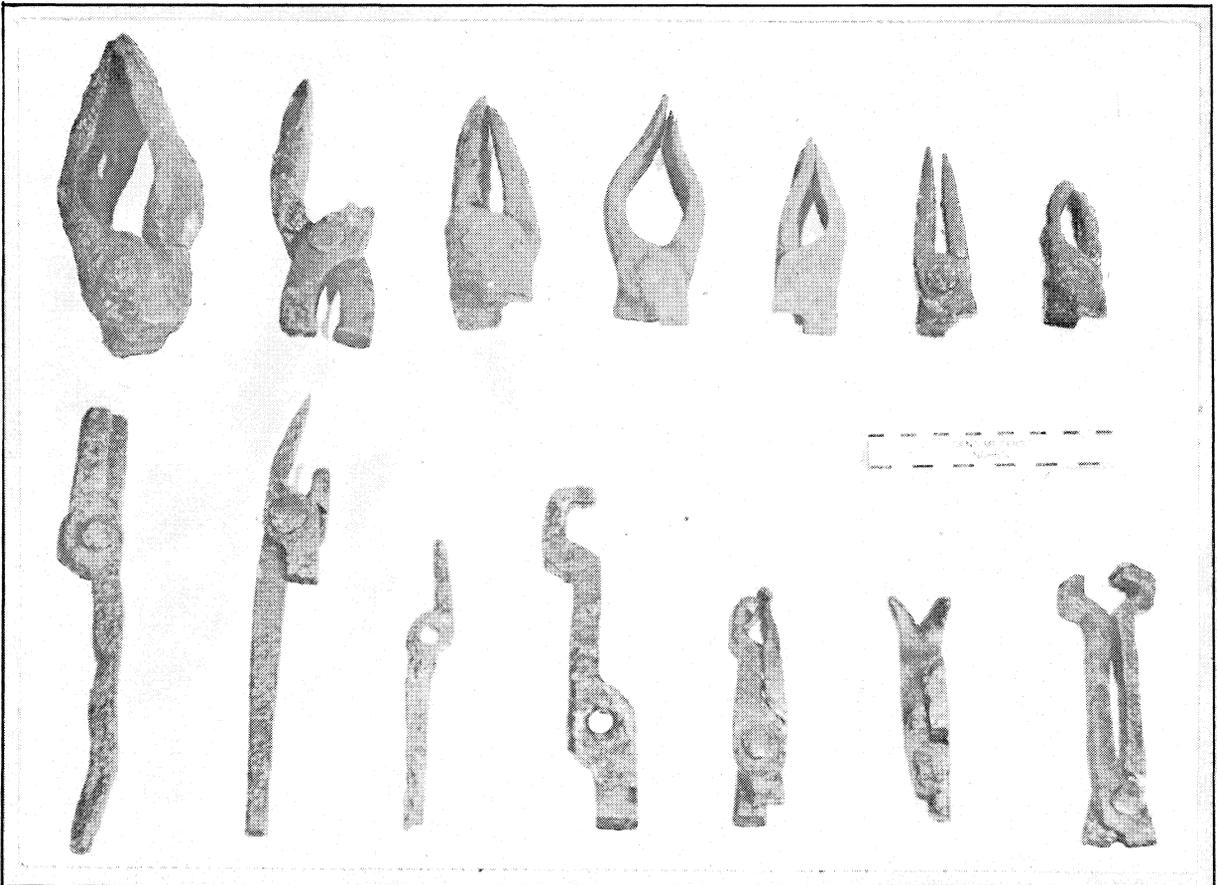
A. Typical nuts and bolts



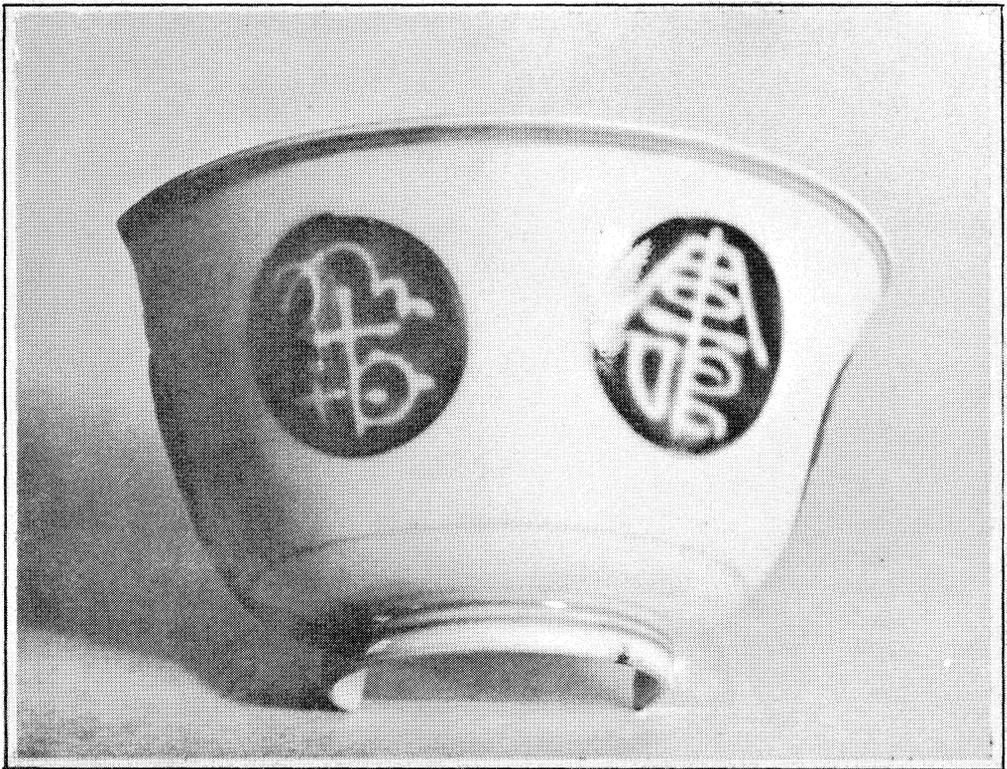
B. Nails and spikes



A. Chains. One on right from beaver trap.



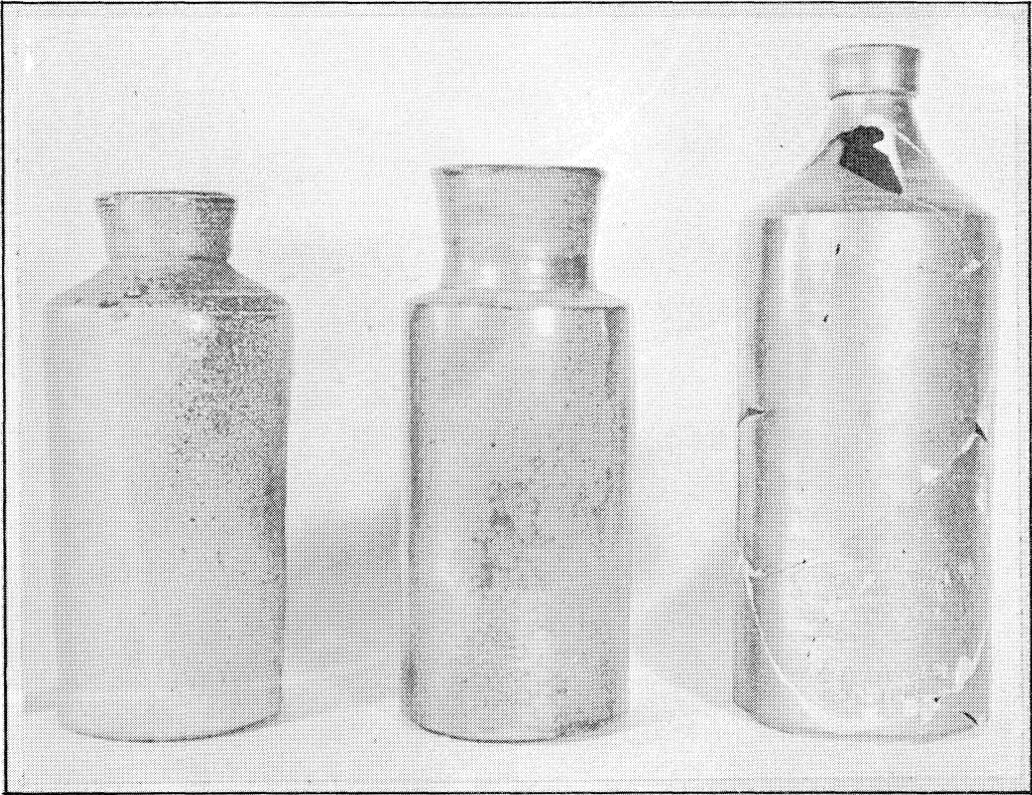
B. Blacksmith tongs.



