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The Bulletin

Journal of the New York State Archaeological Association



Combined hammerstone/muller and mortar from the Goes/Van Derzee Farm site

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Onondaga Longhouses in the Late Seventeenth Century on the Weston Site

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In the summer of 1696, Count Frontenac, Governor of New France, led a punitive expedition against the Onondaga. After the event his cartographer prepared a map and a description of the invasion route, including a detailed drawing of the Onondaga capital. Excavations for ten seasons on the Weston Site have yielded sufficient settlement pattern data to conclude that it was Frontenac's objective. Three complete longhouses and portions of seven other houses were exposed. A singular- architectural modification on two structures was documented, indicating one unit which served the community as a storehouse and the other as a domicile and village storehouse. The results of the historic documentation, excavation, and analysis are presented.

Introduction

The Weston Site is located seven miles southeast of the city of Syracuse, New York, on the central eastern half of Lot 5 in the town of Pompey. The village site covers an area of approximately 9 acres, of which about 6.5 acres were enclosed by a fortification. The author has conducted archaeological investigations at the site over a ten-year period, excavating 0.5 acres, or a little more than 5 percent of the village site. The excavations exposed remains of two complete houses, an entire storehouse, two nearly complete houses, parts of five other houses, a complete bastion, and sections from the north, west, and south palisade walls (Figure 1). These settlement data form the basis for comparisons with a French map of 1696 directed at answering the question of whether the Weston Site was the locus of the Onondaga capital intended for attack by General Count Frontenac in 1696.

Historical Background

During the seventeenth century, the relationship between the French and Iroquois was characterized by periods of inconclusive warfare followed by periods of uncertain peace. The last decade of that century was marked by a return to hostility. In 1695 Governor-General Frontenac's solution to Iroquois incursions into New France was to restore Fort Frontenac, and from there supply and encourage Canadian Indians to lead war parties into the Iroquois homeland. The desired result was to keep the Iroquois warriors in their own territories defending their people and towns (Charlevoix 1897:IV:261). The plan was so effective that it was the first item on the agenda at the

Board of Trade meeting in Whitehall on August 26, 1696. It was recorded in the minutes as follows:

Mr. Chidley Brook and Mr. William Nicoll, attending acquainted the Board that the French of Canada had the last summer possessed themselves of a Fort at a place called Cadaraqui, which tho at 4 or 500 miles distance from New Albany is an annoyance to them, and the Indians of the Five Nations their Neighbors.... That the way of those Indians is thus, to hide themselves in Woods and Bushes and as soon as they have done any mischief fly into the Woods, - where it is impossible to follow and find them [O'Callaghan 1853-1887:IV:181].

Despite the positive results of his plan, Frontenac was being pressured by everyone from King Louis XIV to his Indian allies to do something more decisive. To explain Frontenac's actions, Charlevoix in his *History and General Description of New France* quotes a 1695 letter from Frontenac to Pontchartrain:

Some wished me to go this year with all our regulars, provincials, and allies, drums beating, and carry Onondaga. I did not deem it expedient: 1st. because I had not sufficient force to do it; 2ndly, not to leave the country stripped, exposed to the incursions of the English, who might pounce upon Montreal, by way of Chambly; 3rdly, from the uselessness of an enterprise which would result merely in burning cabins; for if the Indians had no time to call in the English, they would infallibly retire to the woods with their families. The example of what occurred after de Denonville's expedition against the Seneca, justifies sufficiently all I say and shows us that the destruction of an Iroquois village is not the way to deliver us from their incursions [Charlevoix 1897:IV:267-268].

During the winter of 1695-1696, Frontenac decided a decisive action by French forces against the Iroquois was necessary. The results of the expedition in the summer of 1696 were as Frontenac had predicted: the Onondaga burned their

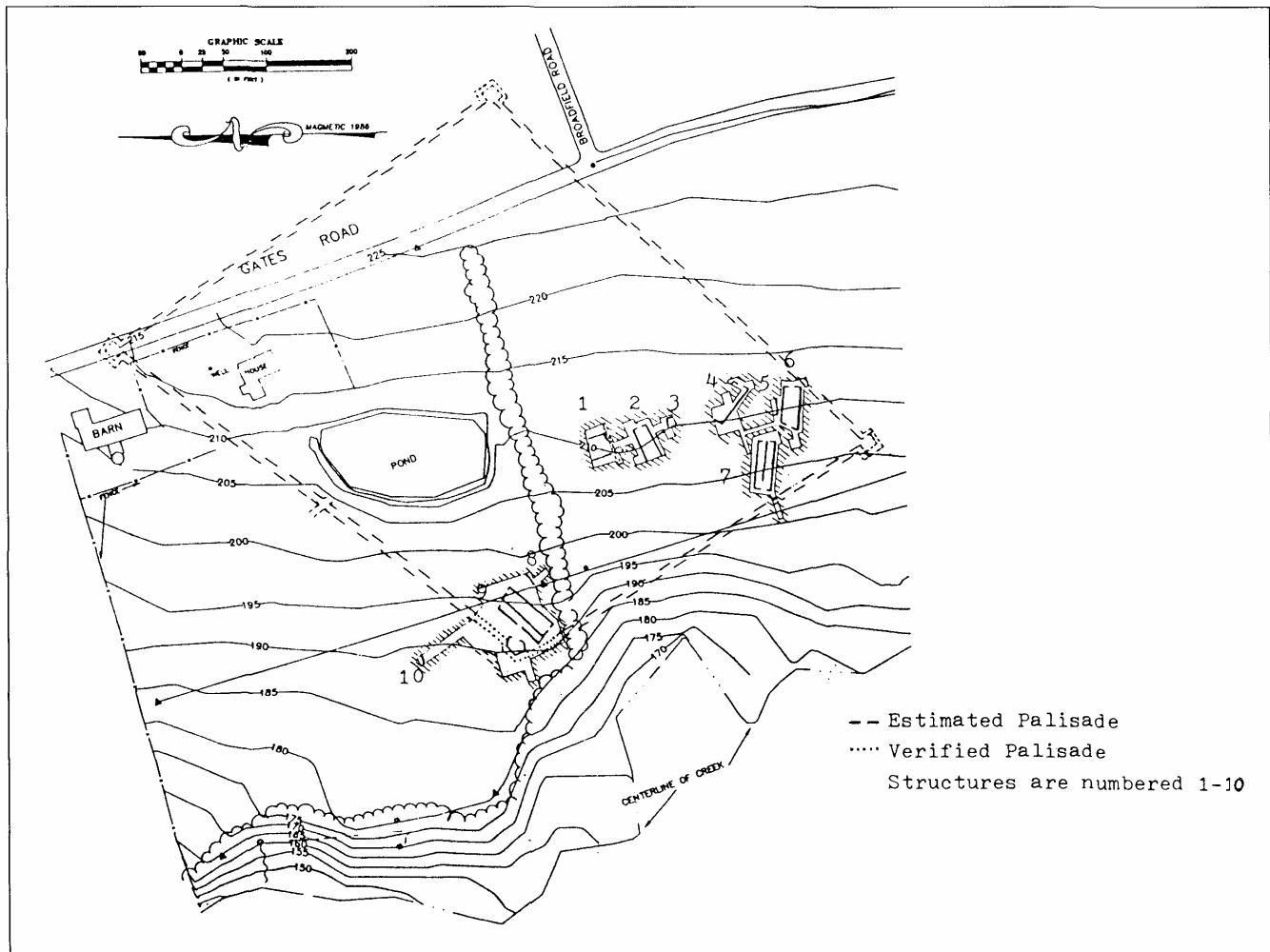


Figure 1. Map of excavations at the Weston Site, showing the floor outlines of 10 structures, the northwest bastion, and the probable limits of the fort.

town and retreated into the forest, the Oneida town was similarly ruined, and all the crops in both villages were destroyed. While the property losses for both nations were extensive, they were quickly restored. English allies in Albany gave the refugees shelter, corn, and supplies (O'Callaghan 1850:I:342). The French invasion also did not end Iroquois incursions into New France. A lasting peace treaty between the Iroquois and the French was not signed until 1701.

After returning to New France, Frontenac reported the events and results to his superiors in Paris. Apparently, a very detailed but undated and anonymous color map also accompanied the written account (Figure 2). The absence of date and signature does not diminish the map's value, since many seventeenth-century maps are not signed or dated (Heidenreich 1978:101). Because the map demonstrates fine cartographic craftsmanship, Heidenreich attributes it to Levasseur, the expedition's engineer, or another person of his caliber (Heidenreich 1978:100). This color map is the property of the French Ministry of Defense and is curated in the library at the Chateau de Vincennes in Album 67 as Manuscript 91 (Heidenreich 1978). It illustrates the route followed by the invaders and the surrounding countryside from Lake Ontario, where Oswego, New York is today at the mouth of the Oswego River, to the Onondaga village in the Pompey hills area southeast of Syracuse. It also has scale insert plans of the Onondaga village and Frontenac's temporary fort for housing his bateaux, canoes, and supplies at the south end of Onondaga Lake. What follows is a comparison between this manuscript map, and especially the village site plan, and settlement data resulting from ten years of excavations at the Weston Site. They appear to confirm that it is the location of the Onondaga town attacked by Frontenac in 1696.

Site Description

Physiographically, the Weston Site is on the glaciated northern foothills of the Allegheny Plateau, 1120 ft above sea level, and 2 1/2 mi south of the Helderberg-Onondaga Escarpment. The escarpment, an enormous east-west outcropping of moderately pure light blue-gray Onondaga Limestone with some chert lenses, is the northern border of the Allegheny Plateau and the southern border of the Erie-Ontario Plain which extends north to Lake Ontario. Above the thick limestone is a narrow layer of soft black shale (Hutton and Erwin 1977). The soil mantle of the upland area surrounding the

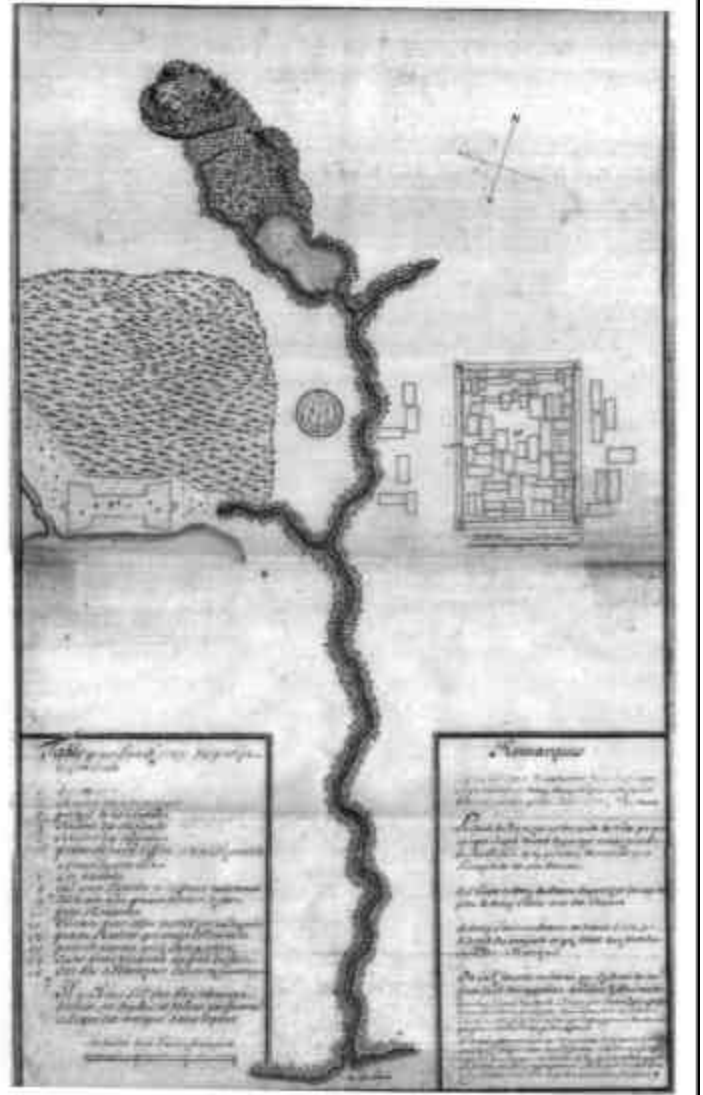


Figure 2. French map, c. A.D. 1696, of the invasion route into the Onondaga territory from the mouth of the Oswego River at Lake Ontario (bottom) to the Onondaga village (top), including, two detailed insert drawings: the fortified temporary French encampment on the shore of Onondaga Lake (center left) and the Onondaga village (center right).

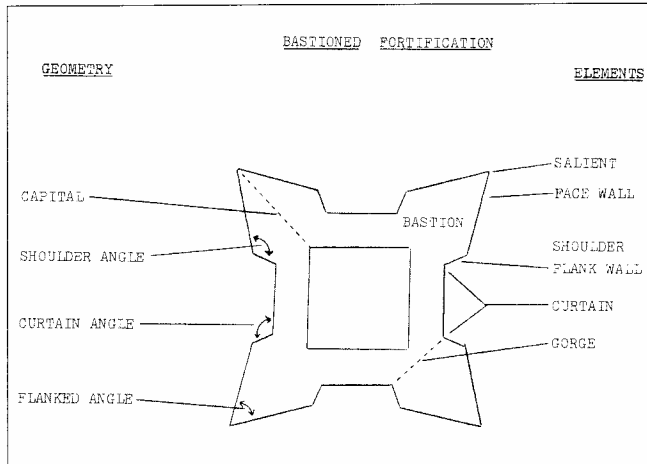


Figure 3. Schematic illustration of a seventeenth century European style fortification with bastions (after Robinson 1977).

Weston Site is mostly Honeoye and Lima silt loams. These soils are derived mainly from the limestone and shale in the escarpment and from smaller quantities of sandstone, red and green silty shales, and crystalline rock.

The site is positioned in the center of a long north-south oriented stream terrace which slopes 2.5° westward toward a ridge which rises 80 ft above the site. The western edge of the terrace falls sharply 25 ft to a small low-yield tributary of Butternut Creek. Just beyond the northwest corner of the village and 15 ft down the stream bank is a large spring from which water flows continuously year round. Undoubtedly, this spring was the village water supply, since the stream frequently stops flowing during dry summers, leaving only shallow pools. The stream originates inconspicuously in the higher ridges 3/4 mi to the south, flows rapidly north out of the hills and onto an ancient glacial alluvial plain 1 mi north of the site, turns west and meanders for 1 1/2 mi across this flatland composed largely of Herkimer silt loam before cascading into Butternut Creek. East of the terrace is another north-south ridge which is 60 ft above the village site. North of the terrace the upland first declines gently and then drops precipitously 300 ft to the flatland above the escarpment.

The topsoil matrix in the village area is Honeoye loam with large quantities of rock materials, ranging in size from fine powder to large boulders. Most of the rock material and all of the boulders are limestone. Shales are present only as rock flour, coarse gravel, and small stones due to the very fissile nature of shale. The subsoil is a very irregular blend of clay, sand, and rock. In general, the lower terrace levels on the west side of the village have a higher sand content than the central section where the clay and rock elements predominate. Boulders are more

numerous in the higher levels of the terrace. Throughout the site there are random, localized deposits of mostly clay, sand or gravel. Postmolds in the sand and clay soils were very obvious, but in the high gravel soils they were exceedingly difficult to locate. Varying concentrations of black shale added to the difficulty of postmold identification by darkening the color of the soil matrix to a shade similar to that of the post molds. As a result, some of the structures identified (Structure 7, House 9, and the bastion) could be well defined because they are mainly on sandy-clay soils with low gravel concentration, no boulders, and a light matrix color. Structures 2 and 3 could not be completely defined due to areas of high gravel concentration. Structure 6 was only partly discerned because of a large number of boulders in the subsoil.

Archaeological Methods

A large portion of the eastern half of the village site was lost to farm and road construction in the nineteenth and early twentieth centuries. The north half of the remainder of the site had been cultivated annually for many years in earlier times, but for about the last 45 years it has been in pasture, while the southern half had been plowed annually since the early nineteenth century but left dormant for only the last 13 years.

The limits of the undamaged portion of the village were established by examining the terrace and the stream bank for artifacts and color changes in the topsoil. The boundary in the pasture was estimated by shovel testing at 50 ft intervals, and in the plowed field by surface examination of the tilled and rain-washed soil in spring. The stream bank was shovel tested where it was deemed appropriate. Using this method, the northern, western, and southern boundaries could be determined accurately, but the eastern boundary had to be estimated.

Excavations were divided into three sections. In the first section, which contained Structures 1, 2, and 3, and in the third section, which contained Structures 8, 9, 10, the bastion, and the palisade, the topsoil (except for the lower 4 in) was removed with a bulldozer. The remaining topsoil was removed carefully with shovel and trowel. In the second section, which exposed Structures 4, 5, 6, and 7, all the topsoil was removed by shovel and trowel. Each square had to be backfilled and graded the same day. No machinery was permitted on this section of the site. In all three sections, when middens and other areas with significant concentrations of artifacts were encountered, the topsoil was sifted through 1/4 in and 1/8 in mesh screens. Samples were also saved for flotation.

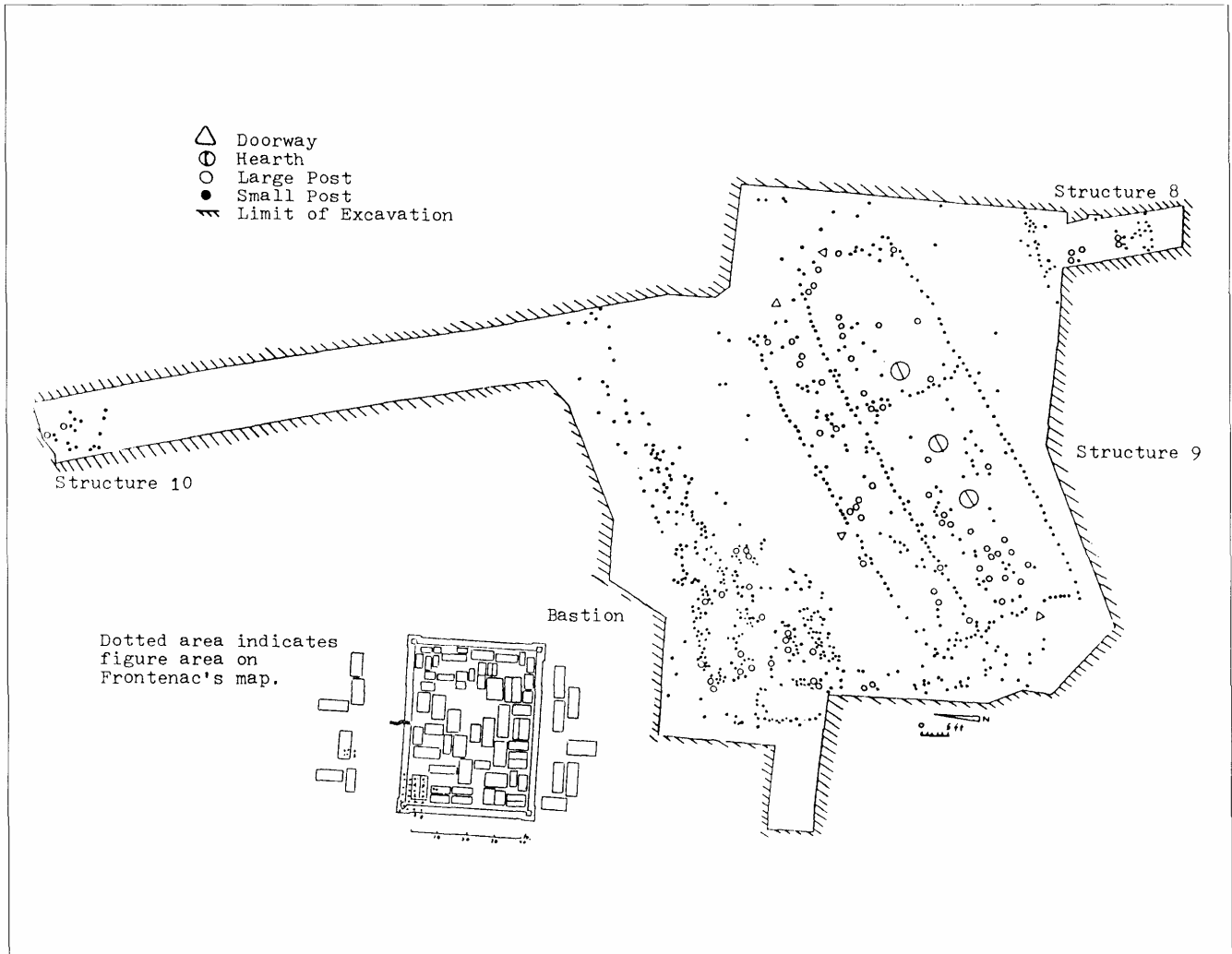


Figure 4. Weston Site: North locus site map.

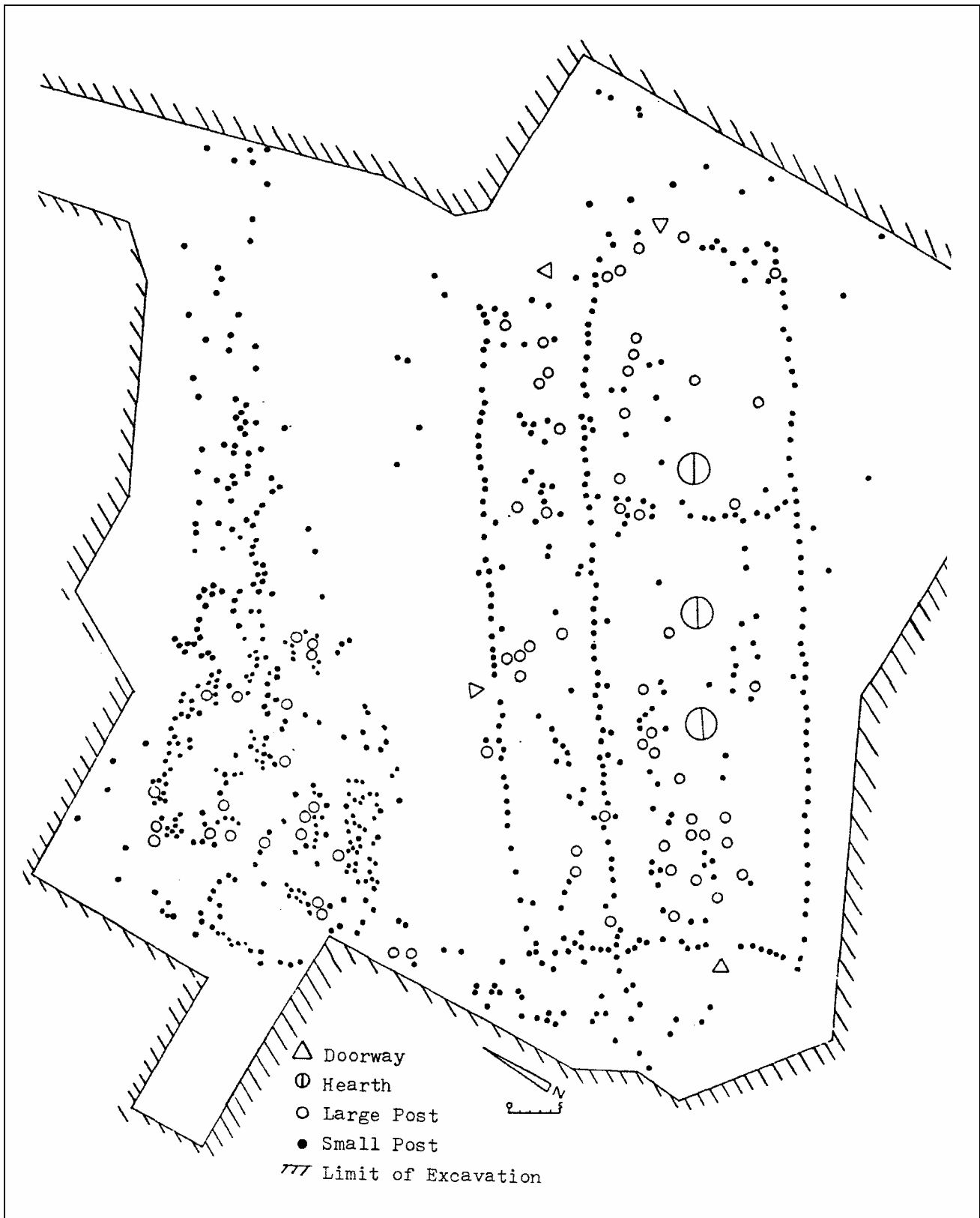


Figure 5. Map of the post mold pattern of Structure 9, the northwest bastion and the triple-walled fort.

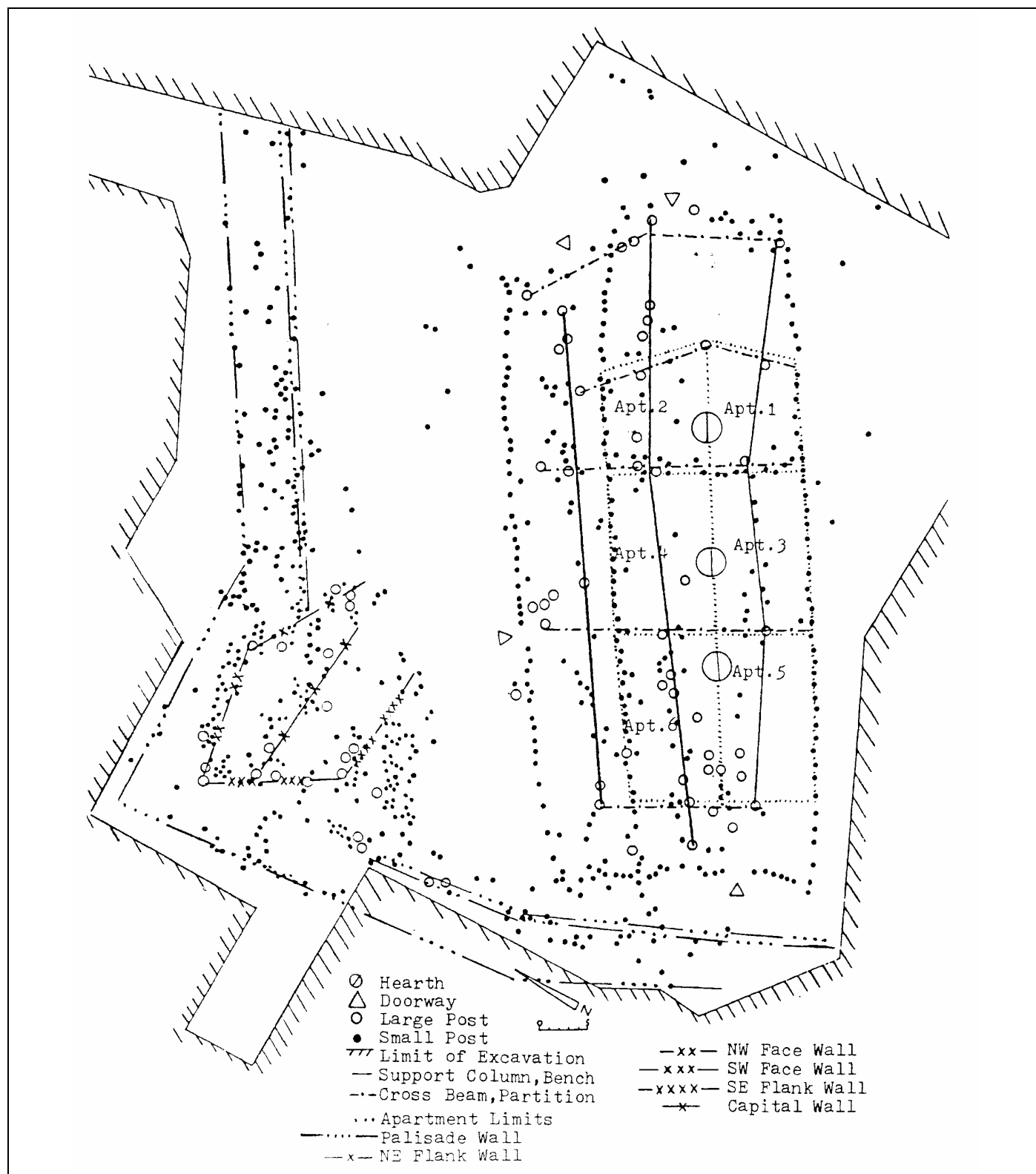


Figure 6. Map illustrating the architectural features of Structure 9, the northwest bastion, and the triple-walled fort.