A. Chinese porcelain cup



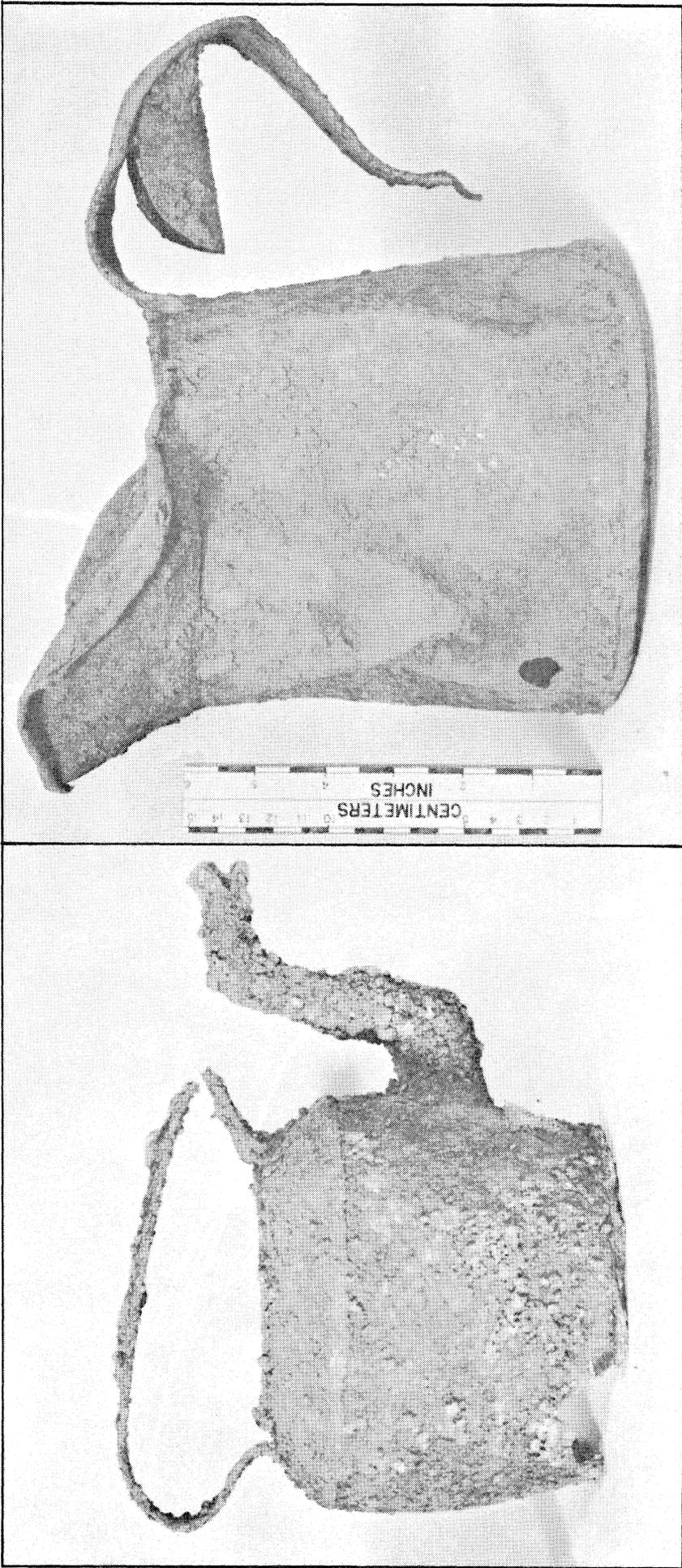
B. Chinese porcelain plate



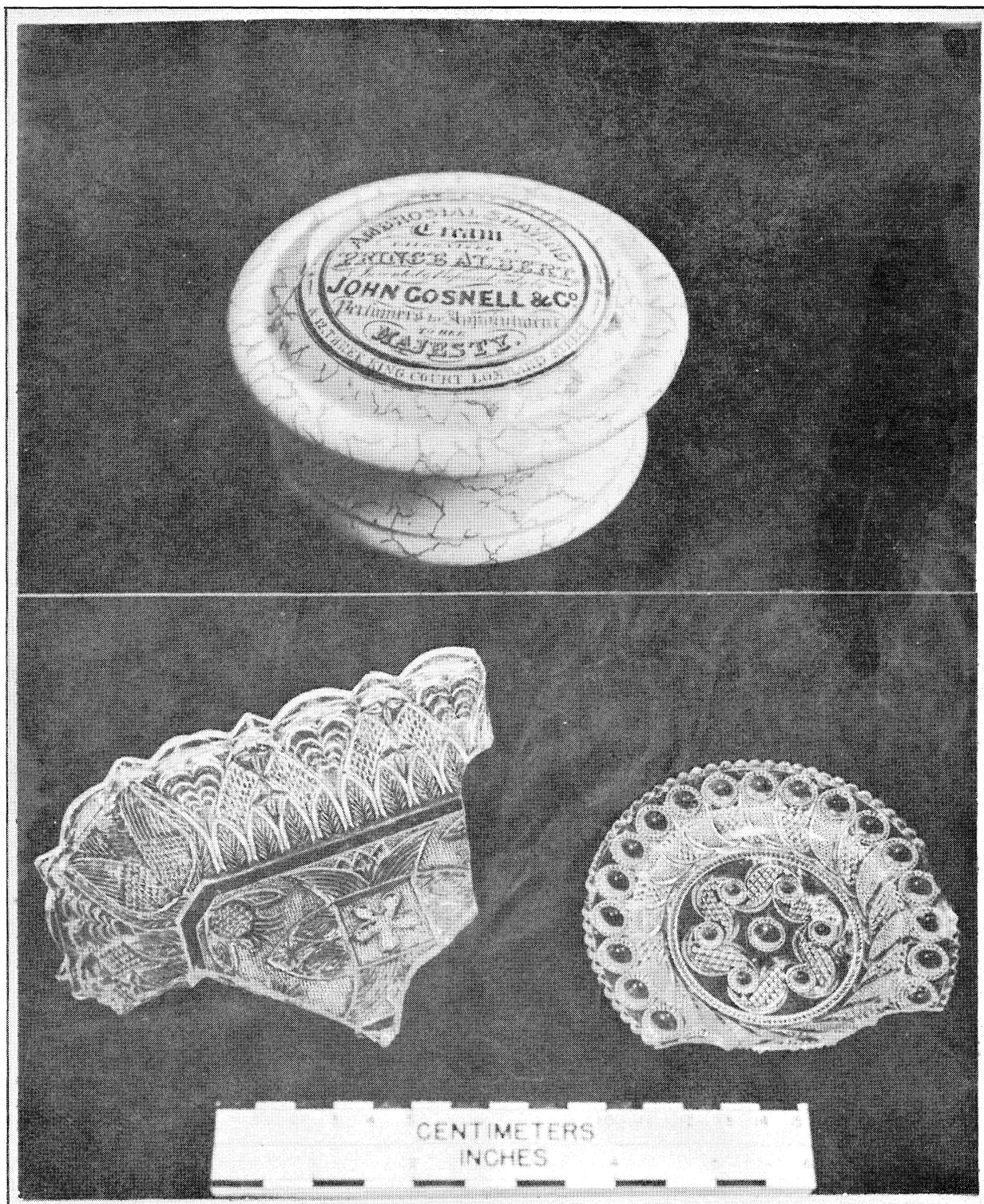
A. Crockery Ale Bottles



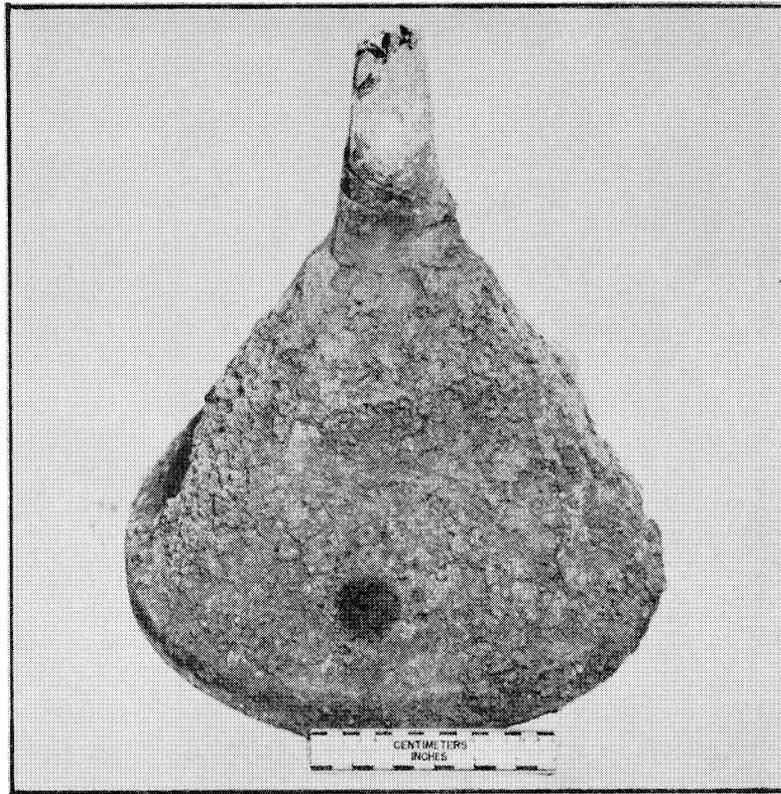