Results of the Excavations

Bastion and Palisade

Frontenac's map depicts a rectangular fort consisting of a triple-walled palisade and four corner bastions enclosing most of the town. It had only one entrance in the center of the north wall. The northwest bastion and a 50 ft section of the palisade

The bastion identified at the Weston Site is an irregular pentagon-shaped structure jutting from the northwest corner of the palisade (Figures 4, 5, and 6). It encompasses an area of approximately 400 sq ft. At least 20 large posts and 175 small posts went into the construction of the vertical framework. The northeast flank wall, 17.5 ft long, contains 6 large posts, and 25 small posts; the northwest face wall is 15 ft long and has 4 large posts and 31 small posts; the southwest face

Table 1. Bastion: wall measurements

	Northeast Flank Wall	Northwest Face Wall	Southwest Face Wall	Southeast Flank Wall	Gorge (East) Wall	Capital (Central) Wall
Length	17.5'	15'	20'	15'	10'	15'
Total Number of Posts	31	35	39	49	5	36
No. Large Posts	6	4	4	3	0	3
Avg. Diameter	6.2"	7.6"	8.8"	9.3"		8.3"
Diameter Range	5"-8"	5.5"-10"	7"-12"	8"-12"		8"-9"
Avg. Depth	12.8"	7.4"	11.8"	11"		11.7"
Depth Range	9"-18"	2"-12"	9"-21"	7"-18"		6"-18"
No. Small Posts	25	31	35	46	5	33
Avg. Diameter	3"	3"	3.2"	3.1"	2.8"	3.3"
Diameter Range	3"-4"	2.5"-3.5"	2"-4.5"	2"-4.5"	2.5"-3"	3"-4.5"
Avg. Depth	6"	6.7"	5.6"	7.5"	4.4"	6"
Depth Range	4"-6"	1"-14"	2"-10"	2"-13"	2"-6"	1"-13"

Table 2. Geometry of the NW Bastion

Flanked Angle	80°
NE Shoulder Angle	130°
NE Curtain Angle	125°
SW Shoulder Angle	130°
SW Curtain Angle	130°

on each side were uncovered. A bastion is an outward extension of a fortification wall which permits the defenders to enfilade the ground in front of adjacent curtain walls (Figure 3). It has two walls called faces and two walls called flanks. The face walls are the walls which form the salient or the outward projection of the bastion. The flank walls are the walls connecting the face walls to the curtains. The curtain is the part of a bastioned fort that connects two neighboring bastions. The corner formed by the joining of the face and flank walls is called the shoulder of the bastion. The gorge is the entrance to the bastion. The capital of the bastion is a line extending from the salient of the bastion, bisecting the bastion (Robinson 1977).

wall is 20 ft long and has 4 large posts and 35 small posts; the southeast flank wall is 15 ft long and has 3 large posts and 46 small posts; and the gorge (east) wall is 10 ft long and consists of 5 small posts. The gorge wall which faces the village was probably left open and the 5 posts most likely functioned as ladders for mounting the platform and secondarily as platform supports. A 15 ft long capital (center) wall extends from the southwest face wall near its apex with the northwest face wall to the middle of the gorge wall and divides the bastion into two nearly equal sections. The capital (center) wall has 3 large posts and 33 small posts (Tables 1 and 2). The large and small posts forming the bastion are identical to the poles used for building the houses and other structures. The average diameters of the large and small posts are 8 in and 3 in, respectively.

The bastion had a European-style frame construction which placed the weight-bearing superstructure in the outer walls rather than the typical Iroquoian construction style, which is characterized by an internal superstructure separate from non weight-bearing outer walls. At regular intervals in each bastion wall and at each corner are large posts except at the corners of the southeast flank and gorge walls. Here, there is a cluster of three small posts which ~probably functioned as

one large post (Kapches 1993:145-146). In the bastion the large posts provided support for the observation platform and the small posts functioned as a barrier to invaders.

Since the building material in the bastion was the same as that used in longhouse construction, the bastion platform was likely erected to the same vertical architectural limit of 20 ft to 25 ft. Most contact period palisades were usually 15 ft - 20 ft in height (Heidenreich 1971:140). The straight palisade walls, the forward position of the bastion, and a platform height of at least an additional 5 ft above the wall would provide a clear view in all directions for an observer. The 400 sq ft platform could also accommodate a large number of well-armed defenders.

As previously noted, a 50 ft section from the west palisade and another from the north palisade, both in the northwest corner of the fort, were exposed. In addition, a 5 ft section from the south palisade and another 5 ft section of west palisade, both near the southwest corner of the fort were excavated. The palisade has three straight parallel walls. The two inner walls are set close together, ranging between 5 in and 12 in apart. All the posts were pointed and most were set vertically into the soil. Some posts, however, angled slightly toward companion posts in the other wall. The third wall is roughly 6 ft from the two inner walls. All the posts in the third wall had pointed tips and were vertically set. The diameters of the post molds in the three walls are the same, ranging between 2.5 in and 4.5 in, with an average of 3.5 in. Post depth into the subsoil ranges from 3 in to 14 in. The average depth is 8 in into the subsoil. In the sections of palisade which crossed soil ideal for post mold identification, the pole spacing is 7 poles/5 ft for the outer wall and 8 poles/5 ft for each of the inner walls. The width of the fort in the western half of the village is 475 ft. Using Frontenac's map as a guide, the east-west length would be approximately 617 ft. To construct the palisade with four bastions, then would require nearly 10,000 poles.

The two inner walls of the north and west palisade are attached to the bastion. The north palisade connects to the middle of the northwest bastion wall and the west palisade contacts the corner formed by the southwest and southeast bastion walls. The outer wall of the palisade maintains a distance of 6 ft from the bastion. The north and west outer palisade walls join, forming an angle of approximately 110°, six feet out from the jutting bastion point. At random intervals between the outer wall and two inner walls are short connector walls. These walls in conjunction with the three parallel walls form cul de sacs which would restrict the movement of invaders able to penetrate the outer wall.

Table 3. Apartment Measurements in House 9

Apartment Number	Length (feet)	Area (sq. feet)	Bench Width (feet)
1	11	110	3
2	10	100	5
3	16.2	162	5
4	17.5	175	6
5	13	130	5
6	12.5	125	5

Other Structures

General Construction Techniques

All the structures within the palisade were built in the traditional Iroquoian construction style. The roof weight was supported by an internal superstructure of large poles arranged as bench and partition posts and central support posts. The outer walls were non-weight bearing and constructed with small poles. This design increased the longevity of the structure and permitted easier maintenance. Dry rot, the decaying of wood by prolonged exposure to fungi and moisture, is the most destructive factor in wood frame construction. The most vulnerable area on a vertically set pole is at the ground level where the pole enters the topsoil. Here is where the fungi, moisture, and oxygen, the necessary components for dry rot, are at their optimum. By placing the weight-bearing poles in the dry interior of the structure, exposure to moisture is eliminated or greatly reduced, thus preventing or minimizing dry rot. The outer wall poles, which are subject to this decay can be easily replaced, when necessary since they do not support the roof. Dry rot does not proceed uniformly around all poles, since the rate of destruction is determined by local factors around each pole. Therefore, it was possible to replace only the weakened poles without disturbing the integrity of the rest of the structure.

Some structures were architecturally modified to produce nonresidential, special-purpose structures or to provide space for a unique room, with a special function, on a traditional longhouse. For example, the internal floor plan of Structure 7 had been modified to produce a storehouse, while the super-structure support of House 9 was designed to accommodate a large storeroom along a long wall. The variety of floor patterns shows the architectural flexibility afforded by the Iroquoian construction style and the willingness of the Onondaga to design structures to satisfy special needs.

Despite the design variations at the Weston Site, there are some features common to all structures. The widths of the buildings range between 20 ft and 30 ft, well within the traditional longhouse design limits. All end walls are flat and join

the side walls to form square corners. The homes have storage vestibules of irregular widths. Bench lines are along the side walls. Large support posts are in the bench lines and occasionally in the side walls. The end walls and side walls are straight lines of single posts 3 in to 4 in in diameter and spaced roughly 5.8 posts/5 ft of wall length, except House 5 which has a clear zigzag pattern. There are no storage pits in the houses or storehouse. Apparently all storage was above ground.

Structure 9

This house, which has a singular floor plan, corresponds to that dotted in on Frontenac's map inset as shown in Figures 4, 5 and 6. Essentially, it is a traditional long house with a special room attached to the long west wall and extending almost the entire length. This room, probably designed for community or clan use, occupies one third of the structure. The remaining two thirds is a domicile. The residential section is 70 ft long and 20 ft wide. The 4 ft entranceway on the 18.6 ft long north wall and the 2 ft entranceway on the 18.8 ft long south wall are slightly off-center. At the north end, the storage vestibule is approximately 13 ft long and 18 ft wide and the storage vestibule at the south end is 11.2 ft long and 19.5 ft wide, providing 234 square feet and 219 square feet of storage, respectively. The high density of large and small posts in the vestibule at the south end indicates it may have had a function other than storage.

The remainder of the house is subdivided by partitions into six apartments. Each apartment has a bed platform extending the full length. The sleeping platforms are all 5 ft wide except in apartments 1 and 4 where they are 3 ft and 6 ft, respectively (Table 3). The well-delineated partition walls, constructed with large and small poles, divide the six apartments into three sections. The small posts of the partition walls are slightly smaller in diameter than the outer wall posts but are in closer alignment. The large posts function as wall partition components and as major roof supports. By placing the large post in the partition walls, the architect is wisely economizing on apace. The doorway through the partition separating apartments 1 and 2 from apartments 3 and 4 is 3.3 ft wide, while the doorway through the partition separating apartments 3 and 4 from 5 and 6 is 4.5 ft wide. Due to adverse soil conditions, the first partition at the north end of the house is indistinct. The partition separating apartments 5 and 6 from the vestibule at the south end is difficult to define because of the plethora of post molds.

There are three evenly spaced and centrally located hearths. Each is 10 ft from the closest outer wall. The hearths have a very distinct round or oval shape and are shallow, extending only 1 in to 2 in into the subsoil. The soil under the hearths is fire-reddened. Each hearth is filled with about an inch layer of white ash and covered by a thin layer of

charcoal. The hearth shared by the inhabitants of apartments 1 and 2 is round with a 2 ft diameter and is 14.3 ft from the hearth between apartments 3 and 4. This second hearth is oval and measures 2 ft 3 in by 2 ft 1 in. It is 11 ft 8 in from the third hearth, which is between apartments 5 and 6. The final hearth is also oval and measures 2 ft 4 in by 2 ft.

The long storeroom, which shares a wall with the living quarters, is 63 ft 9 in long and 10 ft wide and provides 637 square feet of floor space for storage. Five-foot sections of post molds along the long west wall of the storage area were randomly selected and bisected. The results indicate that all 46 poles used in the construction of the west wall were vertically oriented. These poles had the same average diameter and depth into the subsoil as the posts in the other long walls of the house. This suggests the storage room reached the same height as the living quarters. Additional evidence is provided by the widely spaced irregular line of 6 posts which are located outside of the house and run parallel to the outer long wall at the north end of the house. All six were bisected. Four are vertically oriented and two are angled toward the wall. If the two angled poles contacted the wall, they would have touched at 17.9 ft and 11.4 ft above the height of the subsoil. The other 4 posts also undoubtedly provided external support for the longhouse. They likely served as abutments for pole buttresses which were not sunk into the subsoil.

A 2.5 ft wide entrance could be discerned near the middle of the west wall. Another entrance, measuring 3 ft 3 in wide, is on the north wall. Interestingly, there is no doorway through the common wall separating the living quarter, and the storeroom. This implies the storage area was designed to be accessible to other people. It was probably for clan or tribal use. Supporting this conclusion are the vestibules at the north and south ends of the living quarters. With the traditional allotment of storage space provided by the vestibules, there would be no need for an additional room except to serve the greater community.

Seventeen of the 53 post molds which delineated the long east wall of the storeroom (common inner wall) were bisected. All the post molds had the same average diameter and depth as the post molds in the other long walls but distinctly different orientation. Instead of a perpendicular profile, the post molds slanted east about 8° to 12° from vertical, averaging 10°. This means the wall between the apartments and the storeroom tilted slightly into the living area and probably attached to the central support column at the level of the rafters. Since the wall was 5 ft from the central column at the ground level, it must have contacted the column at a height of 28.4 ft. This wall design has two obvious advantages. First, it simplifies the attachment of the upper end of the inner wall and the rafter design. If it did not connect to the central column rafters, a separate system of cross beams would have

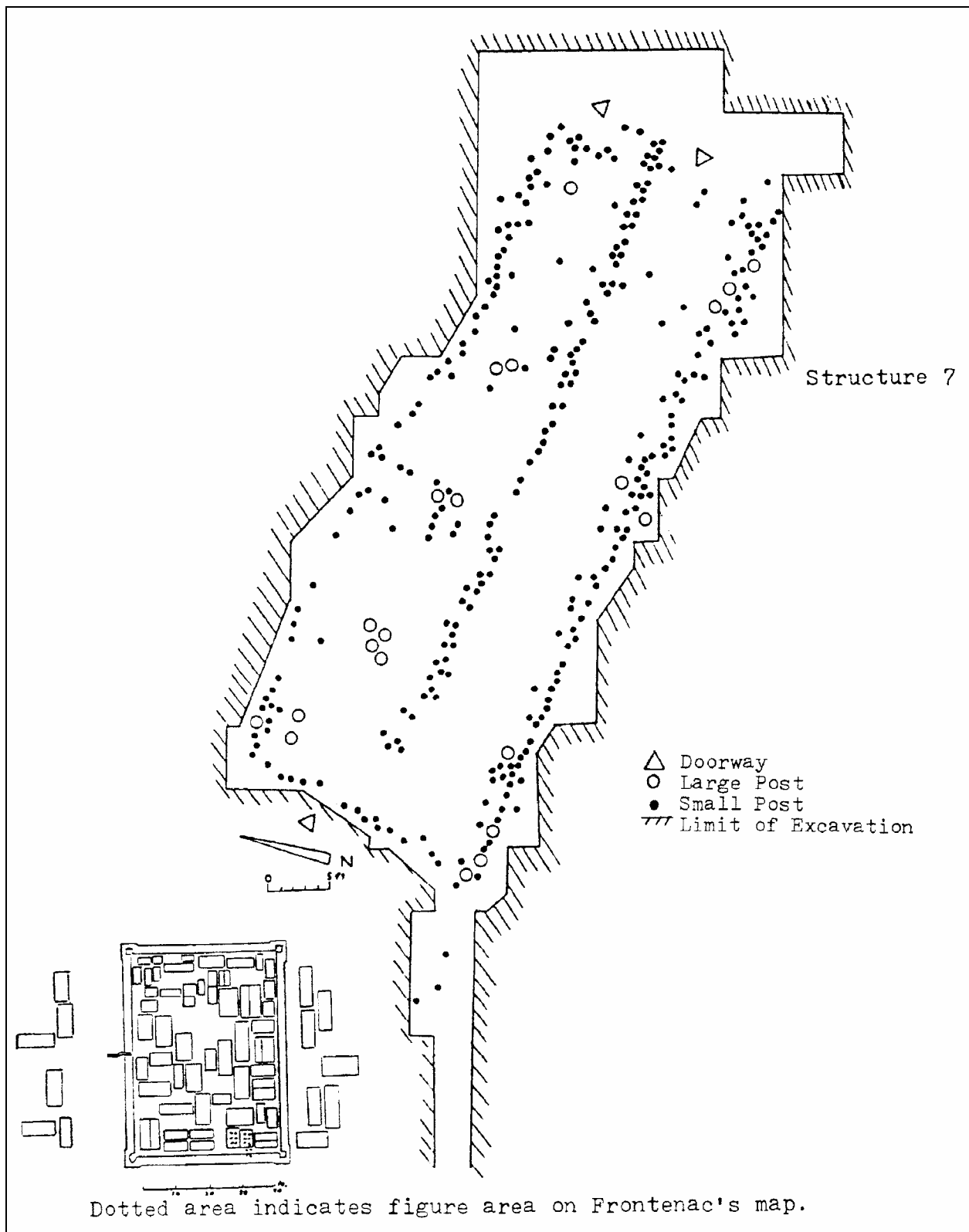


Figure 7. Portion of excavated area showing floor pattern of Structure 7.

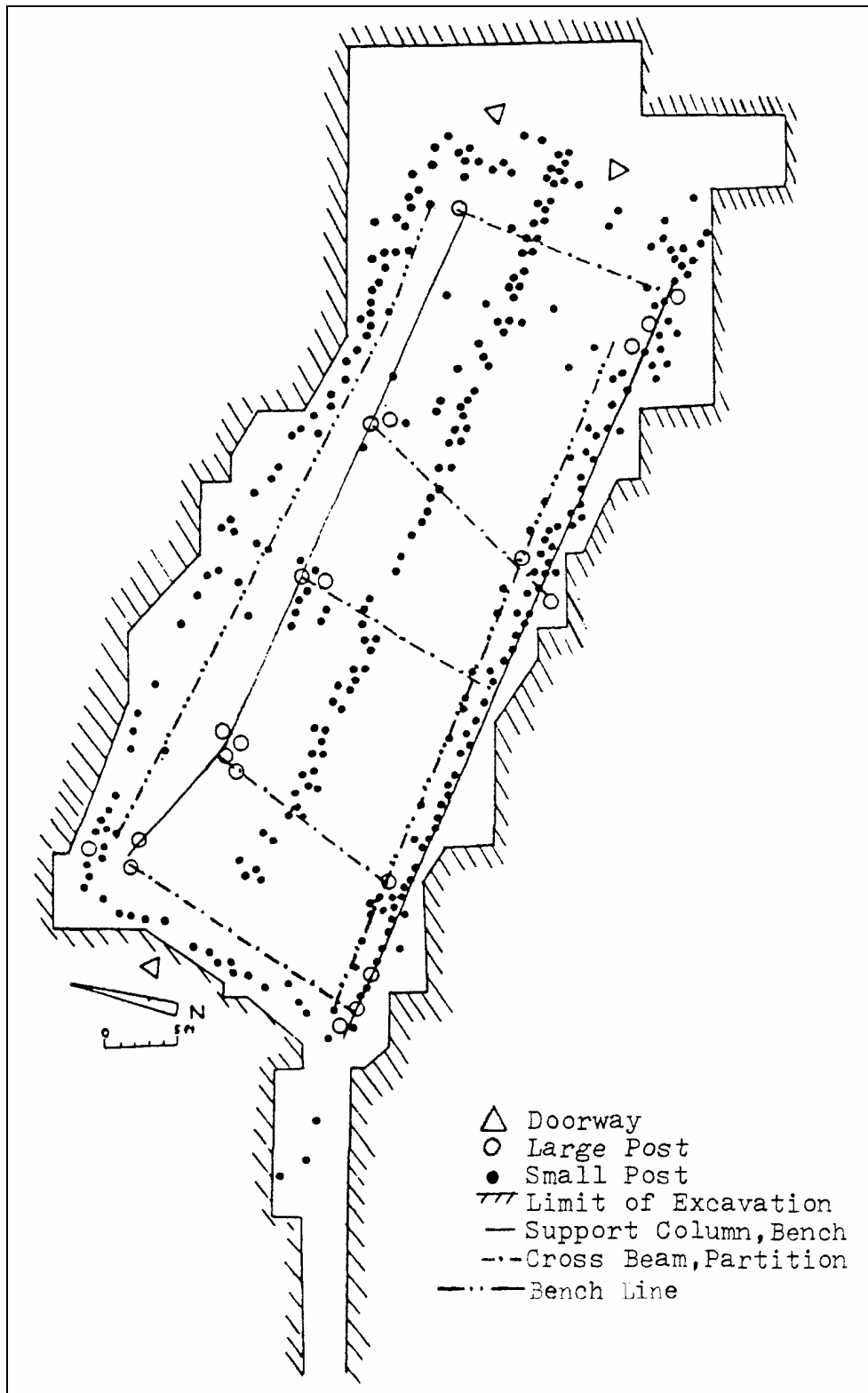


Figure 8. Map of Structure 7 illustrating the architectural features.

been required to attach the wall to the rafters. Additionally, the inner wall functions as a buttress for the central columns. Second, the slanted wall design increases the storage space. For reasons cited earlier, the vertical storage space throughout the storeroom probably extended to the height of the rafters. The slanted wall, then, increased the vertical storage capacity by about 25 percent. This also provided additional living space at the ground level for the occupants on the other side of the wall.

Four feet from the east wall there is a bench line which extends the full length of the storeroom. It was built with large and small poles and here, as in the living quarters, the long posts were also part of the superstructure. No bench line along the west wall can be ascertained. Irregular scatters of posts occur throughout the 6 ft wide corridor. Their function is not clear but they may represent drying racks, support racks for suspending stored goods, or ladders for accessing the upper levels of the storeroom. Sagard observed methods of storage employed by the Huron. He noted that corn was:

.. hung in rows, the whole length of the lodge from top to bottom on poles which they put up as a sort of rack, coming down as low as to the edge of the roof in front of the bench [Sagard 1939:104].

The Onondaga likely used this technique, as well as placing small but bulky goods such as beans and shelled corn in bark barrels and storing them on shelves (Parker 1910:34). Storage pits apparently were not used at the Weston Site. None were observed in any structure. Interestingly, Snow (1995:435) noted a dearth of storage pits at the contemporary Mohawk town of Caughnawaga. He attributed this absence of pits to the loose consistency of the sandy soil. The nature of the subsoil is likely the reason for the lack of storage pits at the Weston Site. Here, the subsoil has a heavy clay matrix. The bedrock is also close to the surface as evidenced by a large shale outcropping at the higher eastern end of the terrace. Spring runoff and ground water is forced close to the surface by the bedrock. As a result, any storage pit would act as a catch basin and all the contents would be lost. Evidence of the water retaining quality of the subsoil is a modern man-made pond where the north central section of the village once stood. It is fed by spring runoff and around water only, but holds enough water year round to be a habitat for fish. Additionally, one wet spring day, the author and a small crew started removing the topsoil from several 5 ft squares. To our astonishment as soon as the topsoil was removed, water started to percolate up through the subsoil and seep through the side walls. In twenty minutes the 1 ft deep, 5 ft squares were half full of muddy water.

A study of the superstructure of House 9 reveals that it was pre-planned as a single unit and not a preexisting traditional longhouse with lateral expansion. The 30 ft wide and 70 ft long structure was supported by three equally spaced columns of large poles extending the length of the building. Each column was also a bench line. The central column was 5 ft from the inner wall, 1-5 ft from the east wall, and provided bench support for the apartments on the west side of the living quarters. Ten feet east of the central column and 5 ft from the east outer wall was the east column, which also provided bench support for the apartment on the east side. The west column was 10 ft west of the central column, 5 ft from the center wall, and was a component of the bench line in the storeroom. The central column contains 17 (34%) of the 50 large poles found in the structure. The east column and west column contain 7 (14%) and 9 (18%) large poles, respectively. Clearly, the central column, which would be under the apex of a roof spanning 30 ft would have to absorb the heaviest load and would, therefore, require more large poles. The archaeological evidence bears this out. The large poles in the three columns are also aligned and evenly spaced to provide support directly under 5 major crossbeams. These 5 groups are perpendicular to the long walls. Three of the group are in partition walls. The remaining two are in the vestibules. The spacing is from north to south: 14.5 ft to 13.5 ft to 17 ft to 17.5 ft. There are two key posts at each end of the structure. At the north end, one is on the east side of the entrance and the other is adjacent to the central long wall. At the south end, one is 5 ft from the entrance in the vestibule wall and the second is in the central long wall. One key post at each end is a component of the central support column.

The orientation of House 9 is NE-SW. The minimum distance to the palisade is 4 ft, measured from the southwest corner of the house to the west palisade wall. The west wall of House 9 is parallel to and 20 ft from the north palisade wall. This orientation was probably selected because it provided maximum use of the available space and minimized the effect of the 2.5° terrace slope. The palisade provided protection from the prevailing NW winds. The minimum distance to House 8 is 20 ft.

Structure 7

Structure 7 is rectangular in shape with straight end walls and square corners; it corresponds to that dotted in on Frontenac's map inset as shown in Figure 7. It is 57.5 ft long and 20 ft wide. A central wall extends along the mid line, dividing it into two equal compartments 50 ft long and 10 ft wide. Bench lines run the full length of the north and south walls and are 4 ft and 2.5 ft wide, respectively. There is no evidence of hearths in the building.