B. Crockery Jars



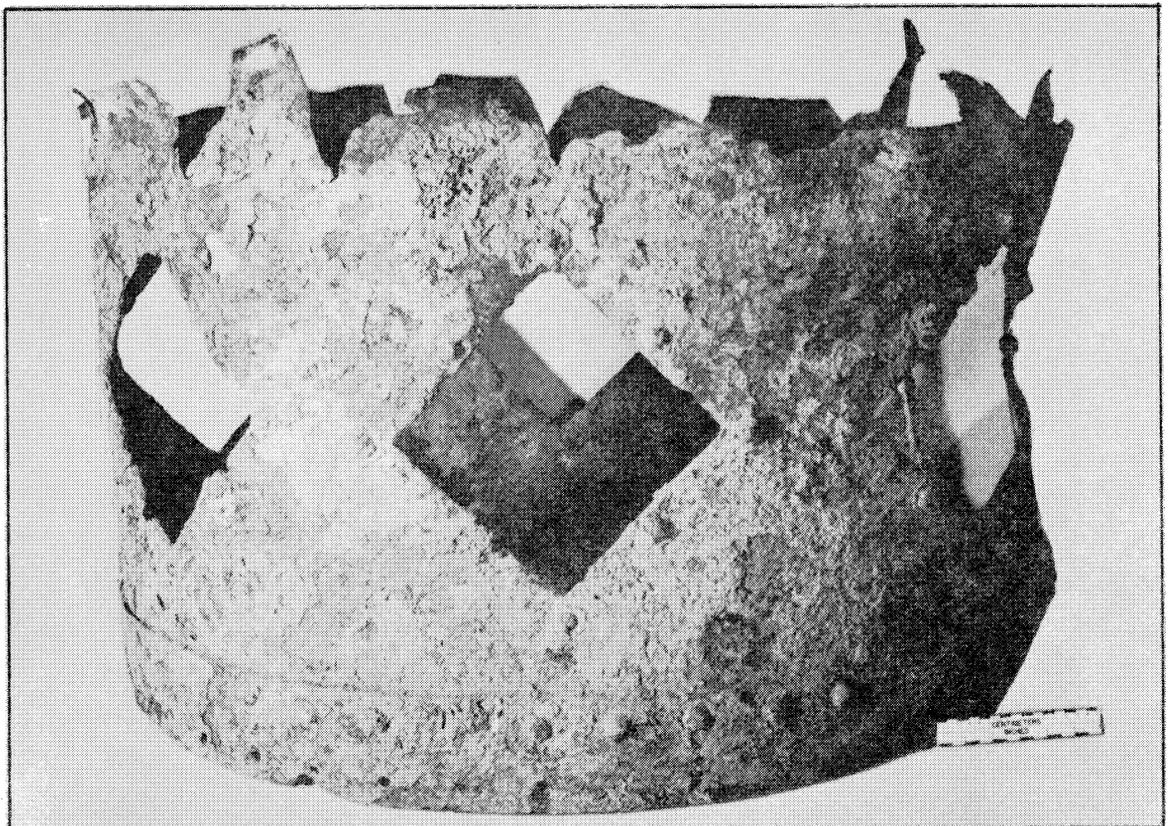
Iron teakettle and measuring can



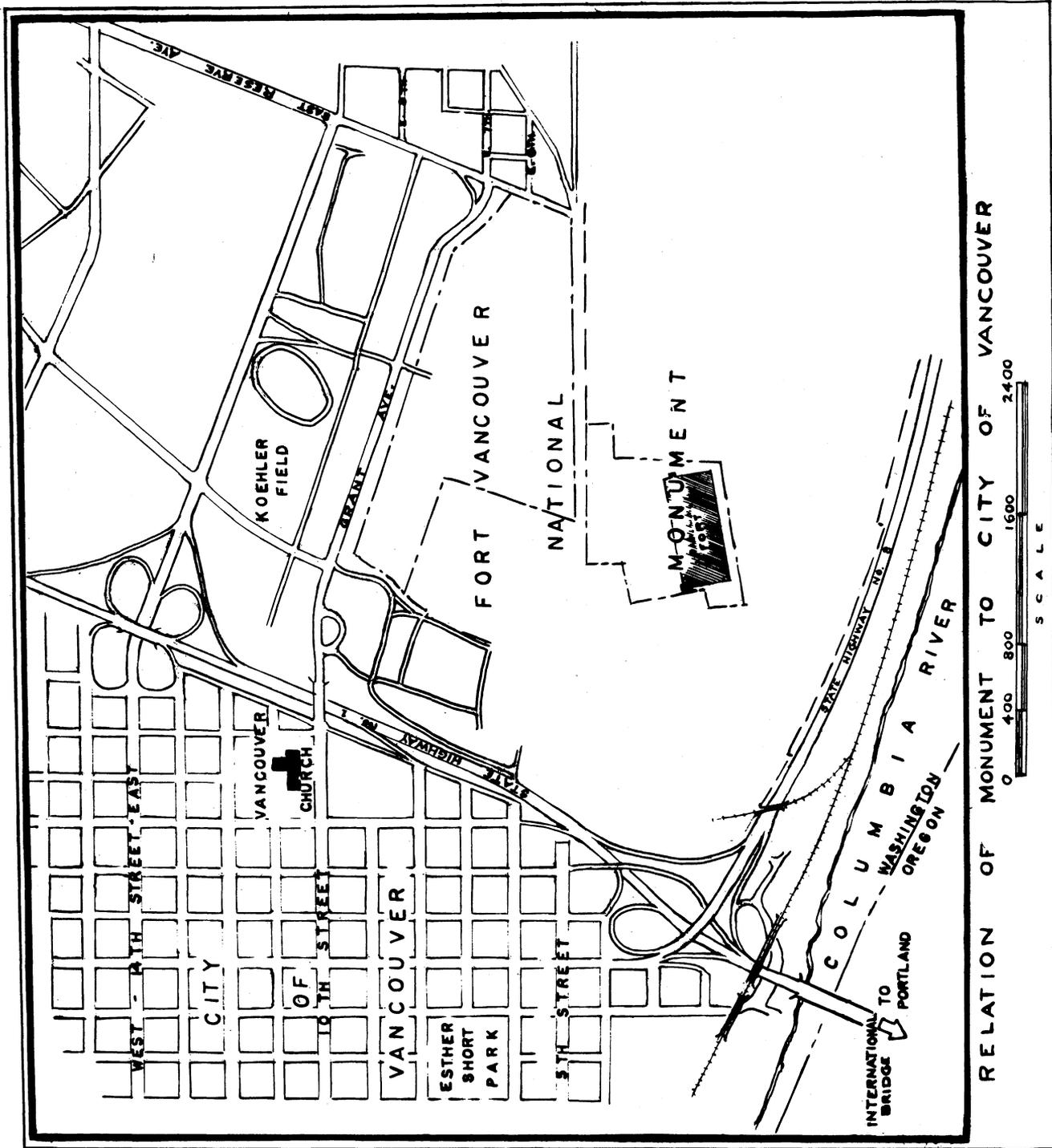
Pomade jar and pressed glass found in excavation.



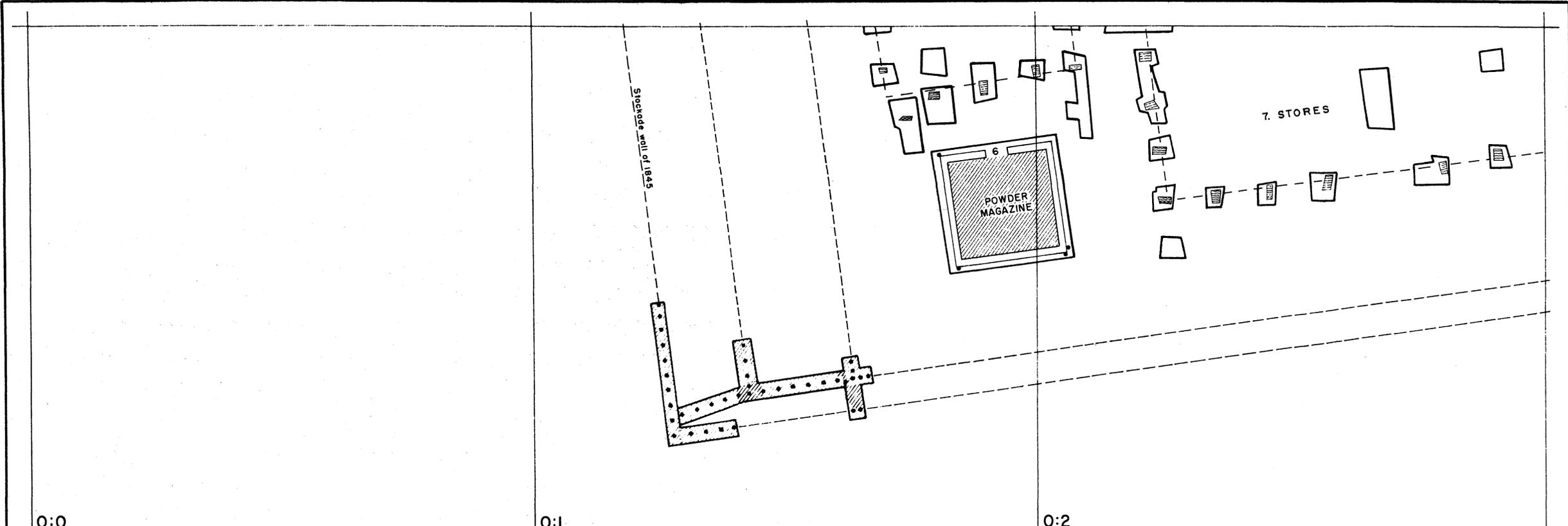
A. Sheet metal funnel



B. Iron object of unknown use



RELATION OF MONUMENT TO CITY OF VANCOUVER



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0:1

0:2

7	8	9
4	5	6
1	2	3

INDEX TO ADJOINING SHEETS

LEGEND

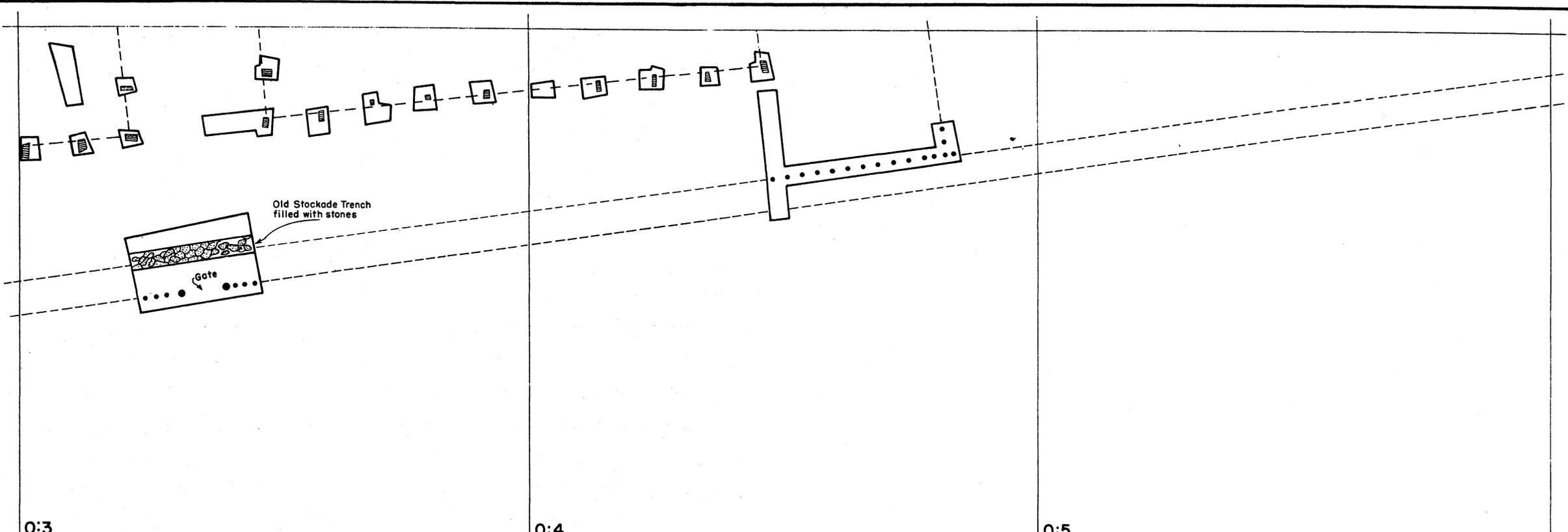
- Excavations ---- 1947
- Excavations ---- 1948
- Excavations ---- 1950
- Excavations ---- 1952
- Wooden footings and sills
- Posts



UNITED STATES
 DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 HISTORY DIVISION
 SAN FRANCISCO-CALIFORNIA

ARCHEOLOGICAL EXCAVATIONS
 PROPOSED FORT VAN COUVER NATL MONUMENT--
 FORT VAN COUVER-WASHINGTON
 COLUMBIA RIVER

N. P. S. REGION IV.
 FOR History Div.
 DATE Dec. 1953
 DRAWN BY D.H.