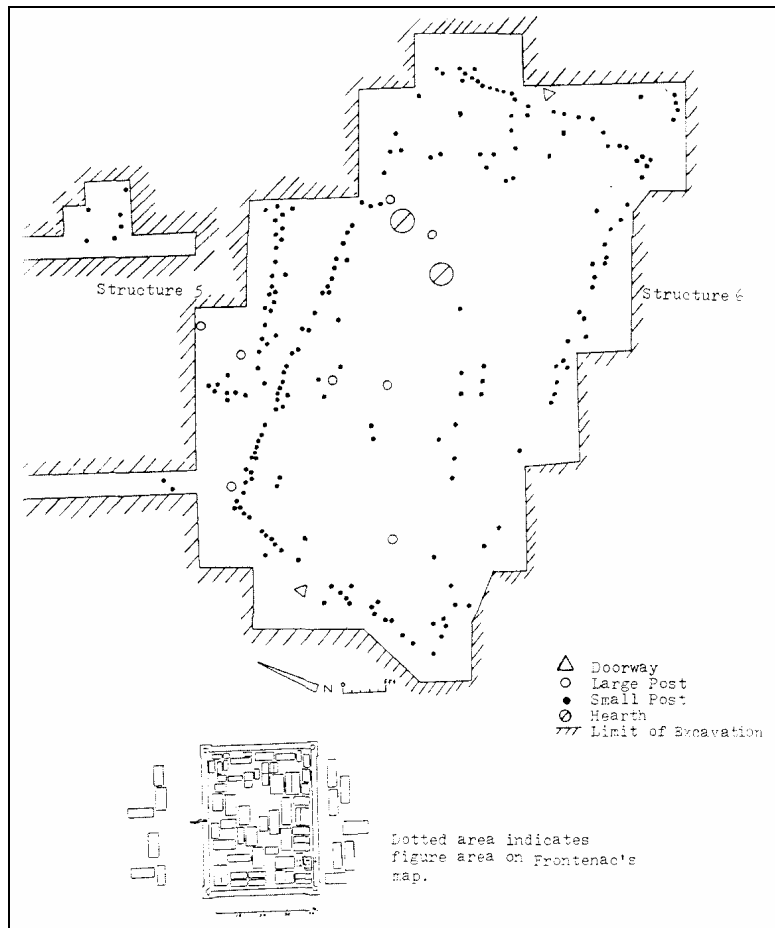


Figure 9. Portion of excavated area showing floor Patterns of Structures 5 and 6.

This structure is most likely a storehouse, since the internal features necessary for living quarters are absent. The compartments are too narrow to be apartments but they are wide enough to be storage vestibules. Also, the central wall obliterates the central corridor, the only safe area for a hearth in a building this size. The bench lines are too narrow to be bed platforms but wide enough to provide shelf space for barrels or other storage containers. The width of the two compartments is identical to the width of the storeroom in House 9. Apparently the 10 ft width provided optimum room for shelf space on all available walls and an adequate corridor. Freestanding rectangular storehouses were present at least by 1634, when van den Bogaert on his journey to Oneida describes the storehouses in a Mohawk town this way:

There are more houses on the opposite bank of the waterway, however, we did not enter them because there were mostly full of grain. The houses in this Castle are full of grain and beans [Gehring and Starna 1988: xxi].

While fleeing justice after committing a crime in Fort Oran-e thirteen years later in 1647, van den Bogaert this time does not hesitate to enter a Mohawk storehouse. Unfortunately for him, he was soon captured in the storehouse but not before burning it to the ground during an altercation (Gehring and Starna 1988: xxi).

Almost all of the post molds in the four outer walls and one inner wall appear to be set in pairs with no obvious alignment pattern. In some sections the post molds are scattered. This may indicate rebuilding on the same location following destruction or reinforcement or replacement of rotting poles. The 53 ft long central wall starts on the building's mid line, 5 ft from the short west wall, continues straight to the east wall, and extends 2.5 ft beyond it outside the structure. Near the center of the wall is a 2 ft wide doorway. The wall was constructed of small poles identical in diameter, depth into the subsoil, and vertical orientation. The poles were arranged in the same irregular paired pattern as the small poles in the outer walls.

The south wall is 56 ft long and consists of small poles arranged in an irregular paired pattern of approximately 7.5 poles/5 ft. There are also 6 large poles in the wall, 3 at each end. Three other large poles are near the south wall; two are a foot inside and the third is 1.5 ft outside the wall. The 57.5 ft long north wall was built with small poles set in an irregular paired pattern and spaced roughly 6 poles/5 ft. The north wall contains one large post at the far west end. Post molds were difficult to discern due to adverse soil along the west half of the wall, resulting in large gaps in the wall. The west wall is 20 ft long with a 2.5 ft wide doorway near the center. The east wall is 19 ft long with two doorways, each 2.5 ft wide. The doorways are on each side of the central wall, which bisects the east wall. The east and west walls were made of poles with the same size and spacing as in the long walls.

The superstructure is singular in that all the large support poles on the south half are in or are within 1.5 ft on either side of the long south wall. The superstructure consists of 5 groups of large crossbeam support posts evenly spaced the length of the building. The spacing is from east to west: 10 ft to 12.5 ft to 11 ft to 15 ft. The 5 groups form two columns roughly 15 ft apart. One column is 5 ft to 7 ft from the north wall and the other column is in the south wall. The column on the north half may also be

part of a bench line. There is no central column of large support posts. However, the small posts of the center wall may have functioned in that capacity. The orientation of the storehouse is NW-SE, parallel with the prevailing winds. The minimum distance to the palisade is 6 ft and the minimum distance to House 6 is 25 ft.

Structure 6

As previously noted, difficult soil conditions in some areas prevented full definition of several walls and internal features in House 6 (see dotted structure on Frontenac's inset map as shown in Figure 9). The topsoil on the western third of the house is only 6 in to 9 in deep. Years of plowing undoubtedly obliterated hearths and other internal features from the topsoil and superficial subsoil layers. In the central section of the house numerous rocks and boulders hindered detection of archaeological remains. Nevertheless, a sufficient number of post molds and features characteristic of a residence were recorded to define Structure 6 as a longhouse.

House 6 is approximately 62.5 ft long and 28.5 ft wide and it is roughly rectangular. All the walls are straight and join to form nearly right-angled corners. The long north and

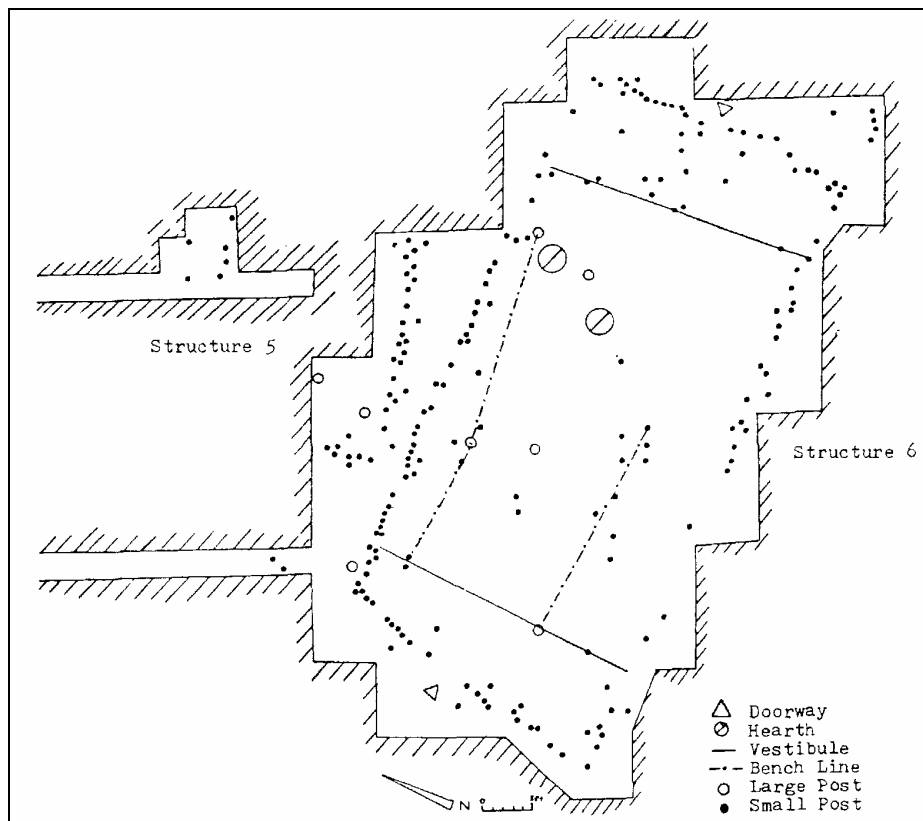


Figure 10. Map of structure 6 illustrating the architectural features.

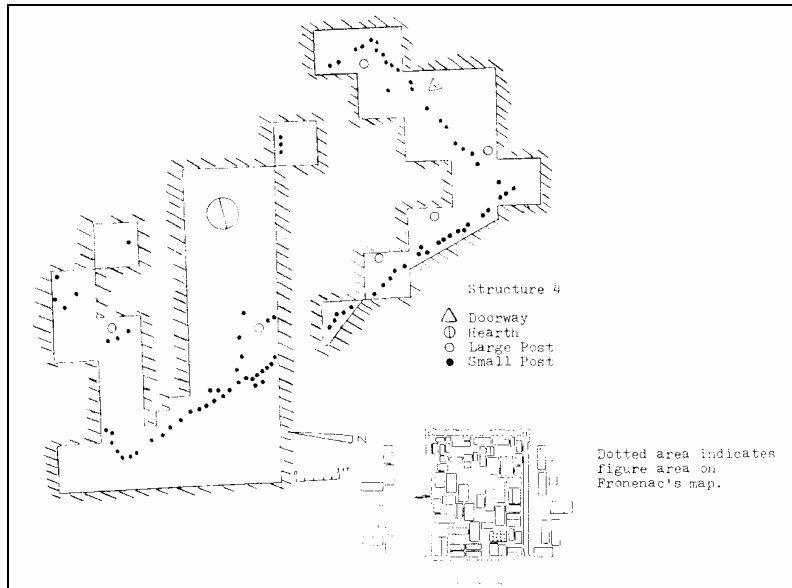


Figure 11. Portion of excavated area showing floor pattern of Structure 4.

south walls are 56 ft and 62.5 ft, respectively, and the short east and west walls are 27 ft and 28.5 ft respectively. The entrance in the east wall is near the center and is 2 ft 2 in wide. In the west wall the entrance is 3 ft 8 in wide and also near the center of the wall. A storage vestibule 8 ft long and 27 ft wide, providing 216 square feet of space, is at the east end of the house. The storage vestibule at the west end is about 7 ft long and 28.5 ft wide and provides 200 sq ft of storage space.

Two hearths were located. One is in the central section of the house and 3 ft from the center line. It measures 1 ft 7 in in diameter, extends 4 in into the subsoil, and has a saucer shaped profile. The base of the hearth had a 2 in layer of white ash covered with 3 in of black soil containing a scattering of charcoal and artifacts. The second hearth is 4 ft front the north wall and near a bench line. It is 2 ft in diameter and the base is on the surface of the subsoil.

There is an 18 ft long apartment along the north wall. A 4 ft wide bench line extends the full length. Large support posts and small posts form the partitions and bench line. There is an irregular line of small posts 6 ft from the south wall in the western half of the building. Their function could not be resolved but they may represent another bench line. Interestingly, the north wall contains three large posts. Two posts are in the center of the wall and the third is near the northwest corner. House 6 is a minimum of 4 ft from the south wall of the palisade. It is also a minimum of 25 ft from Structure 7 and 2 ft from Structure 5. House 6 is oriented in a NW-SE direction.

Structure 5

Only the southwest corner, 18 ft of the south wall, and 6 ft of the west wall were discerned (see dotted structure on

Frontenac's inset map as shown in Figure 9). The walls are straight and join to form a 90 angle at the corner. Structure 5 is oriented EW. The post molds on the south wall have a well-defined staggered or zigzag pattern. Paul Lennox describes this pattern as common on Huron sites (Lennox 1984:16). He explains the construction pattern this way:

.. the post pattern consisted of two rows of posts, one row which would have formed the inside of the house wall and the other row that formed the outside of the house wall. Rather than bark being woven into the walls as a building material, something more substantial may have been used, as the distance between the inside and outside wall posts was at least 10 cm and would likely have been too substantial a distance to have held bark in place. Perhaps at least along the lower portion of the walls, poles about the size of wall posts were laid horizontally between the innermost and outermost wall posts. Such a method of construction would conceivably have added a degree of warmth and stability to the structure [Lennox 1984:16].

Lennox continues on about Huron house construction to say, "The end walls are usually defined by a single row of posts broken by an entranceway" (Lennox 1984:16). Although only 6 ft of the west wall was exposed, it appears to be a single straight wall of posts. Structure 5 was the only building dis-

covered with a zigzag post mold pattern. It is possible that this is archaeological evidence of Iroquois cultural assimilation. In this case, the architectural result would have been of Huron adoption.

Structure 4

Structure 4 was not completely excavated (see Figure 11). However, enough internal features were observed to identify it as a longhouse. The house is 52 ft long and 22.5 ft wide. The small poles of the outer wall are spaced 6 poles/5 ft. The southeast wall has a 2.5 ft entranceway near the center. Five feet in from the southwest wall is a column of large posts which are probably part of a bench line and weight-bearing superstructure. Associated with these posts is a short line of small posts which may represent a partition.

One large hearth 3 ft in diameter is in the center section of the house, 2.5 ft from the center line. The profile is saucer shaped and it penetrates 4 in below the subsoil surface. There was a 2 in layer of white ash at the base of the hearth. This layer was covered by 3 in of black soil filled with charcoal and a scattering of artifacts. There is an irregular arrangement of small posts at the northwest end of the house which may be part of a vestibule. If it is, it is approximately 6 ft long and 22 ft wide. A storage vestibule that size would provide 132 square feet of storage. House 4 is oriented in a NW-SE direction.

Structure 2

Structure 2 could not be outlined completely due to the high gravel and soft dark shale content of the soil (see Figure 12). The topsoil is also shallow with an average depth of 10 in. Deep plowing over the years likely destroyed remains of shallow features and post molds. Some meaningful information can still be gleaned from the data. The structure is 19.5 ft wide. The length could not be determined. Two large posts 3.5 ft from the south wall are probably part of a bench line and/or a column of weight-bearing posts. One large post 6 ft from the north wall may be part of the same structure on the opposite side of the building. Structure 2 is a minimum of 20 ft from Structure 3 and a minimum of 32 ft from Structure 1. It is oriented in an E-W direction.

Structure 3

Structure 3 is located on the same type of soil as Structure 2 (see Figure 12). The rows of wall post molds are obvious on the sandy-clay soils but are not visible on the coarse gravel soils. Only the northeast corner and short sections of two walls were recorded. Pole diameter ranged from 3 in to 4 in. The poles were spaced 6.5 poles/5 ft. Structure 3 is probably a small house no longer than 35 ft. If the building were longer it would overlap House 4 and no evidence of this was recorded during the excavation of House 4. House 3 was likely oriented N-S.

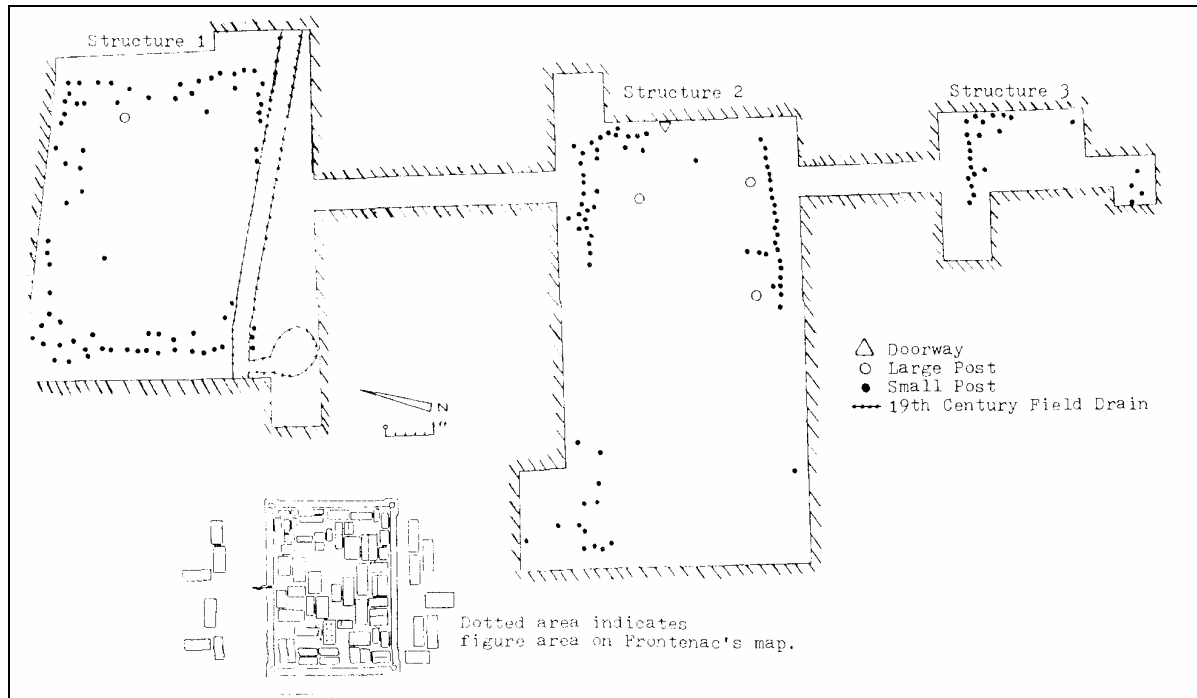


Figure 12. Portion of excavated area showing floor pattern, of Structure 1, 2, and 3.

Table 4. Summary of Long house Traits

House No.	Orientation	Length	Width	Bench/Bed Width	Door Width and Locus	Corridor Width	Central Line of Hearths
1	N-S	N/A	25'	4', 5'	N/A	N/A	N/A
2	E-W	N/A	19.5'	3.5', 6'	N/A	c.10'	?
3	N-S	c.35'	N/A	N/A	N/A	N/A	N/A
4	NW-SE	52'	22.5'	5'	2.5' SE End N/A NW End	N/A	N/P
5	E-W	N/A	N/A	N/A	N/A	N/A	N/A
6	NW-SE	62.5'	28.5'	4', 6'	2.2' SE End 3.7' NW End	10'-15'	N/P
7*	NW-SE	57.5'	20'	4', 2.5'	2.5' SE End 2.5' SE End 2.5' NE End	6'-7'	N/P
8	NW-SE	N/A	N/A	N/A	N/A	N/A	N/A
9A	NE-SW	70'	20'	***	4' NE End 2' SW End	10'	P
9B	NE-SW	63.7'	10'	4'	2.5' NW End 3.3' NE End	6'	N/P
10	E-W	N/A	N/A	6'	N/A	N/A	N/A

Structure 1

Almost the entire south wall of Structure 1 was destroyed in the nineteenth century when a field drain was constructed (see Figure 12). The excavated section of Structure 1 is the southern end of a longhouse. The house is 25 ft wide in this area. Irregular lines of small posts along the east and west walls likely represent bench lines. The scattering of posts at the north end of the excavation is probably a partition. This house is oriented N-S.

Structure 8

Only 262 square feet of Structure 8 was uncovered (see Figure 4). A small outer wall section and a scattering of small and large internal posts were revealed. The French map illustrates a structure at this location on the Weston Site oriented perpendicular to House 9. The 15 ft section of exposed outer wall is parallel to House 9. If this is the structure depicted on the map, it is slightly shorter than House 9 and oriented NW-SE. Structure 8 is a minimum of 20 ft from House 9.

Structure 10

Only 125 square feet was excavated and recorded (see Figure 4). An 8 ft section of the outer wall and several large and small posts were revealed. The building is 80 ft outside the north wall of the palisade. This house is oriented E-W.

Discussion of Results

Close examination of the archaeological evidence uncovered at the Weston Site demonstrates that it is more than likely that depicted in the Frontenac map (Figure 2). Moreover, with a little caution, the map can be used as a reasonably accurate source of additional information about the site. All ten structures, the three palisade sections, and the bastion uncovered on the site are easily located on the map.

Valuable information on longhouse size can be gathered from the map by comparing the length measurements of the buildings completely excavated with the Structures on the map. The sizes varied considerably, with one longhouse about 90 ft, but most between 50 ft and 80 ft. The smallest structures were about 20 ft to 35 ft long. About 35 percent of the buildings were 40 ft or less (Table 4). The above figures are estimates made by comparing house length found during the excavation with the house diagram on the French map.

A mapping convention altered the structure density in the village. The excavations reveal the distances between the structures are greater than the French map indicates. The optimum distance between structures appears to be between 20 ft and 30 ft. However, on at least one point on each of the three completely excavated structures the building is within 5 ft to 6 ft of another structure or the palisade. This is possibly a defensive measure designed to create bottlenecks that restrict movement of attackers and make it easier for small groups to defend large areas.

Table 4 continued. Summary of Longhouse Traits

House No.	Offset Line of Hearths	Overall House Shape	House Ends	Partitions	Baffles	Storage Pits	Vestibule
1	N/A	R	F	P	N/A	N/P	?
2	?	R	F	?	N/A	N/P	6'-7' E End N/A SE End
3	N/A	N/A	F	N/A	N/A	N/A	?
4	P	R	F	N/A	N/A	N/A	c. 6' NW End N/A SE End
5	N/A	N/A	F	N/A	N/A	N/A	?
6	P	R	F	P	N/A	N/P	8' SE End 7' NW End
7*	N/P	R	F	**	N/A	N/P	--
8	N/A	N/A	N/A	N/A	N/A	N/A	P
9A	N/P	R	F	P	N/P	N/P	13' NE End 11.2' SW End
9B	N/P	R	F	N/P	N/P	N/P	N/P
10	N/A	N/A	N/A	?	N/A	N/A	N/A

Table 4 after Pratt and Pratt (1977:D4)

Thus, at this time, the Onondaga were living within a compact fortified village, in homes of traditional longhouse architecture like their ancestors. Long longhouses like the 334 ft Oak Hill Phase Howlett Hill Site house or the 400 ft Chance Phase Schoff Site house are no longer present. All the structures at the Weston Site appear to be under 100 ft. Although small structures such as the 35 ft house at the Howlett Hill Site are found on early sites, in general, there is a decrease in average house length on Onondaga sites. This trend continues into the eighteenth century. Forty-seven years after Frontenac, in 1743, John Bartram describes the main Onondaga town this way:

The town in its present state is about 2 or 3 miles long, yet the scattered cabins on both side of the water are not above 40 in number, many of them hold 2 families but all stand single, and rarely above 4 or 5 near one another so that the whole town is a strange mixture of cabins, interspersed with great patches of high grasses, bushes and shrubs, some of peas, corn and squash [Bartram 1751:41-4].

Apparently, by mid-eighteenth century, the close communal life style within a fortification had been discontinued in favor of more independent living in

smaller family communities. Another possible explanation is the threat of war

may have diminished and they felt secure enough to live without fortress walls. However, in 1756 thirteen years after Bartram's visit, Sir William Johnson built a fort for this town. A third possibility is that the people living in Onondaga Valley were the more progressive Onondaga. The people living in the traditional uplands at Tue-tah-das-o (Coye Site) may have continued the close communal life style of their ancestors. The establishment of the new dispersed community may have been partially due to health concerns. Perhaps a century of recurring epidemics taught them that a community scattered over a large area can quarantine the ill citizens more easily than a densely populated community confined to a small area.

House alignment in relationship to the prevailing winds and the possible secondary function of the palisade as a baffle or snow fence has long been considered by archaeologists. The map shows that, of the 53 structures within the palisade, 29 were oriented east-west and 22 were oriented north-south. The remaining two structures were square and, therefore, had no recognizable orientation (Figure 13). Despite a second mapping convention that placed all structures at right angles to each other and to the palisade, the realignments were minor and did not distort the data. Since the prevailing wind is from the northwest, structures oriented in a north-south direction would need the most protection. All but 4 of the 22 north

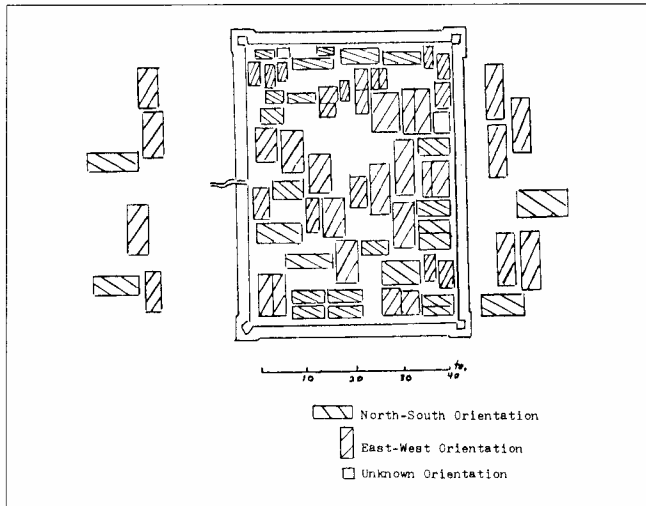


Figure 13. Village plan insert from the French map redrawn to illustrate the compass orientation of each structure.

south oriented structures are adjacent to the palisade. Three of the remaining 4 are on the low end of the terrace and probably benefited from the high west ridge. The remaining structure is on a high elevation on the village site but may have been shielded by another building. Since this structure is very narrow, it may have been a storehouse and orientation was not an important factor. Significantly, all of the structures in the center of the fort and therefore the most exposed to the wind were oriented in an east-west direction. Building orientation for streamlining and taking advantage of the palisade as a baffle, then, were important considerations in village design at the Weston Site. Of the 13 structures outside the palisade, as depicted on the map (Figure 13), 9 are oriented east-west. Two of the remaining four are low on the terrace and were likely protected by the west ridge. The other two are midway on the terrace and may have been similarly protected or may have had baffles.

Another map-illustrated village feature is the large plaza located almost in the center of the village. In the sixteenth century, Cartier describes the St. Lawrence Iroquois town of Hochelaga as having in "...the middle of the town ...an open square, a stone's throw or thereabouts in breath" (Lescarbot 2:112, 443). The south end of the square on the Weston Site is bordered by the two largest structures in the village. One is the longest, probably 90+ ft and the other is the widest and almost square. Since the councils of the Five Nations were held at Onondaga, it is easy to imagine that one was probably the council house. Located throughout the rest of the village are seven other smaller plazas with houses opening onto them. These may represent subdivisions in the village according to clans.

The settlement pattern element undergoing the greatest architectural change during the seventeenth century

was the fortification system. The basic defensive structure was well established early in the Onondaga Iroquois continuum and remained almost unchanged until after European contact in the seventeenth century. It consisted of 1, 2, 3, or sometimes 4 parallel walls of poles encircling the village. Sometimes the stockade was supplemented with an earthen ring and/or ditch. The archaeological evidence on the few prehistoric Onondaga sites where the stockade has been exposed is remarkably constant. Most of Ritchie's observations about the two stockades he found at the Oak Hill Phase Kelso Site apply to the other prehistoric Onondaga sites:

The fortification features of the site are of considerable interest, being the earliest known for the eastern Iroquois. Each community had protected itself behind a double, in places treble-walled enclosure, roughly ovate in shape, composed of sapling poles set into the ground, apparently by a screwing or oscillatory twisting motion, not by digging, the power probably being provided by two strong men, one on either side, and doubtless done in the spring when the ground was soft enough for this purpose. As shown by the post molds- these stockade elements ranged from three to six inches in diameter, three to four inches for most, penetrated into the light-colored subsoil for from eight to seventeen inches, were individually spaced <iv to eight inches apart, and from the sectioned profiles, had bluntly pointed bases, such as might have been produced by felling with the stone celt [Ritchie 1965:306].

Walls of large posts were sometimes constructed at the village periphery in areas favorable for assault. Pratt and Pratt described such a wall on the slightly later c. A.D. 1400 Chance Phase Onondaga Iroquois Crego Site as follows:

In only the north stockade section did large post molds occur. This might be expected since that location. Much borders the Seneca River, was, therefore, the most susceptible and possibly vulnerable to surprise attack [Pratt and Pratt 1997:38].