 CHECKED BY L.R.C.
 SHEET 1 OF 9
 CODE NO. XLV/109
 DRAWING NUMBER
 RS
 VAN-10752



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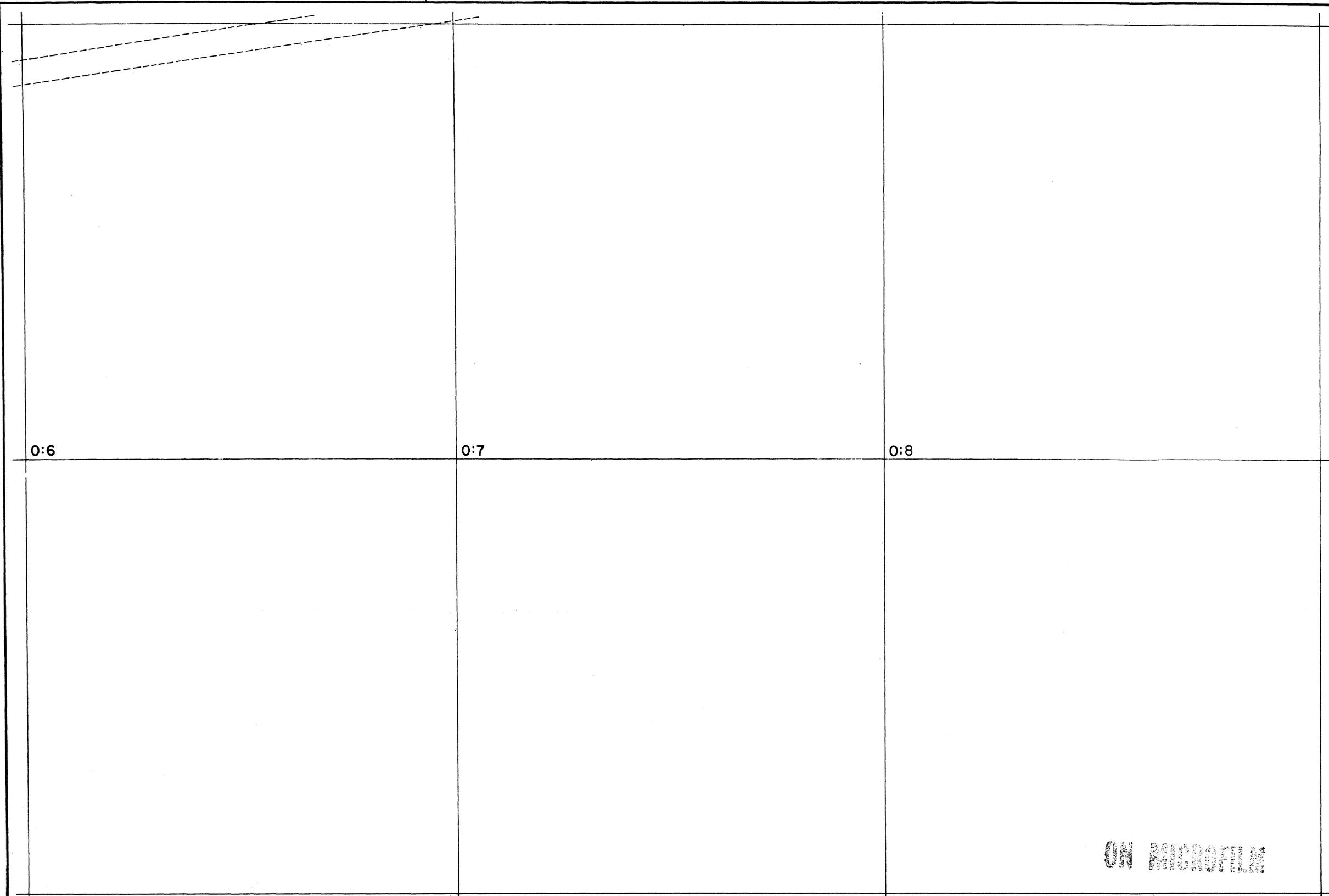
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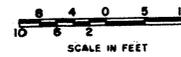
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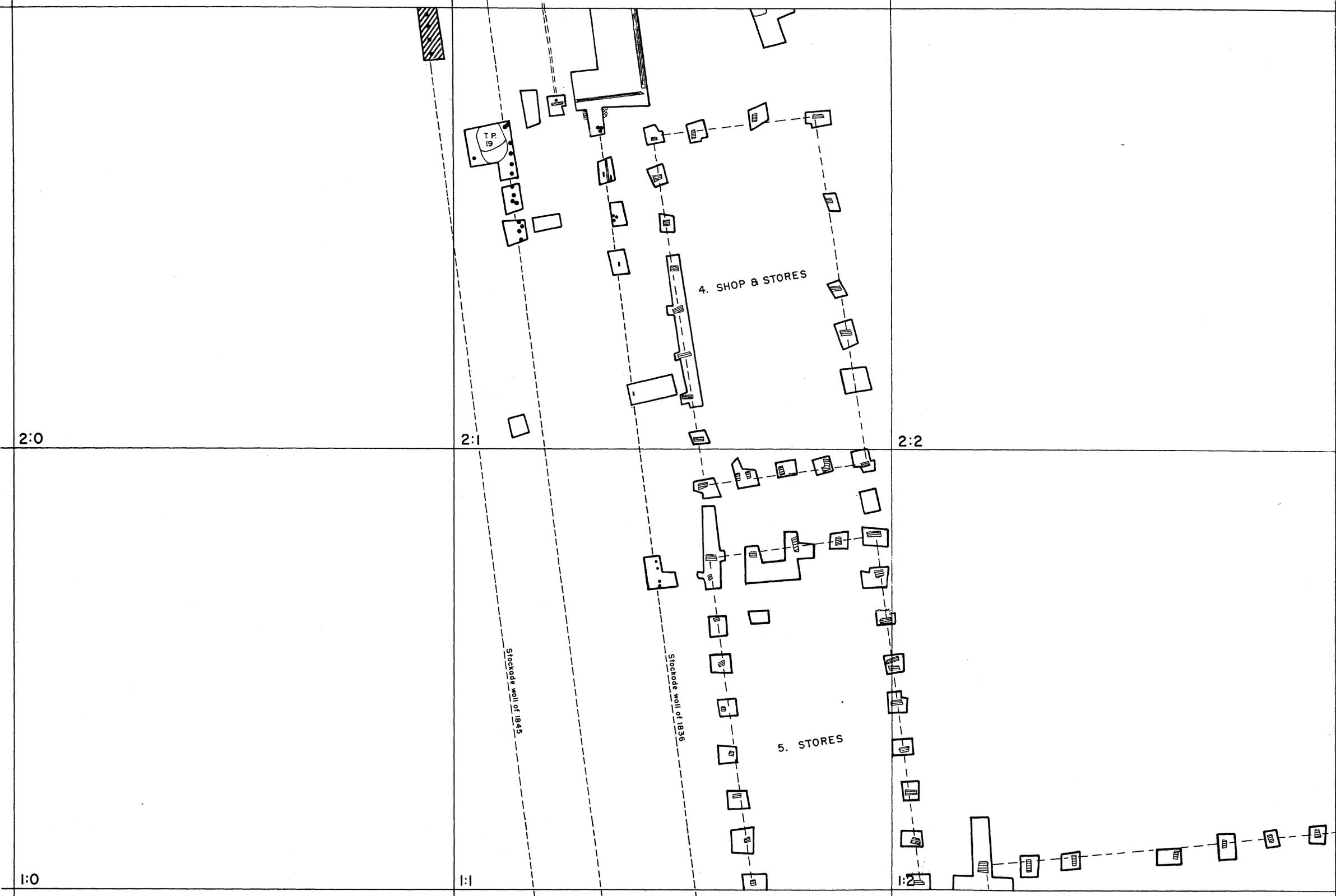
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UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE HISTORY DIVISION SAN FRANCISCO-CALIFORNIA	N.P.S. REGION IV FOR History Div. DATE Dec. 1953 DRAWN BY D.H. CHECKED BY L.R.C. SHEET 3 OF 5 CODE NO. XLV/100 DRAWING NUMBER
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Stockade wall of 1845

Stockade wall of 1836

4. SHOP & STORES

5. STORES

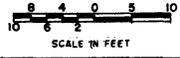
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ARCHEOLOGICAL EXCAVATIONS
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SPRUCE MILL
STRINGER

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8. STORES

Stockade Line of 1829

ON MICROFILM

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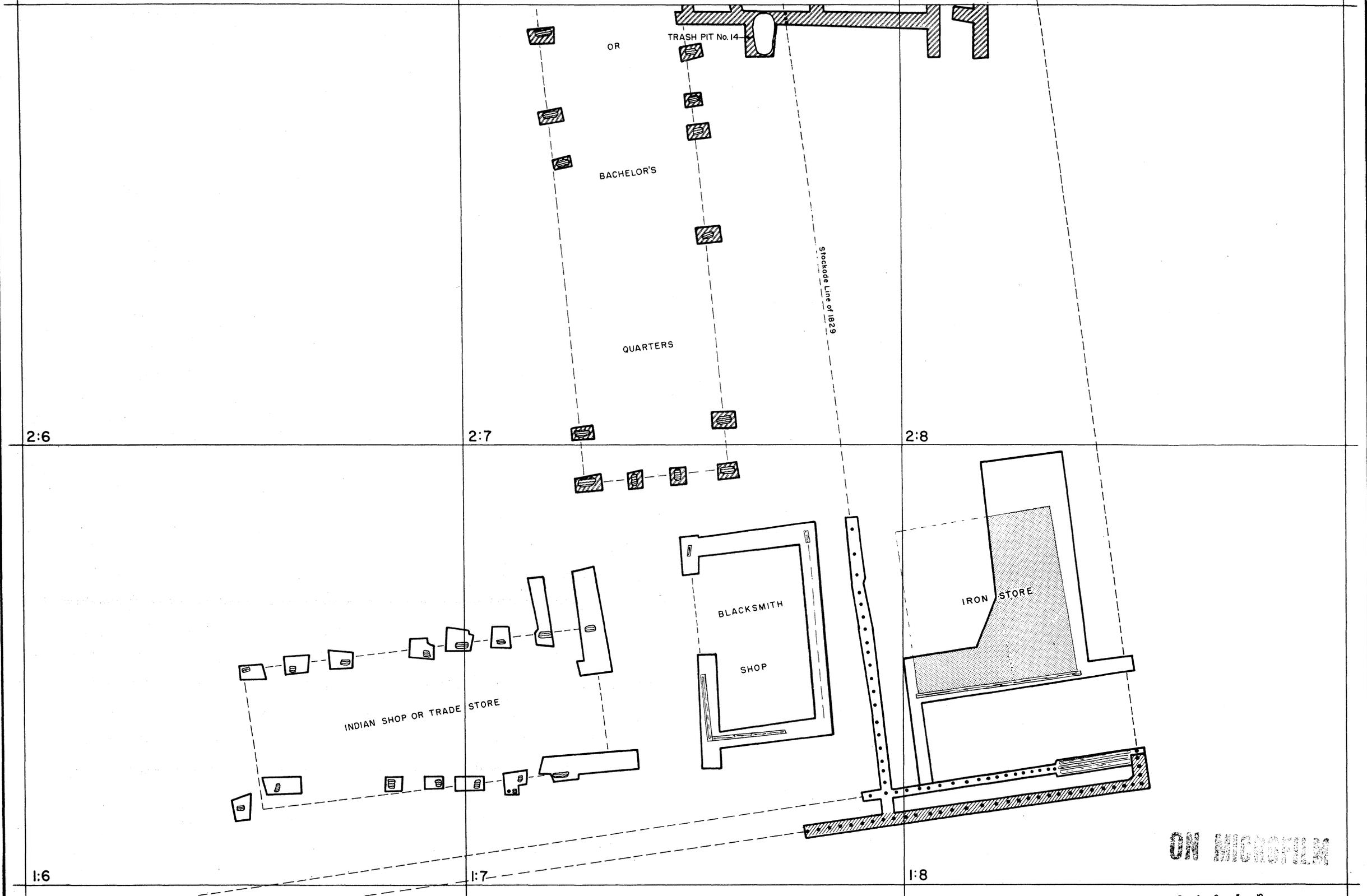
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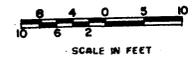
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ON MICROFILM