A circular fortification of this nature, with parapets, was fairly effective against small, unorganized bands of invaders with axes and bows and arrows. However, by mid-seventeenth century, raids were being conducted increasingly by larger, well-organized Indian armies with more effective European weapons (Heidenreich 1971:142).

The defense design most often used by all European countries to protect villages was the square, straight walled, four-bastioned fort. This architectural form had the advantage of being both flexible and economical. It could be modified to adapt to any terrain and it could be constructed with any readily available building material: earth, wood, stone, and/or brick (Robinson 1977:23). In the remote areas of the Northeast, where artillery could not be easily employed by attackers, this fort form was frequently erected with logs placed vertically into the ground. It proved to be an effective defense against all weapons except cannons. At least by the first half of the seventeenth century, the Europeans were recommending this fort design to their Indian allies. In 1636 the Jesuits in Huronia chronicled:

...for the small number of men, the lack of arms, the multitude of enemies, cause them to dread the weakness of their forts We have told them also that henceforth they should make their forts square, and arrange their stakes in straight lines, and that, by means of four little towers at the four corners, four Frenchmen might easily with their arquebuses or muskets defend a whole village. They are greatly delighted with this advise, and have already begun to practice it at la Rochelle [JR 10:52-53].

The effectiveness of the square, bastioned fort in frontier warfare was documented in a 1663 Jesuit account of an Iroquois attack on a Susquehannock town (the Strickler Site):

Raising, accordingly, an army of eight hundred men...they prepared to make a general assault, planning, as is their wont, to sack the whole village and return home at the earliest moment, loaded with glory and with captives. But they saw that this village was defended on one side of the stream, on whose banks it was situated, and on the opposite by a double curtain of large trees, flanked by two bastions erected in the European manner, and even supplied with some pieces of Artillery. Surprised at finding defenses so well-planned, the Iroquois abandoned their projected assault. [JR 48:77-79].

The archaeological evidence and ethnohistoric accounts indicate that the Onondaga had a European style, square, straight-walled, four-bastioned fort at the Weston Site. Two days before Frontenac launched his 1696 attack on the fortress, from Onondaga Lake, the Onondaga burned it to the ground and retreated. When the French arrived at the ruined village they observed:

The wigwams of the Indians and the triple palisade around their fort was found

entirely burnt. It has since been ascertained that it was a tolerable strong state of defense. It was an oblong flanked by four regular bastions. The two rows of stockades that touched each other were of the thickness of an ordinary mast, and outside, at a distance of six feet, stood another row of much smaller dimensions but between 40 and 50 feet in height [O'Callaghan 1853-1887:IX:653].

Comparing the diameter of stockade poles to "...the thickness of an ordinary mast..." has poetic value, but it is too vague to be useful to the archaeologist. In the seventeenth century mast sizes varied widely, according to ship size and sail. For example, a ship's longboat had masts with a maximum diameter of 4 in and a large ship had masts over 2 ft in diameter. Which mast did the chronicler have in mind? Also, the diameter of a mast decreased from the deck level to the top of the mast. At deck level a common main mast was about 2 ft and at the top it was 3 in (Mahan 1980; zu Mondfeld 1989).

In European fortification terminology the two inner rows of posts in the structure referred to as the bastion at the Weston Site form the "curtain" and the outer wall is termed the "palisade" of the fortification. To the European, the curtain is the part of a bastioned fort that connects two bastions. The palisade is an outer defensive wall made of long poles usually spaced 6 in to 9 in apart in European-designed frontier forts (Robinson 1977). A bastion is an outward projection on the fort wall which enables the defenders to protect the land adjacent to the walls. It was a European introduction. To date, there is no archaeological evidence of bastions on any prehistoric Onondaga Iroquois site. Tuck (1971:72) in describing Ritchie and Funk's work at the Kelso site states:

Also revealed by these excavations...a probable bastion at a low point in the northeastern corner of the western stockade [Tuck 1971:172].

A review of Ritchie and Funk's site map reveals that the structure in question was a semicircular extension of the inside wall toward the village. If it was part of the village defense system, it was more likely a parapet. Ritchie (1965:303-308) does not comment on the structure.

Post mold patterns between the north and west curtains and the palisade line suggest the inclusion of *cul de sacs* in the defense system. It was not a standard feature of the European bastioned fortification. However, Pratt and Pratt (1997) found a similar *cul de sac* design at the Crego Site, indicating that despite total acceptance of a superior European plan, the Onondaga still maintained an original, apparently successful, design element. The straight curtains and palisade made it possible to enfilade the walls from the bastion. The weakest point in a fortification wall is the entrance. By placing it in the center of the north curtain wall it had equal pro-

tection from the northwest and northeast bastions. Ethnohistoric accounts also hint that the Onondaga fort may have had artillery. On September 14, 1687, the Onondaga requested of the mayor and aldermen of Albany "some great guns for our fort at Onondaga" (Fortescue 1964:442). The Albany officials' cautious response was dissuasive:

We will tell him (the Governor) of your request for great guns, but you are not wise in asking for cannon, for they would tend to your greater ruin if the French should surprise you, as they did the Senecas. The Governor has received a very angry letter from the Governor of Canada because he supplied you with ammunition. but his Excellency will stand by the Five Nations [Fortescue 1964:442].

No response from the governor is known to the author. Curiously, on the night the Onondaga burned their fortress the French recorded:

...a bright light was perceived in the direction of the Village, it was hence concluded that they burned it: some pretended even that they fired cannon [O'Callaghan 1853-1887:IX:652].

The Jesuit historian Charlevoix credits the English with building the fort at Onondaga (Charlevoix 1897:V:17). The fortification design is clearly European but the post mold patterns indicate that the Onondaga were the builders. The pole size and method for setting them were the same as those used for erecting the traditional longhouse. The English method for stockade construction was different:

The stockade consisted of a series of posts or logs- from 15 to 18 feet long and 12 inches or more thick- sharpened at one end and hewed flat on opposite sides. The line of stockage being marked out, a trench three feet deep was dug: the posts were set therein, the flattened sides together, and the earth shoveled back and rammed against them [Howell 1886:34-35].

In the seventeenth and eighteenth centuries the British colonial governors were instructed to defend and protect their Indian allies. Additionally, they were given authority to build forts and other structures deemed necessary to provide this service (LaBaree 1967:464). Unfortunately, full funding of the projects was not usually provided. Under those circumstances, the English probably just supervised the construction or at best provided a small work detail to assist the Onondaga, the same

way, they helped the Mohawks fortify their new town in 1689 (Munsell 1870:11:113).

The Frontenac map (Figure 2) also depicts 13 structures of equal size outside the fortress. Six are north and seven are south of the fort. Only a small section of five-foot squares was excavated in one structure north of the fort. From this scant information, it appears it was erected in the same manner as the longhouses inside the fortress. One important characteristic is that all buildings are shown about the same size, approximately 80 ft to 90 ft rather than the wide range of structure sizes shown inside the fortification. This suggests that the 13 structures were pre-planned and built in anticipation of future general requirements, while the structures inside the fortification were built to satisfy immediate individual needs. More specifically, since the councils of the Five Nations were held at the Onondaga capital, the 13 structures may have been the lodges for the council members and their entourages from the other four nations. It is easy to imagine three houses each for the Mohawks, Oneidas, and Cayugas, and four for the large Seneca Nation.

Another explanation for the 13 outbuildings was to accommodate village expansion. From 1670, shortly before the Weston Site village was established, to 1690, the Onondaga population increased from 1300 to 2000; an increase of roughly 35 percent (Snow 1992:184). From 1690 to 1700 there was a very sharp population decrease from 2000 to 1000, due largely to disease and war. The population rises again in the first quarter of the eighteenth century, but soon starts to decline again, until it stabilizes at approximately 800 by mid-century (Snow 1992:184). Curiously, Bartram apparently sensed the general depopulation during his visit to Onondaga in 1743. He wrote:

It seems however to have been more considerable when it became a conquest to the arms of Lewis 14th, at which time it must have been more compact, for history relates it to have been stockaded [Bartram 1751:42].

Conclusions

Thus, the settlement pattern at the Weston Site presents strong evidence for being the Onondaga town attacked by Frontenac in 1696. All ten structures, the palisade line, and the bastion can be easily located on the insert drawing of the village on the manuscript map of the raid. The unique floor plans of the storehouse and House 9 are unmistakable and readily recognized on the map.

The fortification form demonstrates an acknowledgement of the changes in warfare brought about in part by Europeans and the ability of the Onondaga to accommodate change. Nevertheless, house design, construction, and internal architecture show a continuation into the late seventeenth century of all the features of the traditional Iroquois longhouse. All of the excavated longhouses at the Weston Site evidence tradi-

tional longhouse compartmentalization architecture. There was an entrance and storage vestibule at each end. The remainder of the house was divided into roughly equal size compartments with bed lines along both outer side walls and a corridor through the center. Each compartment had a central hearth, which was shared by two families, one on either side of the fire. To provide a degree of privacy, partitions were erected. The superstructure design was also traditional Iroquois. The large roof support poles were uniformly set about 5 ft in from the side walls. They also supported bed lines and partitions. Despite that continuity, a significant change in the longhouse continuum is apparent. The longest house is well under 100 ft and many are under 50 ft. Sometime before the third quarter of the seventeenth century, the long longhouse had disappeared and been replaced by much shorter houses of two or three hearths.

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References Cited

- Bartram, John
1751 *Observations on the Inhabitants, Climate, Soils, Rivers, Productions, Animals, and other matters worthy of Notice Made by Mr. John Bartram*. J. Whitson and B. White. London.
- Charlevoix, P. F. X.
1897 *History and General Description of New France*. Translated by John Gilmary Shea. 6 vols. Loyola University Press, Chicago.
- Fortescue, J. W., editor
1964 *Calendar of State Papers, Colonial Series, America and West Indies, 1655-1688*. Kraus Reprint, Ltd., London.
- Gehring, Charles T, and William Starna
1988 *A Journey into Mohawk and Oneida Country. 1634-1635. The Journal of Harmen Meynderstsz van den Bogaert* (translated, edited and annotated by the authors). Syracuse University Press, Syracuse.
- Heidenreich, Conrad
1971 *Huron A History and Geography of the Huron Indians 1600-1650*. McClelland and Stewart. Toronto.
1978 *Seventeenth-Century Maps of the Great Lakes: An Overview and Procedures for Analysis*. In *Archivaria* No. 6:83-112.
- Howell, Tenney
1886 *History of the County of Albany, N Y., From 1609-1886*. W. W. Munsell & Co., New York.
- Hutton, Frank, Jr., and C. Erwin
1977 *Soil Survey of Onondaga County, New York*. United States Department of Agriculture in Cooperation with Cornell University Agricultural Experimental Station.
- JR: see Thwaites, Reuben G.
- Kapches, Mima
1993 *The Identification of an Iroquoian Unit of Measurement: Architectural and Social/Cultural Implications for the Longhouse*. In *Archaeology of Eastern North America*, edited by Arthur Spiess, 21:137-162. Eastern States Archaeological Federation, Bethlehem, Connecticut.

Labaree, Leonard W., editor

1967 *Royal Instructions to British Colonial Governors 1670-1776*. vol. II. Octagon Books, Inc. New York.

Lennox, Paul

1984 *The Hood Site: A Historic Neutral Town of 1640 A.D.* National Museum of Man Mercury Series. Archaeological Survey of Canada, Paper 121, Ottawa.

Lescarbot, M.

1911 *The History of New France*. vol. 2. W. L. Grant and H. P. Bigger, editors. The Champlain Society, Toronto.

Mahan, Alfred Thayer

1980 *The Influence of Sea Power Upon History 1660-1805*. W. H. Smith Publishers. Inc., New York.

Munsell, Joel

1870 *The Annals of Albany*. vol. II. Joel Munsell,

O'Callaghan, E. B.

1850 *The Documentary History of the State of New York*. vol. I. Weed, Parsons and Co., Albany.

O'Callaghan, Edmund B.

1853- Documents Relative to the Colonial History of the
1887 State of New York. Procured in Holland, England and France by John Romeynd Brodehead. Weed, Parsons and Co., Albany.

Parker, Arthur C.

1910 *Iroquois Uses of Maize and Other Food Plants*. New York State Museum Bulletin, no. 144. University of the State of New York, Albany.

Pratt and Pratt Archaeological Consultants, Inc.

1997 *Stage 3 Cultural Resource Survey, Crego Site, Town of Van Buren, Onondaga County, N Y*. Report prepared for Consolidated Gas Transmission Corporation, Clarksburg. West Virginia.

Ritchie, William A.

1965 *The Archaeology of New York State*. Natural History Press, Garden City. New York.

Robinson, Willard B.

1977 *American Forts: Architectural Form and Function*. University of Illinois Press, Chicago.

Sagard, Gabriel

1939 *Sagard's Long Journey to the Country of the Hurons*. George M. Wrong, editor. The Champlain Society. Toronto.

Snow, Dean

1992 Disease and Population Decline in the Northeast. In *Disease and Demography in the Americas*, edited by J. W. Verand and D. H. Ubelaker, pp. 177-186. Smithsonian Institution Press, Washington.

1995 *Mohawk Valley Archaeology: The Sites*. Occasional Papers in Anthropology No. 23. Pennsylvania State University. University Park, Pennsylvania.

Tuck, James A.

1971 *Onondaga Iroquois Prehistory*. Syracuse University Press, Syracuse.

Thwaites, Reuben G.

1896- *The Jesuit Relations and Allied Documents*.

1901 *Travels and Explorations of the Jesuit Missionaries in New France, 1610-1791*. 73 vols. Burrows Brothers Co., Cleveland.

zu Mondfeld, Wolfram

1989 *Historic Ship Models*. Sterling Publishing Co., Inc., New York.

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The New York State Historic Preservation Office Archaeology Program, 1990 to 2000: A Ten-Year Retrospective

Robert D. Kuhn, New York State Office of Parks, Recreation and Historic Preservation

The New York State Historic Preservation Office (SHPO) administers a statewide historic preservation program guided by state and federal statutes, principally the National Historic Preservation Act of 1966 and the State Historic Preservation Act of 1980. The archaeology component of this program is an important part of SHPO activities. It includes: maintaining a statewide inventory of archaeological sites and archaeological survey reports, reviewing development projects to assess potential project impacts to archaeological resources, determining site significance, and nominating significant sites to the State and National Register of Historic Places. This paper provides a ten-year retrospective of archaeology program activities at the New York SHPO, focusing on the survey, inventory, and compliance components of the program.

Introduction

In New York State, the Field Services Bureau of the Office of Parks, Recreation and Historic Preservation serves as the State Historic Preservation Office (SHPO). The SHPO was established after the passage of the National Historic Preservation Act of 1966 in order to implement the legislative mandates of that act in New York State. The act established the responsibilities of the SHPO, key elements of which include: maintaining and expanding a statewide inventory of historic properties, nominating properties to the National Register of Historic Places, and participating in the review of federal undertakings that affect historic properties. The act also envisioned that the SHPO would play a leadership role and provide technical expertise, guidance and assistance on historic preservation issues within the state.

In 1980, the passage of the New York State Historic Preservation Act greatly expanded the responsibilities of the Office of Parks, Recreation and Historic Preservation. The act established a State Register of Historic Places modeled after the National Register, and a review process for state agency projects modeled after the existing review process for federal Undertakings. Implementing the programs created by the State Historic Preservation Act was made part of the responsibility of the Field Services Bureau, or SHPO.

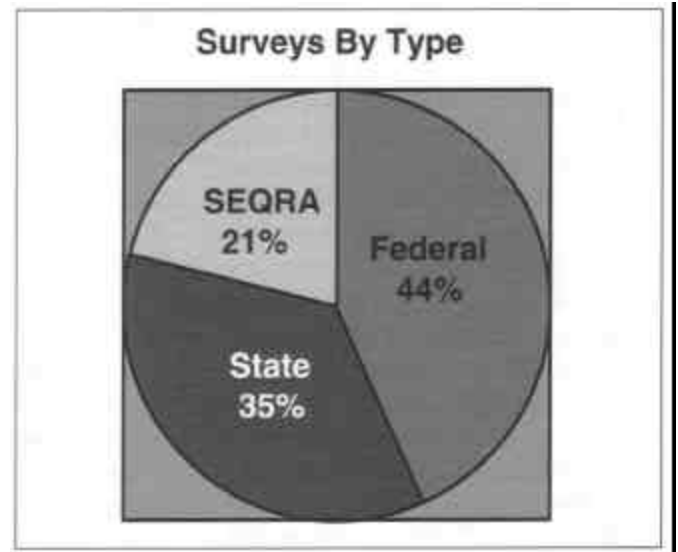


Figure 1. The distribution of archaeological survey reports received by the SHPO for FFY 1996 through FFY 1999. Federal= Surveys generated by Section 106 projects; State = Surveys generated by Section 14.09 projects. SEQRA = Surveys generated by municipalities conducting local SEQRA reviews.

This paper provides a ten-year retrospective of archaeology program activities at the New York SHPO, from Federal Fiscal Year (FFY) 1990 through FFY 1999. Statistics are provided for key elements of the survey, inventory, and compliance program to illustrate the ongoing level of effort across the state in these program areas. A list of archaeological sites that received data recovery excavations is included, and the time periods represented by these sites are provided in tabular form.

Survey, Inventory, and Compliance Program

In New York State most archaeological survey and inventory activities are conducted as a result of federal, state, or local review and compliance mandates. These activities can be required by Section 106 of the National Historic Preservation Act of 1966 (NHPA); Section 14.09 of the State Historic Preservation Act of 1980 (SHPA); and, the State Environmental Quality Review Act of 1977 (SEQRA). Section 106 and Section 14.09 require Federal and State agencies, respectively, to consult with the SHPO regarding any undertaking that requires a Federal or State permit, license or approval, or that receives Federal or State funding

or financial assistance. Archeological surveys required as part of this consultation process are submitted to the SHPO for review and comment. SEQRA empowers local municipalities to require archaeological surveys for private development projects as part of the Environmental Impact Statement (EIS) process. When requested, the SHPO provides comment on such projects and surveys, serving in an advisory capacity.

The distribution of archaeological survey reports received and reviewed by the SHPO for FFY 1996 through 1999 is presented in Figure 1. The Federal (Section 106) component accounts for the largest proportion of the surveys, but both State (Section 14.09) and SEQRA reviews comprise a significant part of the program.

The distribution of survey reports by Federal agency for FFY 1996 through 1999 is presented in Figure 2. The survey activities of the two agencies that together comprise more than 50% of the Federal survey activity, the Federal Highway Administration (FHWA) and the Army Corps of Engineers (CORPS), are very different in their nature. Most FHWA projects are federally funded road or bridge reconstruction projects administered by the New York State Department of Transportation (DOT). FHWA surveys are often linear roadside surveys or surveys for bridge replacements. In contrast, most CORPS projects are privately funded development projects that require a permit from the CORPS because they will affect a federally designated wetland, or meet some other permit threshold. CORPS Surveys often include large blocks of acreage proposed for housing subdivisions, commercial developments, or industrial

parks. Although no other federal agency approaches the level of survey activity completed for the CORPS or FHWA, the other agencies combined account for close to one-half of the federal surveys in New York.

Similarly, State agency survey activities are dominated by a small number of big programs, and a large number of other agencies that are involved to a lesser extent. The distribution of survey reports by State agency for FFY 1996 through 1999 is presented in Figure 3. The Department of Environmental Conservation (DEC) and the Department of Transportation (DOT) account for almost two-thirds of the survey reports. Like CORPS, most of the DEC surveys are for privately-funded development projects that require a state permit. DOT and FHWA projects are the same except that the former are 10011c state-funded projects. Other agencies produce far fewer survey reports than DEC and DOT, but are equally important components of the program for different reasons. For example, agencies like the Empire State Development Corporation (ESDC), the Dormitory Authority (DA), the State University Construction Fund (SUCF) and the Department of Correctional Services (DOCS) provide massive amounts of direct state funding for major, high-profile construction projects around the state. These projects have produced substantial funding for archaeological investigations in recent years, many resulting in major Phase III excavations of significant sites.

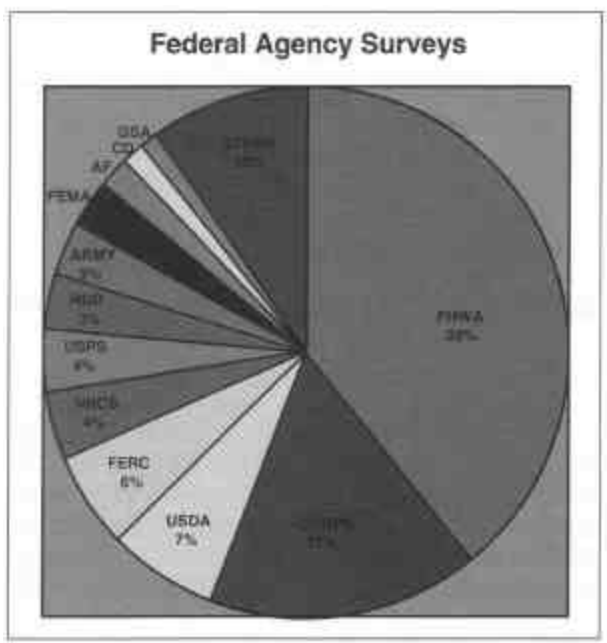


Figure 2. The distribution of archaeological survey reports by federal agency for FFY 1996 through FFY 1999.

Key

FWHA-	Federal Highway Administration
CORPS-	Army Corps of Engineers
USDA-	United States Department of Agriculture
FERC-	Federal Energy Regulatory Commission
NRCS-	Natural Resources Conservation Service
USPS-	United States Postal Service
HUD-	Housing and Urban Development
ARMY-	U.S. Army
FEMA-	Federal Emergency Management Administration
AF-	Air Force
CD-	Community Development Programs
GSA-	General Services Administration
OTHER-	All other federal agencies combined

The SHPO works with 27 Federal agencies and 25 State agencies on archaeological survey projects. Working with so many different agencies presents an on-going challenge for the SHPO in its efforts to encourage systematic and rigorous standards for archaeological survey and reporting. In an effort to begin to address this issue, the SHPO adopted the standards of the New York Archaeological Council in 1995 (NYAC 1994). The standards were distributed to Federal and State agency representatives as well as to consulting archaeologists working in New York State, and are now used by the SHPO to evaluate archaeological survey reports submitted for review.

The number of archaeological survey reports received and reviewed by the SHPO over the last ten years is presented in Figure 4. It is important to note that these statistics do not represent the totality of archaeological survey activity in New York for any given year. Many municipalities require archaeological surveys as part of the local SEQRA process but do not submit them for SHPO review, since a SHPO review is not required by SEQRA and our role is only advisory. Currently, we have no way of estimating the totality of archaeological survey activities at the local level across the state.

In general, the SHPO typically commented on 300 to 400 survey reports each year during this decade; however, there has been a significant increase in survey activity during the last two years. Anecdotally, this increase can likely be attributed to a combination of the following four factors:

1) The recent economic recovery in New York State from the recession of the early 1990s. Over the last few years the SHPO has seen yearly increases in the overall number of projects reviewed. In 1998 and 1999, for example, 34% more projects were submitted to SHPO for review than in 1996 and 1997. More development projects in the state lead to more archaeological surveys.

2) An increase in the number of archaeological surveys completed for Federal agencies in New York. 1998-1999 increases over 1996-1997 include: CORPS up 111%; HUD up 100%; NRCS up 92%; USPS up 37%; FHWA up 24%.

3) An increase in state agency compliance with Section 14.09 following legal action against the state by the New York Archaeological Council in 1996-1997. The number of state agency survey reports reviewed during 1998-1999 represented a 115% increase over the number reviewed in 1996-1997.

4) An increase in the number of SEQRA surveys submitted for review, as more municipalities across the state recognize the need to address archaeological impacts in the EIS process. The number of SEQRA survey reports reviewed during 1998-1999 represented an 86% increase over the number reviewed in 1996-1997.

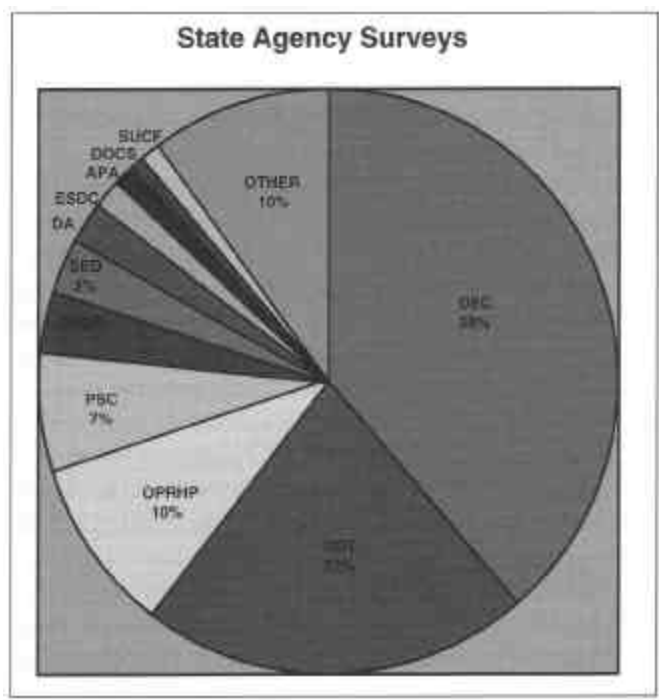


Figure 3. The distribution of archaeological survey reports by state agency for FFY 1996 through FFY 1999.