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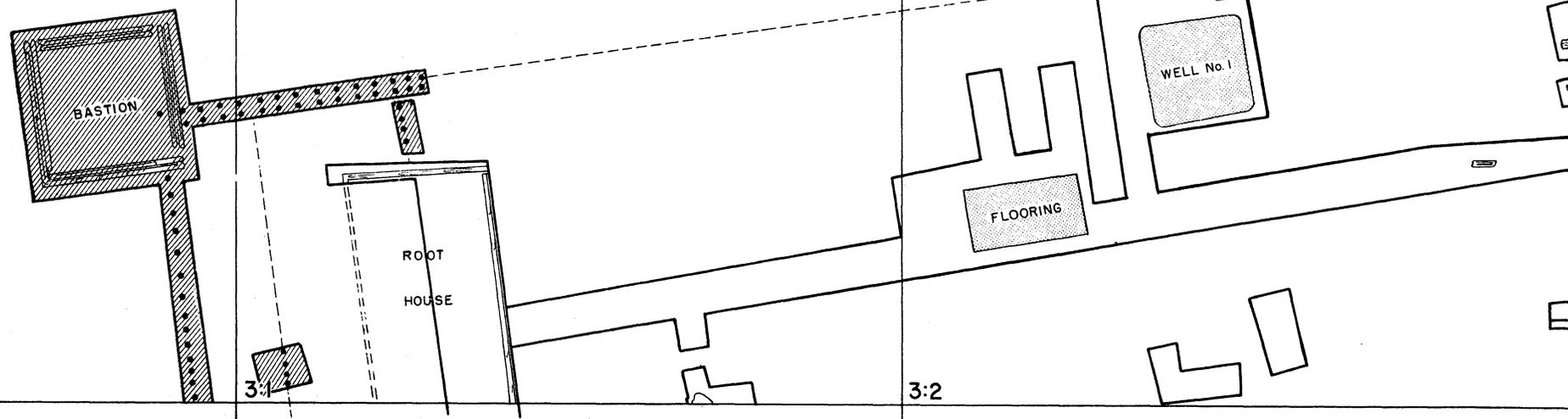
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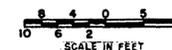


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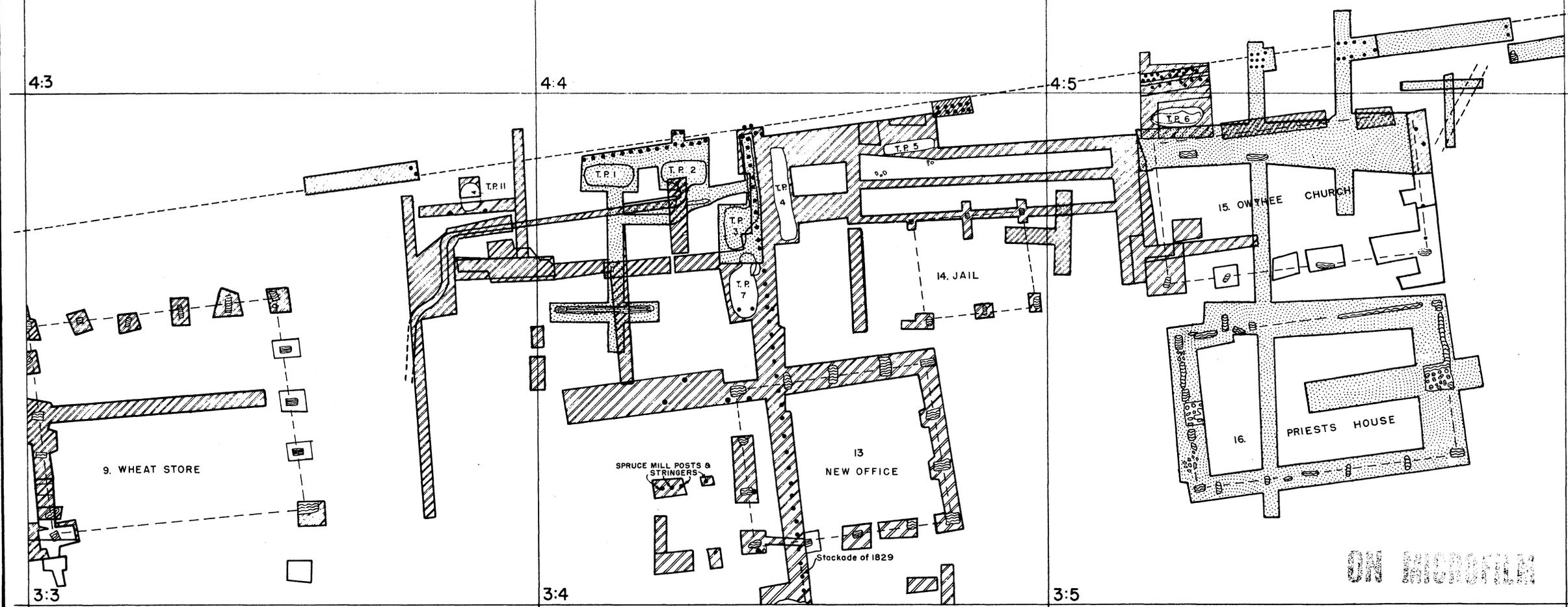
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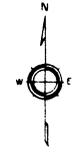
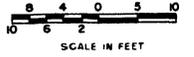