Key

DEC-	Department of Environmental Conservation
DOT-	Department of Transportation
OPRHP-	Office of Parks, Recreation and Historic Preservation
PSC-	Public Service Commission
DHCR-	Department of Housing and Community Renewal
SED-	State Education Department
DA-	Dormitory Authority of the State of New York
ESDC-	Empire State Development Corporation
APA-	Adirondack Park Agency
DOCS-	Department of Correctional Services
SUCF-	State University Construction Fund
OTHER-	All other state agencies combined

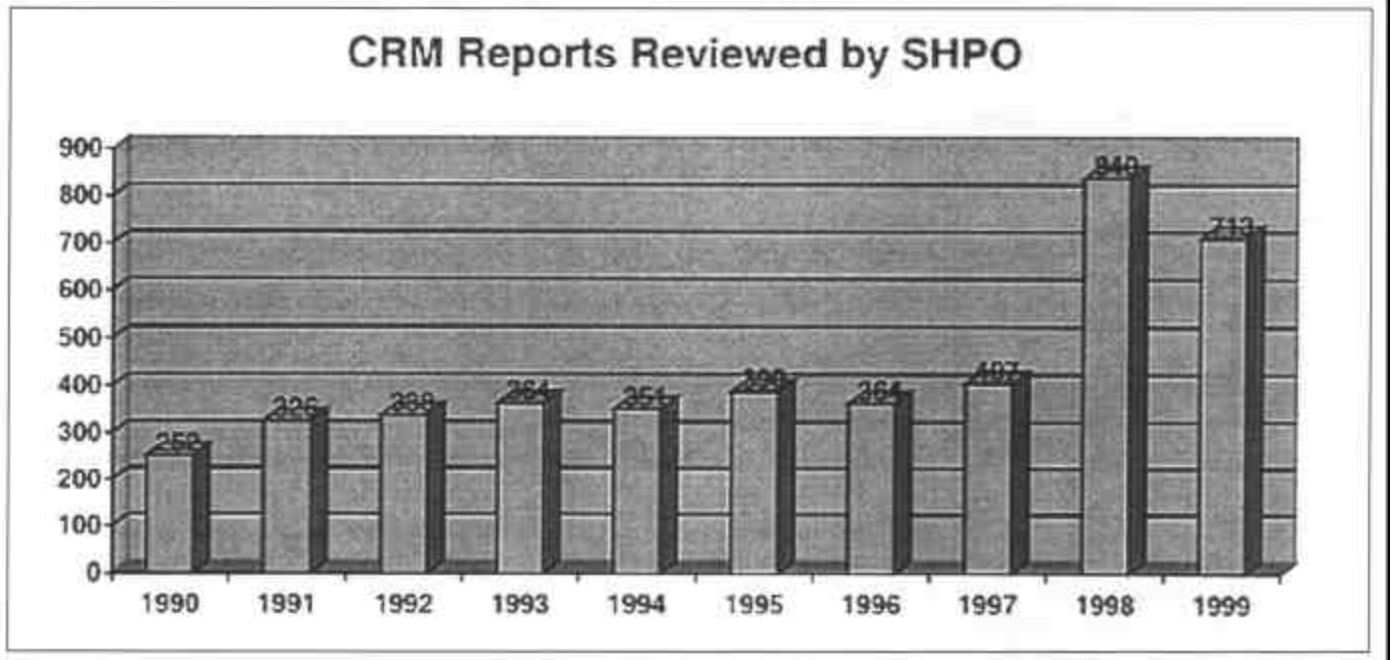


Figure 4. Archaeological survey reports received by the SHPO for FFY 1990 through FFY 1999.

The distribution of archaeological survey reports by type is provided in Figure 5 for FFY 1996 through 1999. Phase IA reports are pre-reconnaissance reports that include a literature search and sensitivity assessment for a project area. The goal of a Phase IA report is to determine whether or not a particular project area has the potential to contain an archaeological site or sites. Phase IB reports are reconnaissance reports that include subsurface testing of a project area. The goal of the Phase IB survey is to physically test a project area in order to determine the presence or absence of archaeological sites. IA's and IB's are usually submitted as a single report; however, they are occasionally prepared and submitted successively. If a site is identified as a result of the Phase IA/B investigations, a Phase II excavation may be conducted to gather more information about the site. The Phase II report should provide sufficient information about the size, integrity, and significance of the site so that the SHPO can determine if the site meets the criteria of eligibility for listing on the State and National Registers of Historic Places. Phase III reports are data recovery or data retrieval reports that present the results of intensive excavations of State or National Register-eligible sites that will be wholly or partially destroyed by development projects. The goal of Phase III excavations is to mitigate this loss by recovering information about the site before the development project proceeds. Phase III projects involve the most thorough excavation, analysis, and reporting of a site and are expected to make a significant contribution to knowledge.

The amount of Phase IB surveyed acreage reported to the SHPO can vary dramatically from year to year. During

the last decade it ranged from a low of 2,223 acres in 1994 to a high of 32,928 acres in 1998. Over the ten-year period from FFY 1990 through 1999 the average yearly acreage surveyed was 14,958 acres, 149,580 acres, or 233.7 square miles, were surveyed in this decade. This is an area about the size of Putnam County, one of the smallest of New York's 62 counties, representing 0.511c of New York State's 49,576 square miles.

Figure 6 presents the number of new archaeological sites reported to the SHPO over the last 10 federal fiscal years as a result of archaeological surveys in the state. 3,436 sites were reported during the decade, increasing the New York statewide inventory of archaeological sites by 30 percent and bringing the end-of-FFY 1999 total of archaeological sites in the inventory to 14,809. This is a significant increase which illustrates how pervasive archaeological sites are across the landscape, and justifies the need for ongoing survey efforts. Based upon survey coverage over the course of this decade, one previously unknown archaeological site was discovered for every 43.5 acres surveyed. This also suggests that the various survey methodologies and field techniques currently employed in New York State are relatively successful at identifying archaeological sites.

During the consultation process the SHPO works with state and federal agencies and local municipalities to try to protect and preserve archaeological sites through project avoidance. Project redesign to avoid sites is quite common and often easy to accomplish. On linear projects like

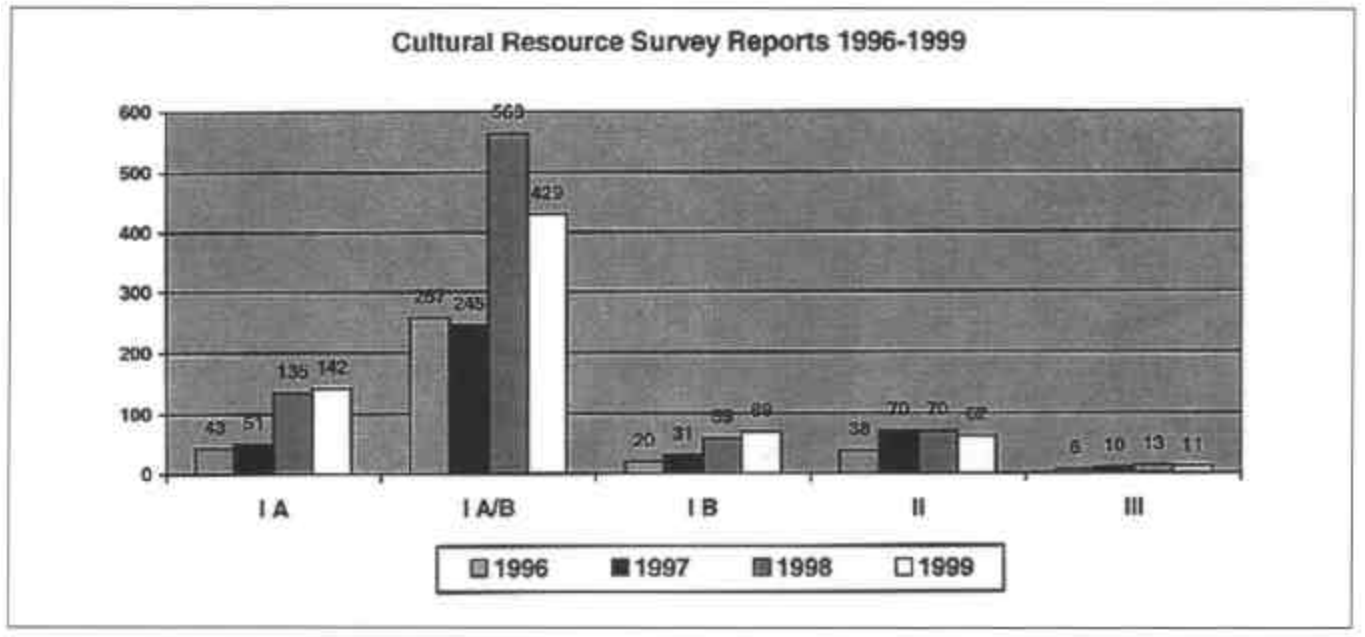


Figure 5. The distribution of archaeological survey reports by phase for FFY 1990 through FFY 1999.

pipelines, transmission lines, or road projects there are often no impediments to going around a site. For projects like housing subdivisions, commercial developments, or industrial parks, identified sites are often avoided by including them in the dedicated green space so often required for such projects. In addition to simplicity, other reasons why sites are often avoided include the agency or developer's legitimate desire to preserve the site and also the desire to avoid the expense of additional Phase II and III archaeological investigations. Unfortunately, the New York SHPO does not record statistics on sites that were avoided at the Phase I level. Anecdotally, the SHPO is constantly engaged in these types of project consultations, and dozens and dozens of sites are protected by avoidance each year.

Phase II investigations are conducted when a formal determination of site significance is needed. The SHPO typically reviews between 25 and 70 Phase II archaeological survey reports each year and issues formal Determinations of Eligibility (DOE) for individual archaeological sites based on the results of this work. A DOE is a written statement that presents an evaluation as to whether or not an archaeological site meets the criteria for listing on the State and National Registers of Historic Places. For example, in 1998 and 1999 the SHPO evaluated 132 archaeological sites based upon Phase II report results. Sixty-five sites were determined to be eligible for the Registers and 67 sites were determined to be not eligible. As these statistics would indicate, there are many archaeological sites that do not meet the established criteria of eligibility for the Registers. The most common reasons why

sites are determined not eligible include lack of integrity (site disturbance) and/or a paucity of archaeological remains.

Sites that meet the State and National Register eligibility criteria receive legal protection under the State and National Historic Preservation Acts. Through a formal consultation process with the SHPO, these sites are typically either protected through project redesign and avoidance, or mitigated through the implementation of a Phase II data recovery excavation. Between FFY 1991 and 1999, the SHPO determined 375 archaeological sites eligible for the State and National Registers based upon the results of Phase II testing. As such, on average the SHPO determines approximately 42 archaeological sites eligible each year and participates in agency consultation to determine the appropriate treatment of these sites. The consultation process often includes project meetings and negotiations, review and approval of either formal avoidance plans or Phase III data recovery plans, development of conditions to accompany project effect determinations or the drafting of Memoranda of Agreement, on-site inspections during Phase III fieldwork, and review of final reports and curation agreements. Because in each instance this consultation process will determine the fate of a significant archaeological site, it is one of the highest priorities of the SHPO and these projects tend to dominate much of the focus of the office's archaeology program.

Except in unique instances, the SHPO maintains the position that site avoidance is preferable to Phase III data recovery and subsequent site destruction. Site avoidance preserves the site for the future, when archaeological exca-

Table 1. Sites subject to data recovery excavations for which final Phase III reports were received by the SHPO from FFY 1990 through FFY 1999.

Site Name	Site Number	MCD	County	PI	E/MA	LA	TA	EW	MW	LW	CT	18TH	19TH	20TH
Shaker Run #1 Site	A00104.000395	Colonie	Albany	XX				XX						
Shaker Run #4 Site	A00104.000398	Colonie	Albany		XX		XX							
Quackenbush Site	A00140.004468	Albany	Albany										XX	
Schuyler Garden Site	A00140.004479	Albany	Albany									XX	XX	XX
Lizzi #2 Site	A00106.000115	Guilderland	Albany			XX								
Jensen-Black Creek Site	A00308.000015	Belfast	Allegany			XX								
Chenango Point Site	A00740.000556	Binghamton	Broome			XX				XX				
Binghamton Mall Sites	A00740.000556	Binghamton	Broome										XX	
Harvey Justice Site	A00740.000621	Binghamton	Broome										XX	
Boland Site	A00707.000059	Fenton	Broome							XX	XX			
Indeck Site	A00708.000045	Kirkwood	Broome			XX	XX	XX						
Richard Anderson #1 Site	A01316.000013	Kiantone	Chautauqua	XX		XX		XX		XX				
Thomas/Luckey Site	A01501.000001	Ashland	Chemung							XX				
Airport Site	A01711.000094	N. Norwich	Chenango			XX	XX		XX	XX				
Porter Site	A01704.000047	Coventry	Chenango										XX	XX
Lower Saranac Hydro Site	A01912.000034	Plattsburgh	Clinton		XX	XX		XX	XX	XX				
IGTS Site 211-1-1	A02106.000111	Clermont	Columbia					XX	XX	XX	XX			
IGTS Site 198-1-1	A02111.000038	Greenport	Columbia			XX	XX	XX	XX	XX				
IGTS Site 198-3-1/3-2	A02111.041-042	Greenport	Columbia											
IGTS Site 199-3-1	A02111.000045	Greenport	Columbia			XX	XX		XX	XX				
IGTS Site 199-3-2	A02111.000046	Greenport	Columbia				XX							
IGTS Site 199-6-1	A02111.000049	Greenport	Columbia			XX	XX							
IGTS Site 199-9-1	A02111.000051	Greenport	Columbia			XX								
IGTS Site 199-11-1	A02111.000056	Greenport	Columbia										XX	XX
IGTS Site 210-1-1	A02114.000057	Livingston	Columbia			XX	XX	XX		XX				
IGTS Site 210A-5-1	A02114.000069	Livingston	Columbia			XX	XX		XX	XX				
At-A-Glance Site	A02540.000212	Sidney	Delaware				XX							
Deuel Hollow Site	A02704.000061	Dover	Dutchess			XX	XX							
IGTS Site 246-1-1	A02704.000073	Dover	Dutchess			XX	XX		XX	XX				
IGTS Site 221-1-1	A02709.000011	Milan	Dutchess				XX		XX	XX				
IGTS Site 214A-2-2	A02709.000012	Milan	Dutchess			XX	XX			XX				
Tinklepaugh Site	A02709.000016	Milan	Dutchess										XX	
Brandts Farm #1 Site	A02705.000034	East Fishkill	Dutchess						XX	XX				
IGTS Site 230-3-1	A02713.000029	Pleasant Valley	Dutchess		XX		XX		XX	XX				
Elmendorph Inn Site	A02749.000056	Red Hook	Dutchess									XX	XX	XX
Centre House Tavern Site	A02902.000077	Amherst	Erie										XX	XX
Brompton 2 Site	A02902.000082	Amherst	Erie							XX				
Willow Ridge Site	A02902.000094	Amherst	Erie						XX					

Table 1. Continued

Site Name	Site Number	MCD	County	PI	E/MA	LA	TA	EW	MW	LW	CT	18TH	19TH	20TH
Martin Phillips Site	A02940.019633	Buffalo	Erie										XX	
Floss Site	A02907.000025	Clarence	Erie							XX				
Rhodes #5 Site	A02907.000031	Clarence	Erie						XX					
Spaulding Lake Site	A02907.000032	Clarence	Erie							XX				
Rhodes Farm Site	A02907.000043	Clarence	Erie			XX	XX	XX		XX				
Piestrak Site	A02907.000048	Clarence	Erie							XX				
Weaver Site	A02914.000049	Grand Island	Erie	XX		XX	XX	XX						
Johnson Pottery Site	A02919.000011	Newstead	Erie										XX	
Don Smith Site	A02921.000012	Orchard Park	Erie					XX						
Forest Creek 4 Site	A02921.000046	Orchard Park	Erie					XX						
Grenadier's Redoubt Site	A03102.000162	Crown Point	Essex			XX				XX		XX		
Soldier's Hut Sites	A03102.000164	Crown Point	Essex									XX		
Arc Site	A03710.000009	Oakfield	Genesee	XX		XX	XX	XX	XX	XX				
IGTS Site 191-1-3	A03902.000043	Athens	Greene			XX	XX		XX	XX				
IGTS Site 191-2-1	A03902.000044	Athens	Greene			XX	XX	XX	XX	XX				
IGTS Site 193-2-2	A03902.000048	Athens	Greene				XX		XX	XX				
IGTS Site 193-3-1	A03902.000049	Athens	Greene		XX	XX	XX			XX		XX	XX	
IGTS Site 194-3-1	A03902.000066	Athens	Greene		XX	XX		XX		XX				
Bush Site	A03902.000068	Athens	Greene			XX	XX	XX		XX				
Murder Kill Site	A03902.000069	Athens	Greene			XX	XX		XX					
Waterfall Site	A03902.000212	Athens	Greene			XX	XX		XX	XX				
IGTS Site 196-7-2	A03942.000591	Athens	Greene				XX							
IGTS Site 130-10-1	A04309.000040	Manheim	Herkimer			XX	XX		XX					
Wertheimer Site	A04545.000026	Black River	Jefferson			XX				XX				
David Beaman Farm Site	A04503.000007	Antwerp	Jefferson										XX	
LeRay Mansion Site	A04511.000001	LeRay	Jefferson										XX	
French/Victor Cooper Site	A04511.000045	LeRay	Jefferson										XX	XX
Camp Drum #1 Site	A04511.000337	LeRay	Jefferson							XX				
Site FDP 1015	A04521.000114	Wilna	Jefferson			XX			XX					
Bishop Mugavero Site	A04701.000508	Brooklyn	Kings										XX	
Atlantic Terminal Site	A04701.013923	Brooklyn	Kings										XX	
Metrotech Site	A04701.015112	Brooklyn	Kings										XX	
Triphammer Forge Site	A05540.000014	Rochester	Monroe										XX	
Site at 19 Madison Street	B05540.002685	Rochester	Monroe										XX	XX
Assay Block 35 Site	A06101.001284	Manhattan	New York									XX	XX	
Schermerhorn Row Site	A06101.006763	Manhattan	New York									XX	XX	
Governors Island Burials	A06101.007420	Manhattan	New York									XX	XX	
Rainbow Plaza Sites	A06340.237-239	Niagara Falls	Niagara										XX	

Table 1. Continued

Site Name	Site Number	MCD	County	PI	E/MA	LA	TA	EW	MW	LW	CT	18TH	19TH	20TH
Jackson Street Burials	A06308.000073	Porter	Niagara								XX	XX	XX	
Crego Site	A06719.000005	Van Buren	Onondaga			XX		XX		XX	XX			
Zinselmeier No. 1 Site	A06915.000016	Victor	Ontario	XX	XX	XX	XX	XX	XX	XX				
McVicker Terrace Site	A06915.000018	Victor	Ontario			XX	XX	XX		XX				
ORGO-08F Site	A07106.000008	Goshen	Orange			XX								
Al Turi Landfill Site B	A07106.000077	Goshen	Orange		XX	XX	XX		XX					
North Walden Site	A07112.000054	Montgomery	Orange			XX								
Stony Lonesome II Sites	A07109.923-939	Highlands	Orange									XX		
Queensboro Iron Works	A07109.000945	Highlands	Orange									XX	XX	
Gillman Site	A07117.000083	Wallkill	Orange		XX	XX	XX	XX						
Civil War Workers Sites	A07942.000001	Cold Spring	Putnam									XX	XX	
Rosebud Site #1	A07903.000025	Patterson	Putnam			XX	XX	XX		XX				
Rosebud Site #2	A07903.000026	Patterson	Putnam			XX								
Nassau Aqueduct Site	A08101.000091	Nassau	Queens											XX
Goldkrest Site	A08303.000050	East Greenbush	Rensselaer						XX	XX				
Conference House Site	B08501.001286	Staten Island	Richmond							XX		XX		
Pedro House Lot Site	A08501.002264	Staten Island	Richmond											XX
P.S. 56R Site	A08501.002569	Staten Island	Richmond					XX	XX	XX				
Minisceongo #1 Site	A08704.000055	Ramapo	Rockland		XX	XX	XX							
Schoharie Outfall Site	A09544.000046	Schoharie	Schoharie					XX	XX	XX				
Lehman Family Cemetery	A09514.000011	Sharon	Schoharie										XX	
Stony Creek 2 Site	A09103.000167	Clifton Park	Saratoga						XX					
Kilmer Farm Site	A09112.000013	Milton	Saratoga										XX	XX
Gasification Works Site	A09140.000970	Saratoga Springs	Saratoga										XX	XX
Glens Falls Dam	A09143.000001	S. Glens Falls	Saratoga											XX
Waterford CSO Sites	A09145.571-574	Waterford	Saratoga						XX	XX				
Peebles Island Site	A09118.000207	Waterford	Saratoga			XX				XX		XX	XX	
Brownsey Site	A09303.000156	Niskayuna	Schenectady			XX	XX	XX	XX					
Eagles Nest Site	A10302.001583	Brookhaven	Suffolk			XX	XX	XX	XX	XX				
Prince-Miller Site	A10302.001732	Brookhaven	Suffolk									XX	XX	
Betsey Prince Site	A10302.001733	Brookhaven	Suffolk									XX	XX	
Route 112 Site	A10302.001713	Brookhaven	Suffolk			XX								
Van Der Kolk Site	A10302.001714	Brookhaven	Suffolk			XX	XX		XX	XX				
McCauley/Cedar Dr. Site	A10302.001736	Brookhaven	Suffolk			XX				XX				
Carroll Site	A10303.000337	East Hampton	Suffolk			XX	XX		XX	XX		XX		
Rockhill Site	A10303.000374	East Hampton	Suffolk							XX				
Timber Ridge Site	A10304.000943	Huntington	Suffolk								XX			
Marion Carli Farm Site	A10304.001048	Huntington	Suffolk									XX	XX	

Table 1. Continued

Site Name	Site Number	MCD	County	PI	E/MA	LA	TA	EW	MW	LW	CT	18TH	19TH	20TH
Courthouse Annex Site	A10740.000491	Owego	Tioga			XX	XX					XX	XX	
Business Park Site	A11140.000749	Kingston	Ulster				XX							
Birch Avenue Site	A11302.000018	Lake George	Warren									XX		
Little Wood Creek Site	A11542.000074	Fort Edward	Washington				XX			XX		XX		
Jay Potting Shed Site	B11901.000017	Bedford	Westchester										XX	XX
Twin Lake Farms #3 Site	A11901.000257	Bedford	Westchester			XX	XX							
Little Lake #2 Site	A11902.000014	Cortlandt	Westchester			XX								
Wickers Creek Site	A11954.000012	Dobbs Ferry	Westchester			XX	XX	XX						
Davenport Park Site	A11942.000318	New Rochelle	Westchester			XX	XX		XX	XX				
Townsend Site	A11910.000062	North Castle	Westchester			XX	XX							
Timothy Knapp Site	A11949.000124	Rye	Westchester									XX	XX	XX
Golf Course Site #1	A11917.000093	Somers	Westchester		XX	XX	XX		XX	XX				
Golf Course Site #2	A11917.000094	Somers	Westchester			XX	XX							
Primrose Site	A11917.000102	Somers	Westchester			XX	XX			XX				
Woodland Viaduct Site	A11943.000766	White Plains	Westchester										XX	XX
Totals				5	11	57	47	25	33	51	5	22	39	13

KEY

- MCD- Minor Civil Division
 PI- PaleoIndian Period
 E/MA- Early and Middle Archaic Periods
 LA- Later Archaic Period
 TA- Transitional Period
 EW- Early Woodland Period
 MW- Middle Woodland Period
 LW- Late Woodland Period
 CT- Contact Period (Late 16th and 17th centuries)
 18th- Eighteenth Century
 19th- Nineteenth Century
 20th- Twentieth Century

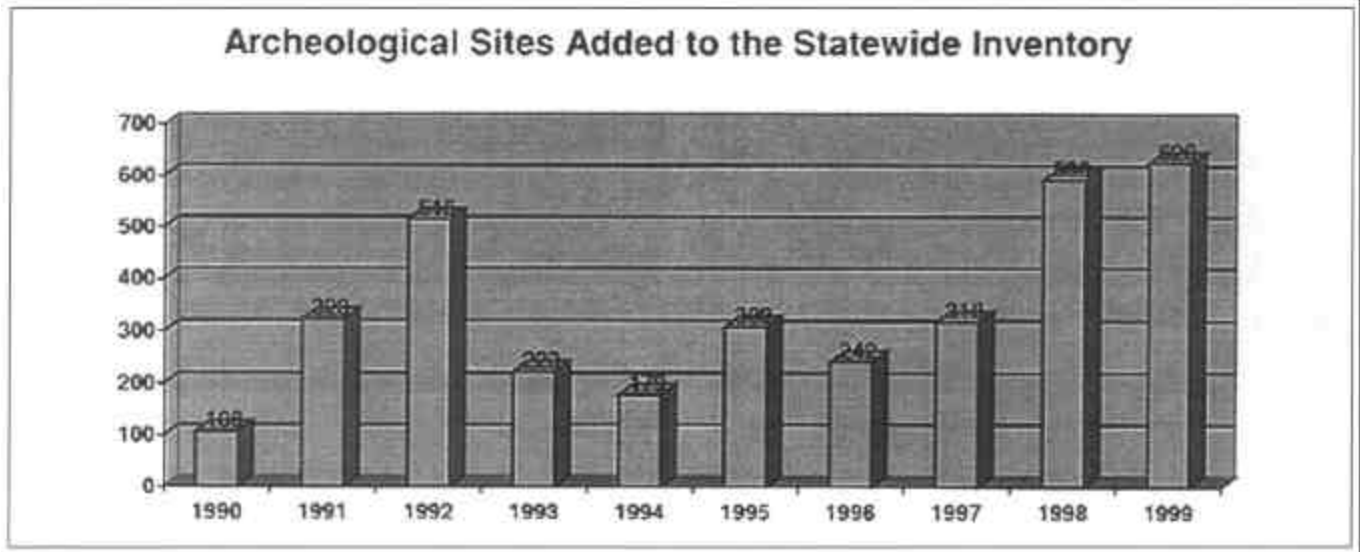


Figure 6. The number of new archaeological sites reported to the SHPO for FFY 1990 through FFY 1999.

vation techniques may be better than they are today and more expansive excavations may be undertaken than are typically conducted as part of data recovery. For this reason, and for other reasons already discussed above, most sites that are determined eligible are typically avoided through project redesign and the development of an appropriate avoidance plan. However, it is also often the case that there is no way to avoid impacts to a site even after prudent and feasible alternatives have been explored. In these instances, Phase III data recovery excavations are acceptable and appropriate.

From FFY 1990 through FFY 1999 the SHPO reviewed data recovery reports for Phase III excavations conducted on 129 archaeological sites. A list of these sites is included in Table 1. It is important to note that final Phase III reports are typically submitted a year or more after the field excavations are completed. Therefore, Table 1 includes a number of sites from mitigation projects largely conducted during the late 1980s, whose final reports were not submitted until 1990 or later. Likewise, many Phase III excavations completed in 1997, 1998 and 1999 are not included in the list because the final reports remain to be completed and submitted to the SHPO.

In one sense, Table 1 documents the on-going loss of sites from New York's archaeological record over the past decade, since almost all of these sites have now been either partially or wholly destroyed as a result of development projects. Although SHPO activities have led to the protection of more sites than have been lost, this destruction is significant when it is remembered that our archaeological record is a non-renewable resource. The number of archaeological sites in our state is finite and as the number of sites lost to development increases over the years, the

responsibility to protect and preserve the remaining inventory increases as well.

Fortunately, data recovery excavations were completed on all of the sites in Table 1, so significant information from these sites has been recovered and preserved. The percent age of each site excavated varies widely from project to project. On some small sites as much as 90 percent of the site has been excavated as a result of combined Phase I, II and III work, but on a number of large sites the mitigation consisted of no more than 1 to 3 percent. Excavation of 5 to 10 percent is more the norm for Phase III work and the goal, in every instance, is the recovery of a representative sample from the site.

Table 1 lists the time periods represented by each site as identified by the authors of the Phase III reports. Abstracts for these Phase III sites are also available through the New York Archaeological Council, and can be used as a guide to the contents of the reports (NYAC 1993-2000). Virtually every prehistoric cultural period and phase is represented in this body of work. While multi-component sites predominate, there are a number of important single component sites as well. A wide range of property types are represented including prehistoric villages, hamlets, campsites, hunting camps, seasonal base camps, quarries, workshops, reduction sites, rockshelters, shell middens and Native American burials. Historic period sites are equally well represented and include a remarkable diversity of property types including urban and rural domestic sites, farmsteads, taverns/saloons, boarding houses/hotels/inns, mansions/estate complexes, African-American sites, gardens and greenhouses, military sites including housing, gun testing facilities, fortifications, trenches, and military burials, commercial/industrial sites including potteries, forges.

iron works, gasification works, pumping stations, aqueducts, and railroad-related sites, and individual Euroamerican burials and family cemeteries. This work represents a significant contribution to the body of scientific knowledge on New York's prehistoric and historic past, and in every instance it represents information that would have been lost or destroyed if it had not been captured in advance of the proposed development project.

Conclusions

The daily activities of the SHPO are dominated by the review of individual projects in compliance with the NHPA, SHPA, or SEQRA. The number of projects reviewed each year is voluminous. Some are simple and easily resolved. Others are complex and raise significant procedural, methodological, and even philosophical issues. In hindsight, some are seen as successes and others as failures. But collectively, the contributions of the regulatory Program administered by the SHPO are substantial. Over the course of the last ten years, tens of thousands of acres have been surveyed, leading to the identification of thousands of new archaeological sites. Hundreds of sites have been saved from destruction through project redesign, preserving New York's rich archaeological heritage for the future. Those that could not be saved received Phase III investigations to record and recover the information about to be lost. Much of this data recovery has added important new knowledge about our

past history and prehistory in New York state. It is unfortunate that there is not sufficient space in this brief paper to highlight some of the exceptional excavations conducted at these Phase III sites, for in many cases the results of this work require rewriting the textbooks of New York state history and archaeology. Hopefully, the list included here will at least provide a guide for the future authors of such works.

Acknowledgements

I would like to thank the archaeology staff of the New York SHPO, including Cynthia Blakemore, Douglas Mackey, and Jennifer Garofalini, for their important contributions to this work.

References Cited

- | | |
|-------------------|---|
| NYAC
1993-2000 | NYAC ABSTRACTS. NYAC
Publications Committee Project,
Volumes 1-6. The New York
Archaeological Council. |
| NYAC
1994 | Standards for Cultural Resource
Investigations and the Curation of
Archaeological Collections in New York
State. The New York Archaeological
Council. |

The Goes/Van Derzee Farm Site, Albany County, Bethlehem, New York

Floyd I. Brewer, Van Epps-Hartley Chapter, NYSAA, Bethlehem Archaeology Laboratory

Situated on the west bank of the Hudson River near the confluence of the Vroman Kill and the Hudson and some 12 km south of Albany, the Goes Van Derzee Farm Site yielded evidence of many Indian cultures dating from 6500 B.C. Analysis of the lithic collection suggests that relatively few Indians lived at the site during the Vergennes and Vosburg phases through 3500-2500 B.C., but that larger groups and/or more regular occupation occurred during the Sylvan Lake, River, and Orient phases between 2500 and 1000 B.C. The evidence suggests that the occupants of the site lived in small wigwams or open-faced shelters primarily during the late spring, summer and early fall seasons. The long history of the site is amply illustrated by finds such as: an abundance of fire-cracked rock, a Brewerton tool-making station, several Owasco skeletons, projectile points ranging from bifurcates to Levannas, and many fragments of Mahican pottery. Although it is generally believed that the Mahicans were routed from the area after a major battle in 1628, documentary evidence shows that Aepje, chief of the Mahicans, sold land near this site to colony director Johan B. van Rensselaer on September 12, 1652.

Introduction

In June 1983, while members of the Bethlehem Archaeology Group were digging on the Nicoll-Sill estate, they were approached by William Goes who cultivated an adjacent farm owned by Pieter Van Derzee. He told them that he had been picking up Indian stone tools over the last thirty years on a ridge about 175 m south of the Nicoll-Sill home. He subsequently showed the group about 600 items in his collection, ranging from hammerstones and gouges, to pestles and a variety of projectile points.

When the collection was shown to William A. Ritchie, former New York State Archaeologist who lived in Bethlehem, his response was quick and emphatic: "All of this? For heaven's sake, there must be a big site there. I have a notion that if Goes found all this stuff in that field, there could be some pits and sub-surface accumulation" (Ritchie, personal communication December 1983). He identified all of the stone tools and made it clear that the Goes/Van Derzee Farm ridge was a multi-component site where many cultural groups had lived over several thousand years.

Test excavations in late June 1984 by the Bethlehem Archaeology Group produced disappointing,

results: a few projectile points in 1 m test squares, several pottery fragments of European manufacture, a rudimentary impression of the problems to be faced, and considerable doubt about a desirable size for the outer reaches of the grid system. The main research goals were revised and firmed up following the test excavations: 1) to identify the native cultural groups which lived on the Goes/Van Derzee Farm Site over the Centuries; 2) to examine how they lived through the evidence they left behind, including the kind of housing they inhabited; 3) to research and describe the interaction of the latest Indian

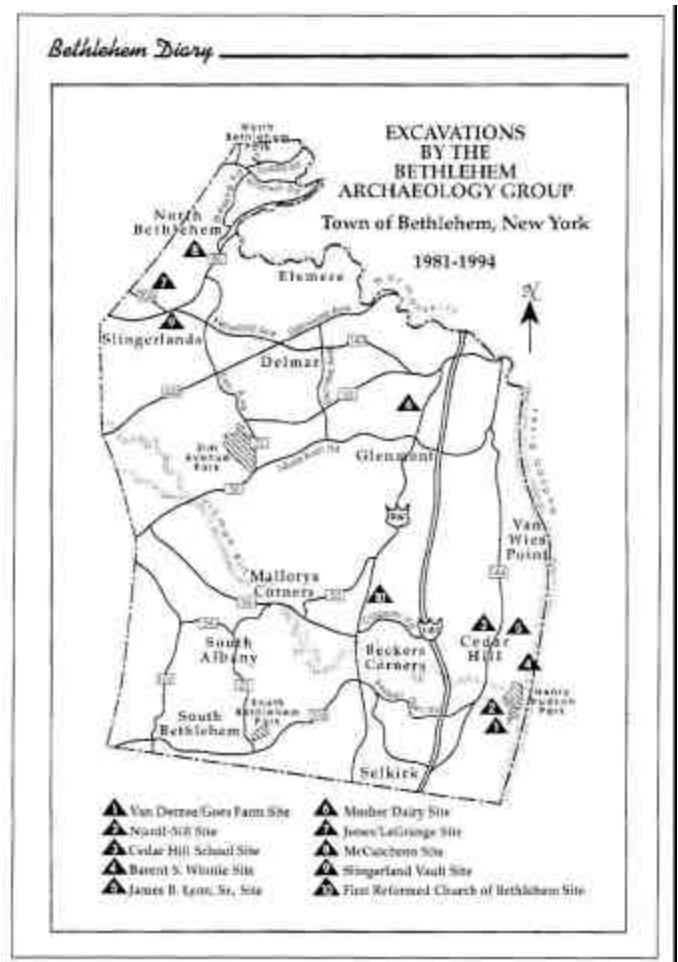


Figure 1. Map of the Town of Bethlehem showing the location of the Goes/Van Derzee Farm Site.

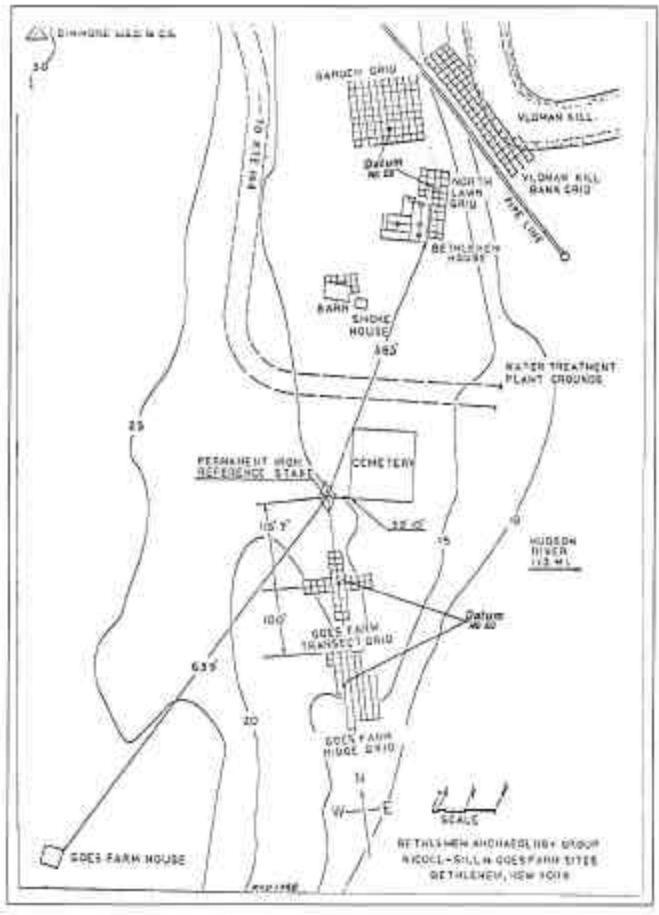


Figure 2 Bethlehem Archaeology Croup Excavations at the Nicoll Sill and Goes/Van Derzee Farm Site, Bethlehem, New York.

group with European settlers, and 4) to complete a site map, charts, and other graphics to illustrate a site report for publication.

The Physiographic and Geologic Background

The Goes/Van Derzee Farm Site is located on the west bank of the Hudson River about 12 km south of Albany in the town of Bethlehem, New York (see Figure 1). The farmer, William M. Goes, lived in a nineteenth-century farmhouse a few dozen meters to the south. His father - Cornelius J. Goes, worked the land after his arrival from the Netherlands in 1928 and Bill carried on the family tradition. The plow zone was rich, mostly because he fertilized it with animal manure every year. The corn he grew on the ridge was highly prized among his customers at farmers' markets in Bethlehem. There is an historic cemetery about 60 m to the north of the site, and a few

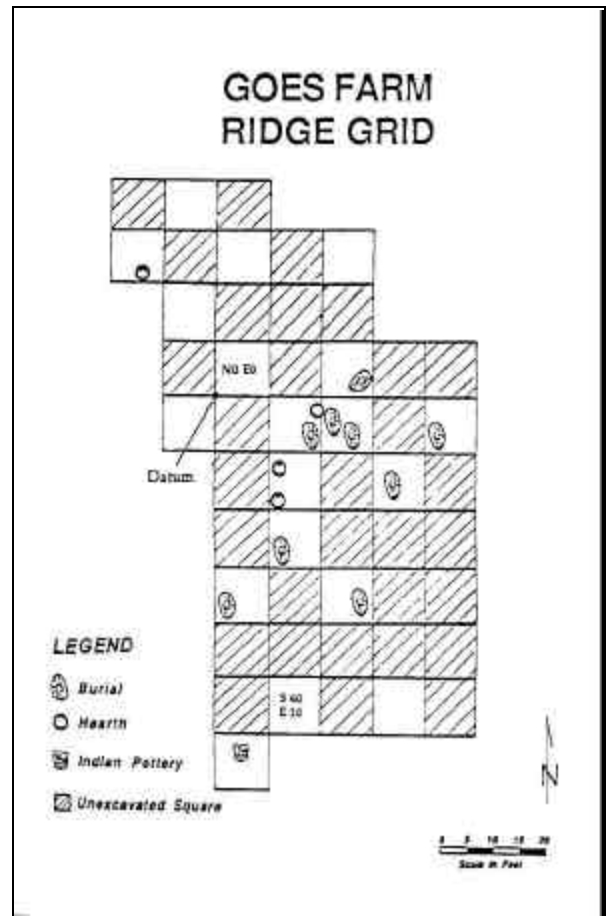


Figure 3. Goes/Van Derzee Farm Site ridge grid, features schematic.

meters beyond the cemetery toward the Vroman Kill is the second oldest extant home in the town of Bethlehem, built by Kilian Van Rensselaer and Elizabeth Salisbury Nicoll in 1735.

The Goes/Van Derzee Farm was part of the Taconic orogeny during the early period in the area's geologic history (Raymo and Raymo 1989:64-65); however, to the untrained eye, there are few land features which can be traced back as much as 500 million years. Of greater relevance to recent conditions on the Goes/Van Derzee Farm Site is a chart which was part of Robert Funk's 1991 essay in honor of the life and work of Louis A. Brennan, whose research on the Early and Middle Archaic in the Lower Hudson Valley is widely appreciated. Selected excerpts are sufficient to describe the enormous impact of the Wisconsin glacier on the land throughout the Hudson Valley and the gradual evolution of flora and fauna:

6000 BP - Sea level about 9 meters below present. Slowing of alluvial deposition along rivers. First significant accumulation of tide marsh peat. Ascendancy of oak-hemlock (C-1 zone) in pollen sequences. A warm, moist period. Oyster beds in Hudson as far north as Poughkeepsie.

8000 BP - Declining rate of sea-level rise. Hudson River channel approaches modern configuration. Dominance of deer, bear, turkey, other Holocene species; increase in nut-bearing trees.

12,000 BP - Glacier recedes north of St. Lawrence Valley; Lake Albany-Vermont drains; isostatic rebound accelerates (virtually no rebound near present mouth of Hudson). Climate moist and cool. Flora of A zone inferred from corresponding levels of wetland deposits. Mostly spruce, fir, pine with some oaks [Funk 1991:52].

Additional study of the literature permitted a description of the geological aspects of the Goes/Van Derzee Farm site intended for the general public:

....about 20,000 years ago, most of New York State was covered by the Wisconsin glacier. Five thousand years later, the glacier had retreated, leaving a huge lake that occupied a large part of the Hudson Valley. It was later called Lake Albany. The lake began to drain about 13,000 years ago as the ice withdrew into present day Canada. Later, park-tundra conditions covered the land - great open spaces followed by spruce and fir forests about 11,000 years ago. At this point the climate was cold and (moist) [Brewer 1993:11].

Excavation Methods

A standard grid of 3 m squares was established in July 1984 (see Figures 2 and 3), which encompassed the entire ridge where the farmer had found most of the stone tools. Using a transit, the grid was set up on a north-south axis and measured from an iron stake driven into the ground about 10m off the southwest corner of the historic cemetery, a fixed point that will never change. Six 1 meter test squares were excavated within the grid system over the following three months.

The test squares showed a consistent pattern: the plow zone was about 30 cm in depth and yellow sand appeared the rest of the way down to an average depth of 1.2 m. Excavators were instructed to use trowels throughout all of

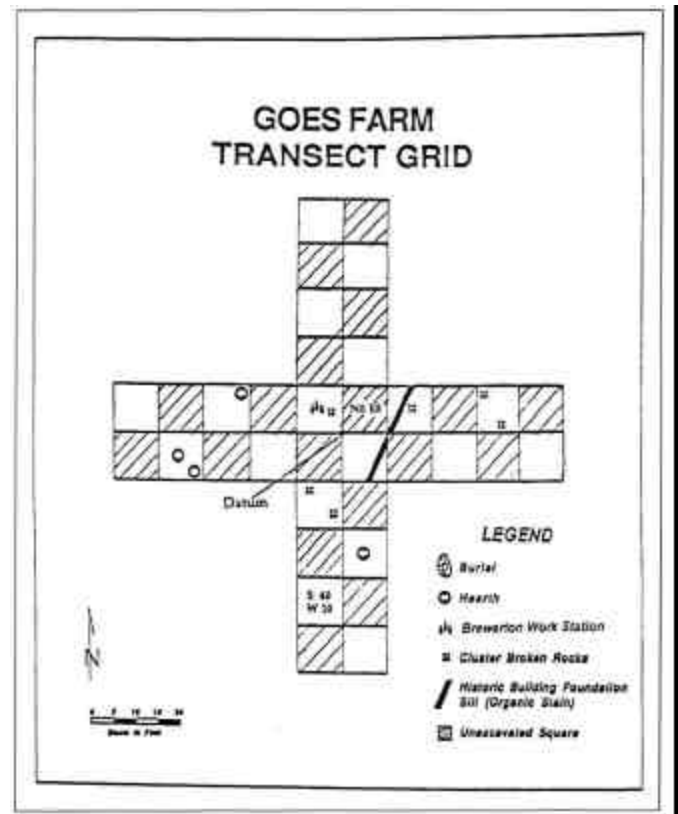


Figure 4. Goes/Van Derzee Farm Site transect grid, features schematic.

the work in the test squares to gain a better understanding of the stratigraphy on the site, the levels at which features were likely to be found, and evidence of post holes or other indications of permanent housing. Because of periodic flooding over the centuries, we reasoned that we probably would not find stratigraphic separation of artifact types and components.

Since no evidence of permanent housing was discovered over three summers of digging, a separate Transect Grid was established in August 1987, due north of the first grid, to enable the crew to sample a much larger area (see Figure 4). Here we used a front-end loader to remove the plow zone, carefully watching the operator of the equipment to be sure he didn't bite into the yellow sand below. Soon thereafter, a mechanical soil sifter was brought to the site to process a huge amount of soil in the plowzone in a short space of time. Since the plan was to close the site early in the fall, this was indeed a necessary step.

Great care was taken to describe all of the artifacts and features in a field notebook, listing the level at which they were found and their exact location in the grid system. The procedure was to wash each artifact in the field, and trace around it (or describe it at length) in the field notebook after each entry, identifying the date, excavator, square, level, and suspected relationships to other finds in the same square and

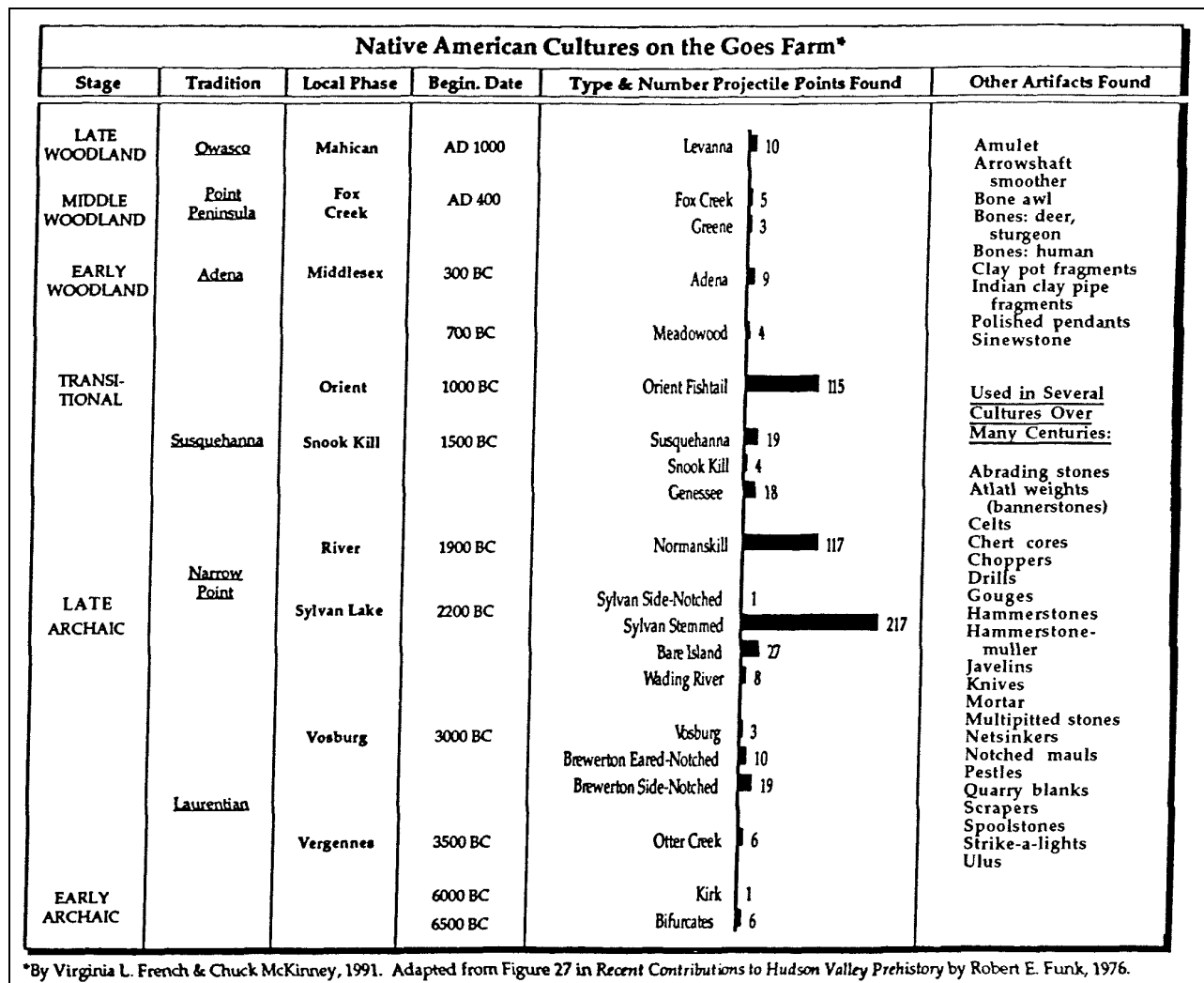


Figure 5. Native American cultures represented on the Goes/Van Derzee Farm Site (Adapted by Virginia L. French and Chuck McKinney [1991] from Funk 1976: Figure 27).

adjacent squares. This took a great deal of time and since this report is being written some ten years later, I am only now fully appreciating all of this detail.

Features were photographed in situ, and extra care was taken to avoid damaging items such as animal bones, human skeletons, and other fragile objects. One human skeleton was removed for a few weeks of study by specialists, but was returned to the exact place it was found and reinterred in the same position: flexed, facing east, with the head pointed south. A precise map of the site was made in 1987 with measurements that show its proximity to the 1735 Nicoll-Sill residence and the colonial cemetery a few dozen meters to the north (Figure 2).

Features

A total of eight hearths were uncovered in the layer of sand immediately below the plow zone in both grids, most containing some charcoal and occasional deer bones (Figures 3 and 4). All of these features were found in undisturbed soil, an average of 36 cm below the Surface. One interesting feature in the Transsect Grid was observed in the sand slightly below the plow zone: a huge pile of chert chips and five near-perfect Brewerton projectile points at the edge of the pile, proof, in our view, of a Vosburg presence in Bethlehem between 3000 and 2500 B.C. (Figure 4).

Nine skeletons were uncovered periodically over the four summers of excavations (Figure 3). Although no projectile points were found with the skeletons, Dr. Ritchie reviewed all of the evidence available through the fifth skele-

ton and concluded that "they are probably Owasco, and clearly in the Late Woodland period" (Ritchie, personal communication November 20, 1986). All but one skeleton faced east, heads pointed south, and knees were drawn up toward the chest flexed-style. There were no grave goods in any of the burials.

Artifacts

Projectile Points

Some 602 clearly identifiable projectile points recovered by the farmer and the Bethlehem Archaeology Group in the Goes/Van Derzee collections represent solid evidence of occupations on the site over several thousand years, particularly from 3500 B.C. down through A.D. 1000. Most of the types described here were discussed and illustrated by Ritchie (1971b). They are best understood when the numbers are listed against a backdrop of their position in a chart showing their relationship to stages, traditions, and phases of Indian life in Bethlehem (see Figure 5).

Archaic

Five bifurcates of the Early Archaic period are evidence of Indian visits to this land around 6500 B.C., probably made by hunting parties which camped temporarily at the confluence of the Vroman Kill and Hudson River. Thirty-eight Otter Creek, Brewerton, and Vosburg points suggest a small, Late Archaic Indian presence during the Vergennes/Vosburg phases between 3500 and 2500 B.C. During this period, game killed with these points was probably cooked by dropping heated stones into bark containers, since the Goes/Van Derzee Farm ridge grid was littered with fire-cracked rock. The heaviest occupation of this site may well have occurred during the Sylvan Lake and River phases beginning around 2200 B.C. Two hundred and seventeen Lamoka straight-stemmed and 117 Normanskill points head the list, followed by 1 Sylvan Side-Notched, 27 Bare Island, and 8 Wading River points. The evidence suggests that atlatl weights or bannerstones were used by the Indians after 3000 B.C. to obtain additional velocity with their spears.

Transitional

The relative abundance of large points such as Genesee, Snook Kill, and Susquehanna, some 41 points in all, indicate another period of life on this site, which occurred both before and after 1400 B.C. We wondered about the effectiveness of these large points, especially when we compared them to the lighter, narrow-bladed Normanskill points of the preceding River phase.

One hundred and fifteen Orient Fishtail points in this collection provoked Serious discussions about the life-style of the residents during the Orient phase, which ended around 1000 B.C. We assumed that the Orient Indians on this site had

some connection to the Orient culture on Long Island, described at length by William A. Ritchie (1980:171-178).

Woodland

Despite the low volume of points from the Early, Middle and Late Woodland periods (four Meadowoods, nine Adenas, three Greenes, five Fox Creeks and ten Levanna points), the corollary evidence suggests that there was considerable activity on this site from Middlesex and Fox Creek times through the Owasco/Mahican and European Contact periods. We were short of solid ideas about why so few points were found depicting a period when the main features (hearths, burials) suggested an active site during the Woodland stage. Thus, we began looking beyond our volunteer group for help in summing up the entire body of evidence.

Responding to questions from the laboratory staff in February 1988, New York State Archaeologist Robert Funk fielded all of our questions and offered these conclusions:

The more productive the locality is (in term of food resources), the more frequently people come back over a long period of time. Your site starts about 6500 B.C., then there is a long hiatus we don't fully understand, then you have evidence of Vergennes from 3500 to 3000 B.C, and Vosburg from 3000 to 2500 B.C. The Otter Creek points are typical of Vergennes, the Brewerton points are typical of Vosburg in Eastern New York [Funk 1993:17].

We were well aware that most of the names of local cultural groups came from sites where diagnostic point types were first found, but wondered if the groups that made them were linked together in long-lived cultural traditions just as families today can be traced back for centuries. Dr. Funk continued:

A succession of phases or cultures have been defined for the Hudson Valley, and we have type sites to define these phases. Your evidence shows Vergennes, Vosburg, Sylvan Lake, and River Cultures in the late Archaic period, and Snook Kill, Orient, Middlesex, Fox Creek and Owasco/Mahican cultures in the Transitional and Woodland periods. The Vergennes may be ancestral for the groups that followed [Funk 1993:17].

We wondered why we had found only one Kirk and one Neville point (c. 5400 B.C.). Predictably. Dr. Funk had spent a lot of time thinking about this issue in earlier years:



Figure 6. Goes/Van Derzee Farm Site: representative projectile points. **Top Row** (left to right) Kirk, Bifurcate, Brewerton Eared-Notched, Otter Creek, Brewerton Side-Notched, Vosburg, Wading River, Sylvan Side-Notched, Lamoka Straight-Stemmed, Lamoka Side-Notched, Bare Island; **Bottom Row** (left to right) Normanskill, Snook Kill, Genesee, Orient Fishtail, Adena (bottom), Jack's Reef Corner-Notched, (top), Greene, Steubenville (bottom), Sylvan Side-Notched (top), Madison (bottom), Levanna (top).