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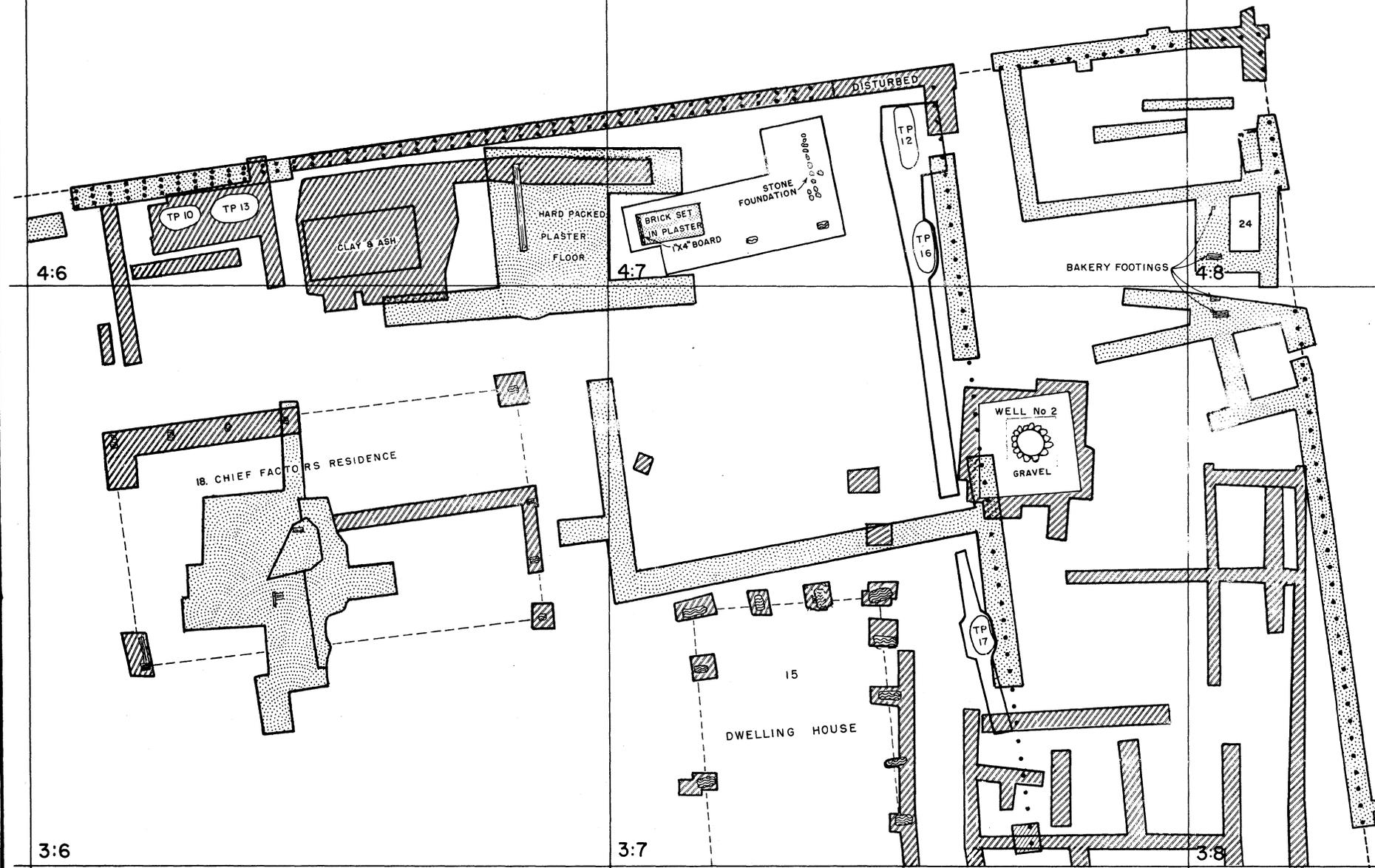
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ARCHEOLOGICAL EXCAVATIONS
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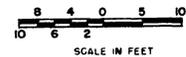
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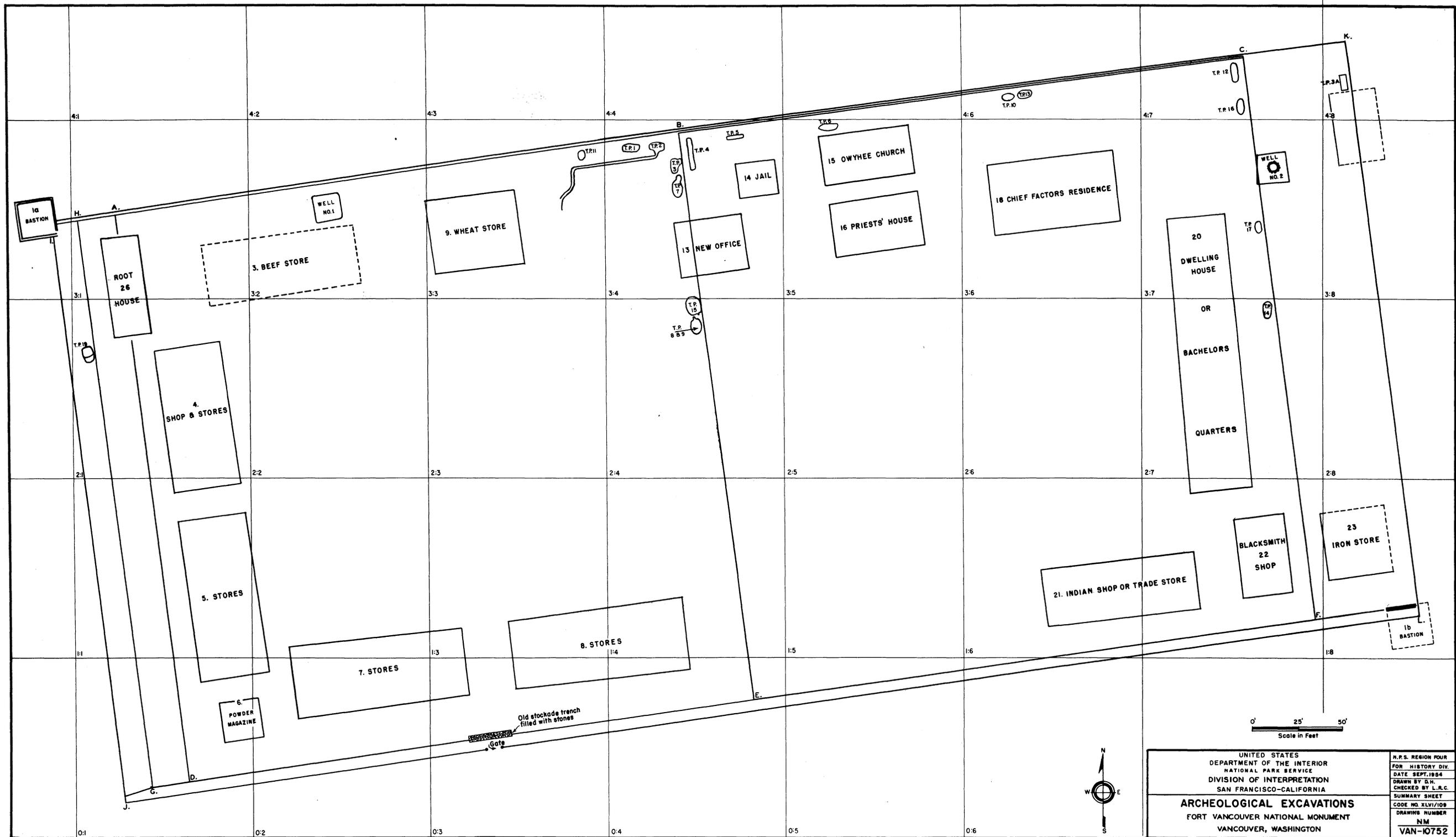


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ARCHEOLOGICAL EXCAVATIONS
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ON MICROFILM



UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE DIVISION OF INTERPRETATION SAN FRANCISCO-CALIFORNIA	N.P.S. REGION FOUR FOR HISTORY DIV.
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