Figure 7. Goes/Van Derzee Finn Site: other chipped stone tools. **Top Row** (left to right) 2 ovate knives, River spearpoint, drill, expanded base drill; **Bottom Row** (left to right) 3 Snook Kill strike-a-lights, 2 scrapers, Dry Brook fishtail, pentagonal Susquehanna knife.

The seeming absence or extreme paucity of Early to Middle Archaic remains in upstate New York and New England has continued to perplex archaeologists despite recent geographically scattered finds of such occupations in central Pennsylvania, the Delaware Valley, on Staten Island, and in southern New Hampshire [Funk 1977:21].

Fourteen years later, Funk conceded that some progress had been made in defining Middle Archaic Cultures in New York, "but we have only begun to develop a radiocarbon dated cultural framework for this period and remain largely ignorant of the associated subsistence and settlement patterns" (Funk 1991:16).



Figure 8. Goes/Van Derzee Farm Site: combined hammerstone/muller and mortar.

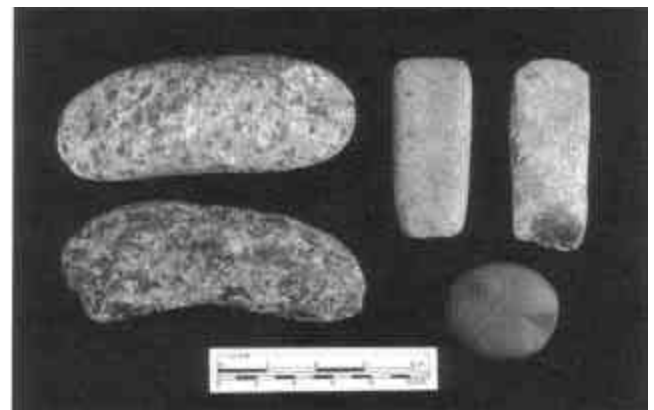


Figure 9. Goes/Van Derzee Farm Site: 2 bannerstone preforms of garnetiferous gneiss, 2 shallow-lipped gouges, and abrading stone (bottom).

Despite considerable controversy, there is still some support for Ritchie's ecologically-oriented hypothesis for the paucity of Early to Middle Archaic remains in New York, which stresses the low carrying capacity of forests dominated by conifers (Ritchie 1971a:2-12). Some six years later, Funk hypothesized that "destruction of old flood plain terraces by the lateral movement of rivers (could have) been a factor." In the same article he called attention to "proposals by other workers (who believe) that relevant artifact styles have been present in the small minority of untyped items in surface collections, or forced into the Procrustean bed of named types" (Funk 1977:24). In addition to projectile points, a variety of other stone artifacts were found somewhere in the vicinity (see Table 1).

Table 1. Summary of Stone Artifacts Other Than Projectile Points

Rough Stone	
Abrading stones	4
Arrowshaft smoother	1
Chopper	1
Hammerstones, bi-pitted	7
Comb. hammerstone/muller	1
Mortar	1
Multipitted stone	1
Netsinkers	9
Notched mauls	2
Pestles	10
Sinewstone	1
Ground Stone	
Bannerstone preforms	2
Celts	6
Gouges	5
Spoolstones	2
Ulus	3
Polished Stone	
Amulet	1
Pendants	3
Chipped Stone	
Chert cores	29
Drills	61
Javelins	7
Knives	135
Scrapers	70
Strike-a-lights	9
Quarry blanks	8

Other Chipped Stone Tools

A variety of bifaces and unifaces were recovered at the Goes/Van Derzee Farm Site by farmers or members of the Bethlehem Archaeology Group, including 135 knives, 61 drills, and 70 side and end scrapers (see Figure 7). All of these were found by either the farmer or volunteers with the Bethlehem Archaeology Group. We understand that a substantial, undetermined number of similar tools were picked up by friends of the farmer over a period of years but we were unable to track all of these private collections.

A prize spearpoint in the Goes/Van Derzee collection crafted by a River phase Indian after 1900 B.C. is a work of art as well as a weapon. Made of greenish-gray Normanskill flint, it is 8.8 mm long and 3.2 mm wide. It has a very sharp point and finely ground, slightly serrated edges (Figure 7). The person who turned out this spearpoint clearly took pride

**Figure 10.** Goes/Van Derzee Farm Site: stone celts.**Figure 11.** Goes/Van Derzee Faint Site: 3 ulus, gouge, spoolstone (bottom).

in his work. He would have used a pebble hammerstone and the percussion method to remove large flake, from a chert core, and probably a deer antler to remove increasingly smaller flakes. The final stage would have involved pressure-flaking in which an antler tine was applied to one area at a time-twisting the wrist to chip off tiny additional flakes.

Named for a site on the Snook Kill in Saratoga County, New York, the Snook Kill people used chert strike-a-lights and the percussion method to create sparks for their fires, a major improvement over the bow drill of earlier centuries. Of the nine Strike-a-lights found on this site, two had squarish bases, similar to Snook Kill points. Some of the end scrapers, such as those in the accompanying photograph, were nicely crafted and comfortable to grasp between thumb and forefinger for such tasks as cleaning fish.

Rough Stone Tools

One muller, seven bipitted hammerstones and one combination hammerstone/muller were recovered on this site. The combined hammerstone/muller and mortar became the focal piece of many exhibitions during the town's bicentennial year

in 1993 (see Figure 8). It is very similar to the one recovered from the Roundtop Site at Endicott, in Broome County, New York (Ritchie and Funk 1973:188, no. 17).

In the eyes of numerous visitors to our laboratory, the 10 long cylindrical pestles used for grinding grain and nuts into food were the most spectacular stone tools of all. One of them was reasonably smooth and about 20 cm in length; the rest were of varying lengths and roughly shaped with many imperfections, like hundreds of similar pestles found at sites in the Northeastern United States.

Two notched mauls, four abrading stones, and two bannerstone preforms added to the picture of rough tools found on the site (see Figure 9). Ground, shallow-lipped gouges are pictured with the abrading stone and bannerstone preforms because all of these tools are likely to have been used by River Indians during the centuries around 1900 B.C. They are almost identical to a bannerstone preform shown in a photograph of artifacts found at the Bent site in Schenectady County, New York, where fragments of the finished product are also pictured (Ritchie 1965: 127, No. 4).



Figure 12. Goes/Van Derzee Farm Site: sinewstone, arrowshaft smoother, bone awl fragments, pebble amulet.

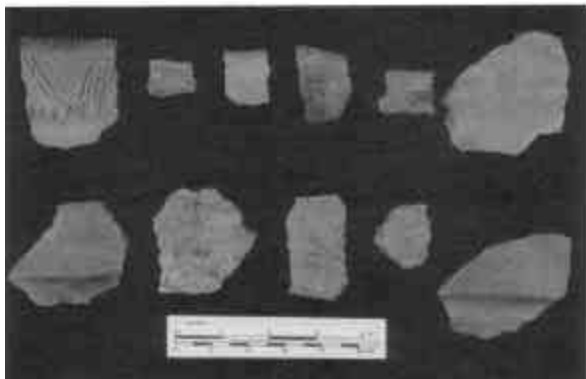


Figure 13. Goes/Van Derzee Farm Site: Native Pottery. **Top** (left to right) Kingston Incised, Vinette Dentate, Owasco Corded Oblique, Owasco Levanna Cord-on-Cord, Castle Creek, and Deowongo Incised. **Bottom** (left to right) Oak Hill Corded, Point Peninsula Corded, Point Peninsula Rocker Stamped, Point Peninsula Dentate Stamped, and Chance.

Ground Stone Tools

Six full or partial ælts were recovered over three summers of intensive digging all nicely ground (Figure 10). One well-formed celt is similar in shape to one found at the Rocky Point Site in Ulster County, New York (Funk 1976: 139, no. 13). Some of the celts are quite sharp and would be effective in cutting wood: none were hafted.

Of the five gouges found on the Goes/Van Derzee Farm Site, only one was ground to perfection, and it is still reasonably sharp after some 4,500 years in the ground. Four shallow-lipped gouges were probably used heavily since they are so dull they would barely be sufficient to remove bark from a birch tree (Figure 9). Additionally, three ulu fragments were found on this site, two of them nicely ground; one with a raised ridge along the top, the other with several notches along the top edge. Drs. Funk and Ritchie examined all of these tools along with a ground spoolstone, and confirmed that the spoolstone, of unknown use, is found only in the Hudson Valley (see Figure 11). Dr. Ritchie suggested that the large gouge, two of the ulus, and the spoolstone could have been made during the Vosburg phase sometime after 3000 B.C. (Ritchie, personal communication November 20, 1986). Similar in shape to modern butcher knives, two of the ulus were sharp enough to skin deer and cut meat, fowl, and fish and would have been useful tools in Vosburg times.

Other Artifacts

The recovery of a sinewstone, an arrowshaft straightener, a perforated amulet, and bone awls were the stimulus for a long debate about functions carried out around the camp. We assumed that Indian women drew strips of animal sinew over the stone again and again to render them more pliable for sewing. Pieces of bone awls were found in the plow zone, and we further assumed that the awls were used to punch holes in deerhides, and bone needles were used with the more pliant sinew strips or basswood fibers to sew sections of hide together. A small, smooth amulet with a hole drilled all the way through the pebble conjured up an image of a young Indian girl wearing the amulet around her neck and working on new arrows for her father by running the sticks back and forth over a stone called an arrowshaft smoother. Of course, these functions could have been carried out by young men. All of these Late Woodland tools, except the bone needle, were found on this site and are shown in the accompanying photograph (see Figure 12).

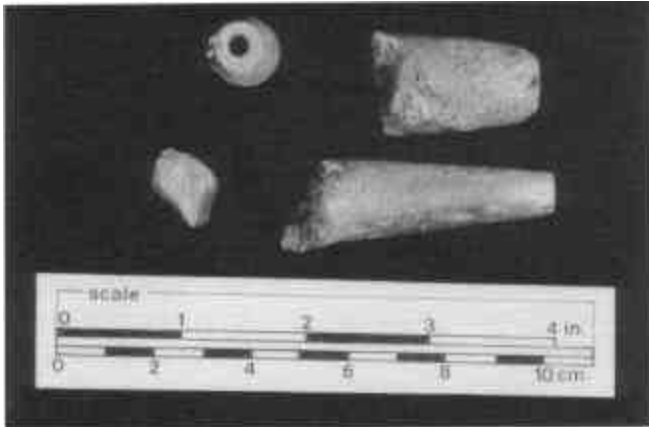


Figure 14. Goes/Van Derzee Farm Site: Native ceramic pipe fragment, (Mahican, c. A.D. 1450).



Figure 15. Goes/Van Derzee Farm Site: Sturgeon bone.

Nature and Source of Selected Stone Tools

Several of the artifacts listed above, such as the amulet, arrowshaft smoother, pestles, two of the ulus, and one of the spoolstones, are made of finely-grained sandstone, commonly found near this site. One of the ulus with several notches along the top, was made of siltstone. However, the sinewstone was made of a better grade of quartz sandstone and we wondered what the source of that stone might be. Still farther afield, the bannerstone preforms made of garnetiferous gneiss were probably recovered around the top of a mountain, and would have required a short journey, possibly to the present day Helderberg Mountains. Similar stone was used to make one of the colts shown second from the left in the accompanying picture. Another Celt, third from the left in the same photograph, was made of soapstone.

Even more questions arose about the origin of the stone from which two of the gouges were made: one from an igneous type of granite filled with feldspar crystals, the other

of rhyolite, a volcanic rock which also contained considerable feldspar. Both are common in eastern Massachusetts and parts of Canada. Were these trade tools? The abrading stone, shown with the gouges and bannerstone preforms in the accompanying picture, was made of good quality sedimentary stone with a heavy quartzite content. Part of a polished pendant piqued the curiosity of Dr. William Kelly, who identified the material in all of these stones. He decided it was made of a Taconic schistose type of metamorphic rock known as phyllite, one of the likeliest trade items in the collection (Kelly, personal communication April 13, 1999).

Pottery and Pipes

Dozens of fragments of native-made pottery turned up in the plow zone during the summers of 1985 and 1986, and the fragments were identified by Drs. Funk and Ritchie during their visit to our laboratory in November 1986. The fragments recovered during the summer of 1987 were identified by Dr. Funk. Following a series of comments about the types of pottery in the collection, he went back over many of the pieces and firmed up his identifications. Later, the laboratory prehistory team reviewed a few of his choices where the audio tape of the meeting left us in doubt. The Point Peninsula Corded fragment was familiar because he had found similar fragments on the Ford Site in Columbia County, New York (Funk 1976:130-131). Point Peninsula Rocker Stamped fragments were found at the same site. Chance Incised, Oak Hill Corded, and Vinette 1 pottery had been recovered from many sites, including the Claverack Rockshelter in the same county (Funk 1976: 120). Additionally, we discovered that several of the same types were found at the Westheimer Site near Schoharie, New York, where Dr. Funk directed excavations beginning in the summer of 1967 (Ritchie and Funk 1973: 131-133). A clump of Owasco Corded Horizontal fragments was found slightly below the plow zone after the accompanying photograph was taken, bringing to twelve the number of types of native pottery found on this site (see Figure 13). All of the fragments, except the Owasco Corded Horizontal feature, were recovered from the plow zone and could not be attributed to a specific square. All told, 347 native pottery fragments were recovered from the plow zone. Some feeble attempts were made to identify all of them following our pottery identification session with Drs. Funk and Ritchie, but it became a daunting task, and we decided to leave this chore to a future scholar. More than one-half of them are body sherds, rendering the identification task especially difficult.

Research on the chronology of native-made ceramic pots in the Northeast shows that our Vinette I pot could have been made before the birth of Christ and probably had a pointed bottom as did our Point Peninsula types (Ritchie, personal

communication December 1983). These pots had constricted necks as did later pots with rounded bases and collars, making it possible to suspend them with thong over a fire. Most of the pottery fragments in this collection were made between A.D. 1300 and 1450.

Only four clay pipe fragments were recovered by the farmer and members of the Bethlehem Archaeology Group (Figure 14). Stories about earlier pipe finds on the site were passed around but we could not track down the fragments. Dr. Ritchie said that the bowl fragment was "the ring bowl type, probably Mahican, A.D. 1400-1500" (personal communication November 20, 1986). A stem fragment was exceptionally thick with a very large bore. During the Late Woodland and Contact periods, it is believed that Indian males both grew the tobacco and smoked the pipes, but left all the remaining gardening to their wives or women of the clan to which they belonged.

Subsistence Remains

Almost all of the bone fragments recovered from around or near hearths through September 1986 were deer according to Dr. Ritchie, and similar bones were found during the final season of digging in 1987 (personal communication, November 20, 1986). Numerous tiny rodent skulls, and possible related bones were recovered in the plowzone, but there is no way to be sure the animals were food sources. In the same vein, dozens of snail shell fragments were found in the plowzone, along with a number of oyster shells. The oyster shells were identified as *Crassostrea virginica* by SUNY Albany biologist Stephen Brown, and are similar to the common shells we know today (personal communication June 19, 1991). Since all of them came from the plowzone, we have no way of knowing whether their contents were consumed by Indians or by later European occupants. Similarly, numerous nutshells were found in the plowzone leaving no way to determine if they were a food source for Indians or later residents.

One definite food source appeared in August 1985 on the top of a Late Woodland hearth—a very fragile, butterfly-shaped bone from the back of a sturgeon (Figure 15), according to Dr. Ritchie (personal communication November 20, 1986). Fortunately, the excavator realized he had reached a possible hearth. He drew a line around a dark stain in the ground and mentioned the bone and associated charcoal fragments to the photographer, who recorded the find on film. An hour of careful digging with a trowel and dental instruments produced an intact sturgeon bone. A well-known subsistence phenomenon in many Hudson Valley River sites, the sturgeon as a food source is best illustrated by the hundreds of sturgeon fragments found at the Tufano Site, about 2 1/2 mi north of Athens in Greene County, New York, where "some of the

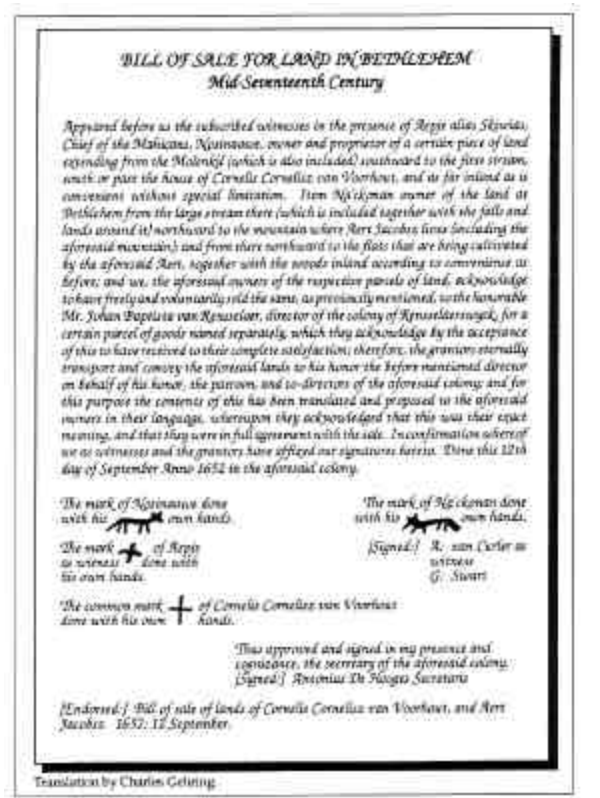


Figure 16. Bill of sale of lands of Cornelis Cornelisz van Voorhout, and Aert Jacob Jacobsz 1652; 12 September (see Breuer 1933:25).

scutes or plates are almost incredibly large, suggesting individuals weighing 100 pounds or over. There are modern species on record, taken from the Hudson River, which weighed 800 pounds" (Funk 1976:89).

Summary and Interpretations

In light of the lengthy analysis of the above evidence for a presentation to the New York State Archaeological Association in April 1990, and eight additional years to mull over final impressions, the following Conclusions are drawn:

- Early Archaic - The evidence (five bifurcates, dating to 6500 B.C.) suggests a brief visit by an early hunting party. Some of the end and side scrapers, hammerstones, choppers, and bifaces found on this site might have been made during the Early Archaic period, but there is no way to be sure since all of them were found in the plowzone. The climate was pretty much like that of today, and members of the early hunting party or parties probably subsisted on a limited variety of small game, nuts, berries, and fish.

- **Middle Archaic** - With only two projectile points (one Stemmed Kirk, and one Neville, both c. 5400 B.C.) which are clearly traceable to the Middle Archaic period, and possibly some of the above mentioned general tools, we concluded that the Goes/Van Derzee Farm Site is no different than most sites in northeastern New York, which saw rare visits by Indians during this time period.
- **Late Archaic** - The 38 Otter Creek, Brewerton, and Vosburg points found on this site indicate an increased level of occupation during the Vergennes and Vosburg phases (3,500 B.C. - 2,500 B.C.). We examined a copy of Dr. Ritchie's "A Culture Sequence and Chronology of New York," (Ritchie 1980: fig. 1 xxx-xxxi) on a number of occasions during the digging phase, particularly after a Brewerton workstation was uncovered in September 1987, and realized that our evidence confirmed an Indian presence in Bethlehem during the Laurentian tradition.
- **Late and Terminal (Transitional) Archaic** - It seemed obvious that the 411 projectile points made during the Sylvan Lake, River, and Snook Kill phases of Indian life between 2,500 B.C. and 1,400 B.C. were solid evidence of a substantial Indian presence in Bethlehem during this time period. Although the Orient culture record is transitional to a later period (Funk 1976:306, fig. 27), most scientists include this evidence with their Terminal Archaic figures. The 115 Orient Fishtail points would bring the Terminal Archaic collection to 526 projectile points, an impressive body of evidence.

The substantial native presence in Bethlehem during these centuries is also supported by the numerous general tools listed in the above chart. Weights (bannerstones) were attached to atlatls or "throwing sticks" tipped with projectile points, and these weapons were thrown at deer and other large game with much greater velocity. Acorns and other seeds were ground into food with a combination hammerstone/muller and mortar. Fishing was important to the subsistence economy and dugout canoes were a basic means of transportation, although no canoe fragments were found on this site. The centers of trees were removed by fire and stone gouges were used to create the canoes. The nine netsinkers in this collection are ample evidence of fishing activity. Basic tools such as choppers, end and side scrapers, hammerstones and knives were used in these centuries as well as in past and future centuries.

Hints of trading activity came with the exotic stone from which the gouges were made: one from igneous rock with feldspar crystals and found in eastern Massachusetts and Canada, the other known as rhyolite from similar rock and also found in eastern Massachusetts and Canada, according to Dr. William Kelly of the New York State Science Service. The stone for two bannerstone

preforms "was recovered high up on a mountain," in his view, and we debated which mountain was near enough to be a logical choice. The Heldehegs? If not, and if the stone came from the Adirondacks, which was his educated guess, this is a likely trade item. Based on his analysis of a photograph, he also believes that one of the celts was made of Adirondack gneiss, but couldn't confirm the choice because this celt was returned to the farmer and later sold to a collector (William Kelly, personal communication April 13, 1999).

- **Early and Middle Woodland** - These periods have been combined here because so little evidence of them was found on the Goes/Van Derzee Farm Site. Recovery of four Meadowood, nine Adena, three Greene and five Fox Creek projectile points dating from 1000 B.C. to c. A.D. 500, along with the pottery of these cultures, suggest limited visits to this area during these centuries. Small numbers of all of these points were also found on the Dennis Site in nearby Menands, New York. (Funk 1976:31, fig. 4) leading us to wonder about ethnological relationships among greater Albany area Indians before and after the birth of Christ. We know that Indians on both sites made similar kinds of pottery (Funk 1976:32) as well as similar points attributable to other time periods.

- **Late Woodland** - While the Levanna points found on this site were small in number (10), other evidence, especially burials, pottery, clay pipes, strike-a-lights, and general stone tools believed to have been used after A.D. 1000, suggest an active presence by Owasco/Mahican Indians through several decades into the Contact period. Twelve different styles of Indian pottery, eleven of them pictured above (see Figure 13).

Table 2. European/American artifacts.

Creamware	45
Delftware	2
Earthenware	10
Green glazed ware	23
Pearlware	56
Porcelain	71
Redware (mostly modern)	359
Stoneware	79
Whiteware/ironstone-graniteware	317
Bottles and household glass	
Assorted fragments	502
Kaolin Clay Pipes	
Largely English, Dutch and German	69
Buttons	
Largely modern	7
Metal Artifacts	
Assorted nails, buckles, hooks, etc.	108

were made by Mahican women between A.D. 1300 and 1450, when agriculture and semi-permanent villages were in vogue. Bone awls were used to punch holes in animal hides and a sinew stone was used to turn pieces of animal sinew or basswood fibers into more pliant strips for sewing pieces of hide together and creating clothing, and footgear. Now the residents were using the bow and arrow to hunt game, and tools such as a stone arrowshaft smoother to fashion their arrows. Strike-a-lights were commonly used to start fires and food was cooked in large ceramic pots suspended with thongs over fires. Burial customs called for the dead to be placed in shallow graves, in a flexed position, facing east, heads pointed south, and without grave goods.

- Contact Period - Although the Mahicans may have been driven out of the area after conflicts with the Iroquois in 1628, some of them were negotiating the sale of land in Bethlehem as late as 1652, about twenty-two years after Brant Peelen. Bethlehem's first European resident, began to farm the land on Westerlo Island (Brewer 1993:34). One such sale shows Aepje (pronounced AP ya), chief of the Mahicans, and two men from his tribe, confirming the sale of land to colony director Johan B. van Rensselaer on September 12, 1652 (Figure 16). Other Bethlehem residents mentioned in the sale are Aert Jacobs, who farmed the land a few hundred meters north of the Goes/Van Derzee Farm Site, and Cornelius van Voorhout, who had a farm in an area now called Glenmont, a hamlet in the town of Bethlehem. The bill of sale is typical of others negotiated in the seventeenth century: vague boundaries and figures of small animals to identify the Indians selling the land. In exchange for the land, the Indians received "a certain parcel of goods named separately" (Brewer 1993:25), a record that could not be located.

Cornelius Hendricksz van Nes first farmed this land in the early 1640s, followed by a succession of farmers, and culminating in the building of an affluent home here in 1733-1735 by Kiliaen van Rensselaer Nicoll and his wife, Elizabeth Salisbury Nicoll. Bits and pieces of more recent artifacts dropped by the descendants of these early families or their servants were recovered by members of the Bethlehem Archaeology Group, along, with the evidence of Indian cultures described above (Table 2).

Acknowledgements

Special thanks are due Virginia French, associate field director of the Goes/Van Derzee Farm Site and a long-term member of the Bethlehem Archaeology Laboratory's prehistory team, known for her careful field notes and outstanding organization of factual information in the laboratory. All of the photographs used in this article were taken by Charles McKinney, who spent long hours in both field and laboratory, and who took on the laborious task of transcribing all of the audio tapes of the prehistory team's meetings with Drs. Ritchie and Funk. Long-term members of the Bethlehem Archaeology Group, particularly regulars such as Roy Dietert, James Engleman, Edward Homiller, Ann Jacobs, and the late Bernard Lamica and Benjamin French, carried out much of the hard work and earned enviable reputations as dedicated volunteers. The scholarship aspects of our work were especially improved and rendered more thorough by William A. Ritchie and Robert E. Funk, who identified most of the artifacts in the laboratory. Dr. Funk offered additional help with drafts of this article.

References Cited

- Brewer, Floyd I.
1993 *Bethlehem Revisited, A Bicentennial Story 1793-1993*. Lane Press of Albany, Albany, New York.
- Funk, Robert E.
1976 *Recent Contributions to Hudson Valley Prehistory*. New York State Museum and Science Service Memoir 22, Albany.
1991 The Middle Archaic in New York, *Journal of Middle Atlantic Archaeology* Vol. 7.
- Funk, Robert E, and Charles F. Hayes III, editors
1977 *Current Perspectives in Northeastern Archaeology*. Researches and Transactions. Vol. 17, No. 1.
- Raymo, Chet and Raymo, Maureen E.
1989 *Written in Stone, A Geological History of the North eastern United States*. The Globe Pequot Press, Old Saybrook, Connecticut.

- Regan, Peter T., Robert H. Fickies, and Robert J. Dineen
1982 *Engineering Geology Classification of Soils of the Albany, New York, 15 Minute Quadrangle*. New York State Museum and Science Service. Map and Chart Series 36, Albany, New York.
- 1982 *Geologic Hazards and Thickness of Overburden of the Albany, New York 15 Minute Quadrangle*. New York Museum and Science Service. Map and Chart Series 36, Albany. New York.
- Ritchie, William A.
1965 *The Archaeology of New York State*. Natural History Press. Garden City. New York.

- 1971a The Archaic in New York. *The Bulletin*, The New York, State Archaeological Association 52: 2-12.
- 1971b *A Typology and Nomenclature for New York, Projectile Points*. Revised edition. New York State Museum Bulletin 384, Albany.
- 1980 *The Archaeology of New York State*. Revised edition. Harbor Hill Books, Harrison. New York.
- Ritchie, William A, and Robert E. Funk
1973 *Aboriginal Settlement Patterns in the Northeast*. New York State Museum and Science Service, Memoir 20. Albany.

Lithic and Ceramic Cross-Mends at the Eaton Site

Roderick B. Salisbury, *Buffalo State College*

Two aspects of the artifact assemblage at the Eaton Site in Western New York are examined. First, in what way and to what extent did extensive plowing affect the integrity of the site context? The data suggest that some important inferences can be made. This allows for the second discussion, regarding behavioral patterns. Distribution maps of ceramic and lithic cross-mends, along with post mold maps are used to study waste streams at Eaton, with several distinct lines of refuse disposal identified. The emphasis of the waste stream analysis is on discovering a pattern in the discard practices for the two artifact types.

Introduction

In order to understand the distribution of artifacts and the effects of disturbance on the context of artifacts at the Eaton Site, I have studied cross-mends of both potsherds and projectile points. This paper describes and compares distributional patterns of cross-mends for these two artifact classes. I discuss the cultural and non-cultural processes that might form the archaeological record at the Eaton Site, and the potential effects of this on future studies of materials from the site. It can be, as Binford puts it, "a very risky business" (1977).

The Eaton Site is a plowed, multi-component site located on a knoll just to the east of Cazenovia Creek in West Seneca, New York. The major component is that of a sixteenth-century Iroquoian village, probably inhabited by a branch of the Erie (White 1971; Engelbrecht 1991, 1994, 1997). This is not the earliest component of the site. Late Archaic and early Woodland artifacts have been recovered (Engelbrecht 1994).

After the Iroquoian habitation, there is no record of use until the area became part of the Buffalo Creek Reservation. In the 1840s it began to be farmed, first by the Ebenezers, a religious group from Germany, and later, as part of the Eaton and Schaub farms. During the late nineteenth and early twentieth centuries, the site was plowed extensively (Engelbrecht 1994). Marian White (1961) estimated the site area to be 2.2 acres based on the size of the knoll. Since the 1960s, the northern and eastern portions of the site have been destroyed.

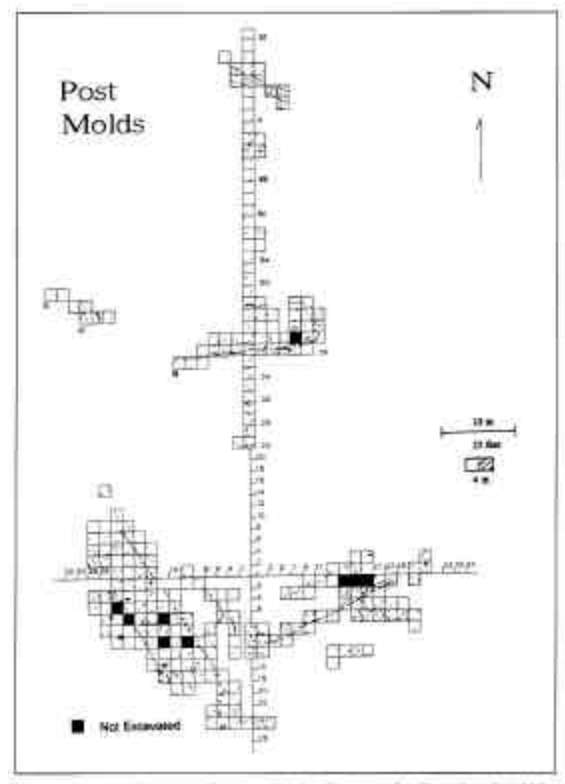


Figure 1. Eaton Site map of post mold distribution (alter Engelbrecht 1997) (Courtesy of William Engelbrecht).

Archaeological Investigations at the Eaton Site

Ongoing excavations at Eaton have yielded an enormous quantity of artifacts, allowing one to study distribution, patterning, and disturbance processes. Both Buffalo State College and SUNY at Buffalo have conducted field schools at the Eaton Site, under the direction of Buffalo State College Professor William Engelbrecht (Engelbrecht 1991, 1994, 1995, 1997). The Houghton Chapter of the New York State Archaeological Association has also conducted excavations here. The artifacts recovered during these activities are curated at Buffalo State College. Marian White had commented on earlier surface collections made around the turn of the century by local amateur archaeologists (1961). The effect of this activity on current excavations will be discussed later.

Several middens have been identified at the Eaton Site (Figure 1). The largest to date is at the south end of the site,

where the land begins to slope down towards the Cazenovia Creek flood plain. A comparison of distribution maps from excavation reports of Buffalo State's field schools shows that this block of units contained large quantities per unit of potsherds, chert flakes, and fire-cracked rock, as well as a considerable quantity of faunal remains. Other middens probably existed along the west side of the site, near the slope down to the creek. Marian White, who mentioned Eaton in her 1961 study of Iroquoian culture, stated that while the banks most likely contained a number of middens at one time, erosion, collectors and "previous careless digging" have removed most traces of them. Hodder (1976) also identifies erosion and "local archaeological interest" as factors determining site integrity.

Excavations at the site in 1995 (Engelbrecht 1995) uncovered an accumulation in an original pit labeled Feature 50 (Figure 1). It encompassed five 2 m by 2 m units in the northern section of the site. Trash filled pits are to be expected because, in Schiffer's words, depressions and pits are "irresistible disposal locations in all settlements" (1987: 61). The excavated portions of this pit contained 991 sherds, 1,890 flakes, 15.5 kg of fire-cracked rock, 1,028.9 g of non-burned bone, 430.6 g of burned bone, 2 point tips, 4 point bases, and assorted other stone tools.

Over the years, numerous studies have been done using artifacts unearthed at the Eaton Site. Most of these have been done in recent years by students of Buffalo State College and the State University at Buffalo. Frequently, these studies have been statistical or comparative in nature. An example is Schwabe's 1997 (Schwabe n.d.) compilation of point tip and base distribution, which I have used for this project. Others, such as Traci Wright's 1993 (Wright n.d.) study of patterns of rimsherd decoration, have discussed possible behavioral correlates, such as matrilocality. There have not, however, been many attempts to determine whether or not behavioral patterns can be inferred from the archaeological remains.

Processes That Transform the Archaeological Record

Gibbon (1984) has said that the information we need to reconstruct ancient socio-cultural systems can be found through archaeology. To interpret that information we must, as Schiffer puts it, study the systems, both natural and cultural, that form the archaeological record (Schiffer 1976). Archaeological remains, he claims, are not a "fossilized culture system," as stated by Binford in 1964, a view supported by others. Rather, they are subjected to and transformed by both cultural and natural processes. It is these processes which need to be explained in order to understand the archaeological record (Schiffer 1976; Binford 1977; Watson 1984). All agree that because we infer past dynamic systems from the remains available to us, we must learn as much as we can about the factors that transform said remains.

Two basic types of processes affect site formation: cultural, which Schiffer (1976) has labeled c-transforms; and non-cultural, or natural, labeled n-transforms. These

"formation processes" can alter the archaeological record by destroying or changing material and patterns, or by adding new material and creating new patterns.

Non-cultural transformation processes are natural, post-depositional changes that affect a site and/or artifacts (Schiffer and Rathje 1973; Schiffer 1976). The time between the abandonment of a site and its burial can, according to Gifford (1975:79), vary widely, allowing time for a number of natural processes to act on it. Ascher (1968) speaks of the process of entropy, where time - progressively reduces the quantity and quality of evidence surviving in the archaeological record." Schiffer (1983) maintains, however, that some inferences can be made from even badly disturbed sites like Eaton.

Natural processes, including disturbance by plants, animals, gravity, rockslides, mudflows, wind, water, frost heave, seismic activity, etc., can cause artifacts to sink, rise, or be

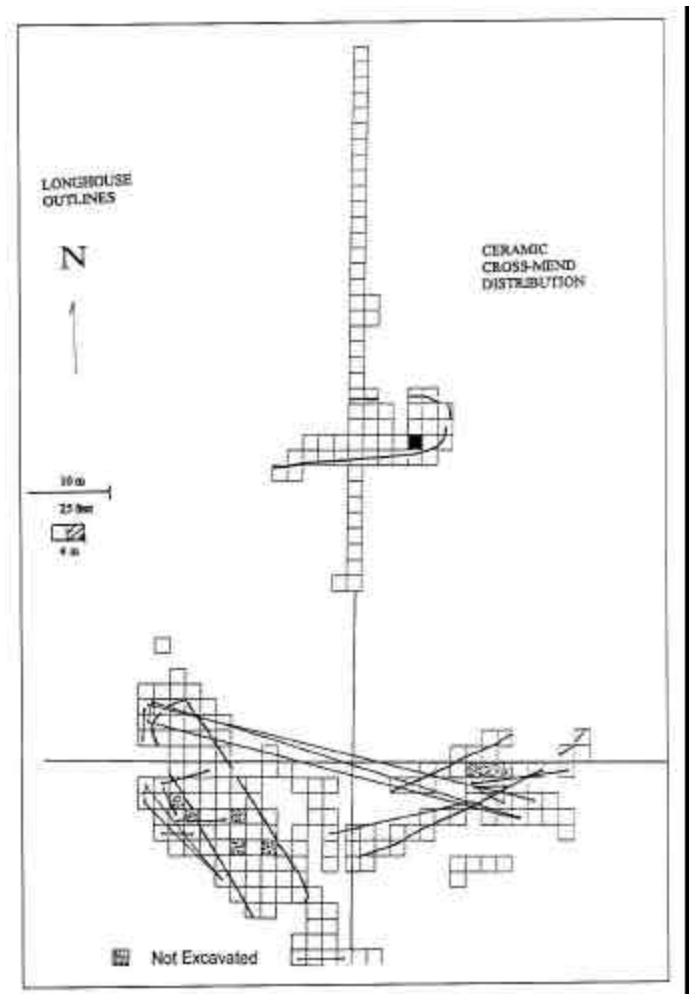


Figure 2. Ceramic cross-mend distribution at the Eaton Site.

layered or otherwise reoriented (Wood and Johnson 1981; Gibbon 1984). For example, treefalls or the action of root systems can cause major rearrangement of artifacts (Gifford 1978), as can burrowing animals (Schiffer 1987). Also, some cultural processes can expose previously protected artifacts to the elements. Faunal remains are especially susceptible to n-transforms (Binford 1977). While this paper is not chiefly concerned with n-transforms, they must have played a role in the formation of the archaeological record at Eaton. This cannot be easily determined, though, due to the past two centuries of farming and construction.

Rather, it is the cultural activities (c-transforms [Schiffer 1976]) that concern us here. These range from the manufacturing, re-use and discard behavior of the original inhabitants of a site, to the plowing or pot hunting done, perhaps years later, by another group. The cycle that items affected by c-transforms undergo can be broken down into five stages: procurement, manufacture, use, maintenance, and discard (Schiffer 1972).

Procurement at Eaton occurred on location for clay, wood, and other building materials, and elsewhere for chert. The large quantity of debitage stands as evidence of tool manufacture and/or maintenance, while samples of utilized flakes and tools with wear patterns are also found in abundance. It is through discard, as well as abandonment, caching behavior, and loss, however, that the archaeological remains are deposited. Schiffer calls this group of processes cultural deposition (1987). After discard, other post-depositional factors, such as scavenging, collecting, pot hunting, excavation, and earth moving begin to affect what we see in our assemblage. These cultural processes can either directly modify the record, or, as previously mentioned, bring artifacts into contact with natural processes (Schiffer 1976; Butzer 1982).

Plotting the Distribution of Ceramic and Lithic CrossMends

Buffalo State's collection contains approximately 26,490 potsherds. Over several years, Houghton Chapter member Kathryn Guest was able to produce 545 mends from these sherds, some consisting of multiple fragments. This study uses only those mends whose parts came from units not immediately adjacent to each other. Such mends are of greater use in determining the effects of post-depositional processes.

After final analysis, 12 fit the requirements. These mends were then plotted on an excavation map of the site (Figure 2). The resulting distribution pattern showed no evidence that it could result from plowing. Engelbrecht (1994) also suggests that the greater density of potsherds outside of longhouses argues for patterning being preserved despite plowing, and this finding agrees with Trubowitz's (1978) work on settlement

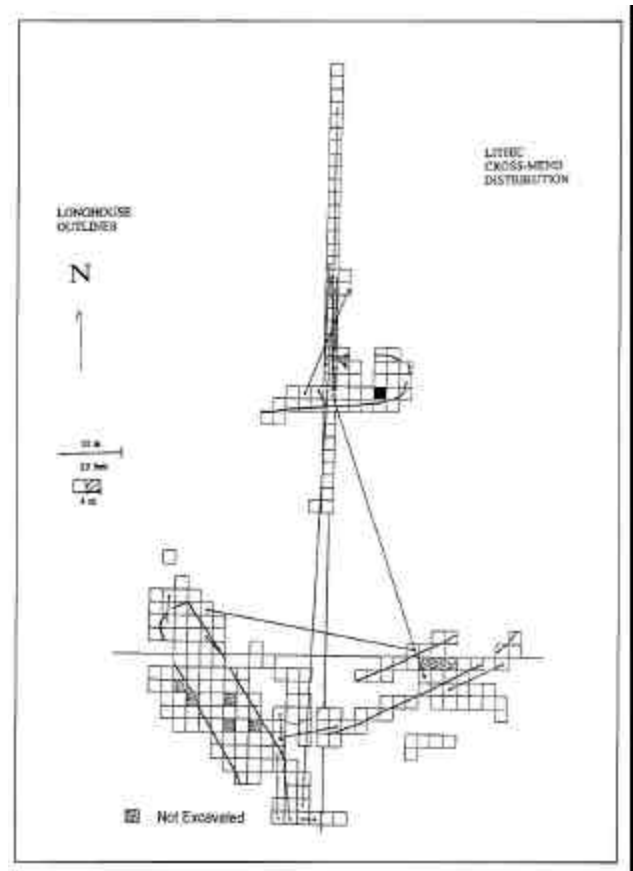


Figure 3. Lithic cross-mend distribution at the Eaton Site.

patterns in cultivated fields. Thus, plowing does not appear to have destroyed the general distribution of artifacts, although the specific provenience of said artifacts was certainly disturbed. Artifact movement correlated with that of a similar study done at the Calvert Site, an Iroquoian village in southwestern Ontario, described by Peter Timmins (1997). Timmins states that he considers the cross-mends at Calvert to be evidence for waste streams, the name given by Schiffer (1987) to the pathways that are followed in the disposal of garbage. Ceramic cross-mends from Eaton also provide evidence for waste streams at the site.

Using Buffalo State's collection of broken points from Eaton, I performed lithic cross-mends to see if they duplicated the patterns found with the ceramic ones. Starting out with 542 point tips, 553 bases, and 23 midsections, I was able to form 22 mends. These represent 4 percent of the total potential point mends. These mends were then plotted on an excavation map as was done with the ceramic cross-mends (Figure 3). There are many reasons why only 22 mends could be formed. Reuse can often remove artifacts from the record. Collins (1975), discussing lithic technology, describes the various ways a stone tool might be reused. Artifacts can be

modified, either from one form to another, such as end scraper to side scraper, or to another category altogether. A tool can also be recycled directly into another task, as when a worn knife is used as a scraper.

Secondary use occurs when little or no modification is needed to make an object suitable for its new use (Schiffer 1976). An example would be a broken point tip or base being picked up and reused as a scraper or burin. I found evidence for a combination of these two techniques while examining point tips for potential mends. One of the tips had been reworked. The broken edge had been flaked to form a cutting or scraping surface. An intensive study of scrapers from the Eaton Site might reveal other point fragments similarly transformed.

Scavenging and collecting could also account for this, as well as explaining the lack of many larger artifacts, such as axes and large points or bifaces. These activities are performed by both prehistoric and modern societies, and almost any site we look at has been subjected to these behaviors in some form. Schiffer (1975:839), rephrasing Ascher (1968:50-51), states that useful items will be scavenged and reused. Not only are some objects multifunctional, as already discussed, but some can also be used for different purposes in different time periods (Gibbon 1984:142).

Surface collecting usually focuses on finished tools, in which a major investment in time and labor was made (Schiffer 1976). This focus on collecting easily identifiable items, such as decorated rimsherds or projectile points, has an adverse effect on research. Chronological models are usually dependent on these very artifacts (Schiffer 1987).

There is a long history of such collecting activity at the Eaton Site. At the turn of the century, a number of individuals collected here. Frederick M. Houghton, A. L. Benedict, D. Silver, and others all collected extensively in the Buffalo area. Unfortunately, much of their collections have deteriorated or been lost (White 1961). It is reasonable to assume that local amateur collectors have also picked over the Eaton Site. Furthermore, these activities are exacerbated by the n-transfoms mentioned above.

Plowing represents a particularly insidious form of cultural transformation. Several experiments have been done to discern the effects of plowing on artifact distribution. Some of these show that the movement in the direction of the plow is greater than the lateral movement (Schiffer 1987; Trubowitz 1978). Based on plow scars found on the subsoil during excavations at Eaton, it appears that the plows were run in a predominantly north/south direction. This type of movement was also reported by Roper (1976) at a plowed site in Illinois. This could be one reason for the north/south movement seen in the mend patterns in the northern units at Eaton.

Plowing also has a size sorting effect, bringing larger items, more desirable to collectors, to the surface (Schiffer 1987). At the same time, plowing can reduce artifact size, and smaller pieces are moved downward, keeping them in the archaeological record (Schiffer 1983). Another factor is that larger objects show more longitudinal movement (Schiffer 1987; Trubowitz 1978). Because the mends that I worked with are made up of smaller artifacts, Trubowitz's experiments in "salting" a field with "artifacts" is significant. He found that the horizontal associations were not greatly disturbed, especially regarding smaller artifacts. This is in agreement with the movement that I see reflected in Eaton's crossmends.

Finally, the major portion of the site remains unexcavated, limiting the number of matches found. While this is true for ceramic fragments, it is especially so for projectile point". Since a point only breaks into two or three recognizable pieces, finding matches is more difficult, whereas not all the pieces of a pot are needed to draw inferences from it. Disposal practices could also explain the relative dearth of point fragments versus ceramic ones. Items with potential future use, such as broken points, might be left in a provisional discard area, while other refuse was removed quickly in secondary deposits. These maintenance activities are the starting point of refuse streams (Schiffer 1987).

Results

A comparison of the two distribution maps shows some similarities in the southern units. Since the northern unit, were excavated after Kathryn Guest had formed the ceramic mends, I had no cross-mends to work with from those units. This means that the lithic cross-mends from the northern units, which comprise just over one-half of the total mends will have to be looked at on their own.

Both maps show an east/west movement between the two southern longhouses, as well as movement between the longhouses and the middens on the south and west banks. There are more connections seen with the ceramics, including some with multiple sherds in one mend. Several possibilities may explain this. One is that a broken pot will yield more fragments than a point. Another possibility, mentioned earlier, is reuse.

Discard practices can mix together materials not related to each, or discarded at different times (Schiffer and Rathje 1973; Gifford 1975). These practices can also separate items that belong together, such as the two halves of a point (Rathje and Schiffer 1982). Villa, studying cross-mends from an apparently simple site, found that there was evidence for a lot of post-depositional movement (Schiffer 1983). Also, Butzer (1982) mentions that secondary refuse is sometimes removed for use as backfill.

There is some evidence from the ceramic cross-mends for a provisional or temporary refuse location along the outer southern wall of the east longhouse. Two sherds from that area match up with sherds found in the west bank midden. Others from this area match fragments found within the east longhouse proper. Two pieces from inside the west longhouse form mends with sherds on the west bank as well. Since sherds from the west bank can be considered to be in a secondary refuse location, it can be inferred that those fragments found inside were missed during maintenance processes, and that the sherds outside the east longhouse were thrown there temporarily.

Interestingly, the lithic cross-mends do not show the same patterns, although this may be in part due to the lack of ceramic mends from the northern units. There is one mend from pieces found on the west bank and inside the west longhouse, and another from a point and tip found outside the east longhouse. Both halves of this point were along the south wall, which strengthens the argument for temporary refuse discard there.

Four lithic mends were formed from pieces found in the south midden, one from two halves found in the midden, one with a piece from the area between the east and west longhouses, one from inside the west longhouse, and finally one from outside the north longhouse. It is of interest that, out of only twenty-two lithic mends, four had at least one half in the south midden. The ceramic mends, conversely, had only one of these, with both sherds found in the midden. The piece found in the area between the two southern longhouses could have ended up there in a variety of ways. Trampling, child's play, or post-depositional movement could all have caused this. It is the mend that includes one piece from the northern longhouse that is most intriguing, as there is no other evidence for this type of movement.

There are also a couple of lithic cross-mends that show house-to-house movement. One of these is between the inside of the north longhouse and the inside of the east longhouse. The other has its two halves on the facing walls of the east and west houses. In the second, both pieces were found outside the longhouse walls, but within one unit, close enough that post-depositional processes could have caused the movement from inside to outside. Timmins (1997) proposes that this is probably more a result of "interaction between households" than evidence for waste streams.

Seven mends were made with one-half found inside the northern longhouse, and one with both sections found inside. Of the other lithic fragments, four were found in the afore-mentioned Feature 50. Another two were found just outside the north wall of the longhouse, and one was part of the house-to-house connection with the eastern longhouse mentioned earlier. Also in the north, there is one lithic mend from outside the longhouse wall and Feature 50, one from the outside wall and to the north, and one that stretches from the

southern midden to the northern longhouse wall. The number of connected bases and tips found just outside this northern longhouse could represent another provisional garbage pile where pieces were left before being moved to Feature 50. Why one piece from this area is associated with the south midden cannot be answered with the available evidence.

Further support for both provisional refuse areas is found in the distribution maps for stone debris, potsherds, and point tips/bases. The units along the south wall of the eastern long house, as well as those to the north of the northern longhouse, show two of the highest distributions for stone debris and potsherds outside of the southern midden. The east longhouse area also contained twenty-seven point tips and eighteen bases, while the northern area held eleven tips and fifteen bases, as well as fifteen whole points.

There is one obvious difficulty shown in these maps (Figures 2 and 3) regarding the northern area, which is that Feature 50 is less than a dozen meters away from the longhouse wall. Excavation in this part of the site involves a one unit (2 m) wide trench running north from the longhouse. Those distribution maps already mentioned, as well as one for fire-cracked rock, show a steady line of all types of refuse from the long house wall to Feature 50. Whether this is a result of post-depositional movement (e.g., plowing) or simply a pattern of refuse disposal is unclear.

It is also feasible that the deposit along the eastern longhouse is a secondary refuse location, not a temporary one. Although the cross-mends suggest otherwise, the fact that this deposit is the only one close to the eastern end of this house makes identification problematic. The question of why ceramic cross-mends indicate movement from here to the west bank rather than to the south midden is difficult to explain. One possibility mentioned by Timmins (1997) is curation of or sharing of used or broken pots. In this case, we cannot know if the pots moved from the western longhouse to the eastern one, east to west, or perhaps in both directions.

Another area shows a high concentration of stone debris, but only an average distribution of potsherds and fire-cracked rock. In this area, outside and near the east side of the western longhouse, there are five units containing over 2,000 various stone flakes, two of which contain in excess of 2,500 flakes. There is a strong possibility that this was an activity area of some type. The postmold distribution map for the site shows a "J" shaped line of posts in the center of this area, the only truly distinct line of postmolds seen aside from the longhouses (Figure 1). Examination of Figure 1 shows a similarly-shaped block of eight units between this area and the western longhouse that could be a focus for future excavation. Along with the stone debitage, the eight units excavated in this location revealed fourteen points, thirty-nine point tips, twenty-one point bases, twenty-one knives, one knife tip, one hun-

dred thirty-seven assorted scrapers, and numerous utilized or modified flakes. There were also a number of cores, core fragments, and choppers or bifaces found here (Chestnut n.d.; Schwabe n.d.). These numbers point to an activity area, either of stone tool manufacture and maintenance and/or heavy toll use, perhaps butchering. Keeley (1980) concluded from his studies of the correlation between the percentages of hand axes, small scrapers, and debitage that where there is good evidence for tool manufacture, large numbers of small tools are abandoned. Thus, remains at relatively long-term occupation sites would reflect tool manufacture, re-sharpening, and the use of "tools to make tools." Schiffer (1972) has also argued that the relatively useless by-products of activities, such as debitage and butchery waste, have been observed to reflect locations of activity performance.

Since certain types of refuse, especially sharp stone flakes, are usually removed from activity areas for safety reasons, it is possible that this area served some other function. The postmolds could reflect an earlier habitation that was being used as a partially sheltered chipping area. There is evidence that many Iroquoian groups settled in areas of previous occupation. Both Ritchie, discussing the Kelso Site (1965) and Timmins (1997) mention overlapping villages. This site, on a knoll overlooking a good water supply, would appear to be a prime location for a village. Thus, these post molds could reasonably be from an earlier structure. In such a case, the debris might have been left as primary refuse rather than being removed to another location. Such a scenario would explain the high density of flakes in this area. Schiffer (1987) also makes reference to abandoned structures as potential refuse locations. While this might account for the high levels of lithic artifacts found here, it would not explain the low levels of other waste.

Finally, abandonment could be a cause for some of the deposits uncovered not directly associated with middens. As Schiffer (1972: 162) has stated, an increase in site size, population and/or time of occupation will result in a decrease in the "correspondence between the use and discard locations for all elements at a site." By the same token, a decrease in size or population, perhaps in anticipation of abandonment, should result in an increase in such correlates. Such behavior is recognized as a source of debris. In groups where frequent abandonment is expected, however, artifacts are often deposited as de facto refuse rather than being transported to a new location (Schiffer 1987).

Conclusions

In summary, the cross-mend distribution patterns at the Eaton Site yield evidence for several waste streams: 1) from the western end of the west longhouse to the west bank; 2) from the eastern end of the west longhouse to the south midden; 3) from the north longhouse to Feature 50; 4) from inside the east longhouse to along the outside of its south wall and from there to the west bank. The anomaly found in the lack of ceramic cross-mends from the south midden is probably the result of a focus on reforming pots. If mends from this locus were done with emphasis on identifying cross-mends, it is likely that the results would be more informative. Nevertheless, the argument for this refuse stream is adequately supported by the lithic mends. Finally, artifact distribution patterns at the site also reveal a potential lithic activity area which warrants further exploration.

Acknowledgements

There are two people whose help was instrumental from the beginning of this project. The many hours that Kathryn Guest spent trying to reconstruct ceramic vessels from the Eaton Site materials enabled me to begin the process of studying artifact distribution and disturbance, as well as waste stream analysis. I am also most grateful to Dr. William Engelbrecht, Buffalo State College professor and Houghton Chapter member, for his advice, patience, and support during the analysis and drafting of this work.

References Cited

- Ascher, Robert
1968 Time's Arrow and the Archaeology of a Contemporary Community. In *Settlement Archaeology*, edited by K. C. Chang, pp. 43-52. National Press Books, Palo Alto.
- Binford, Lewis R.
1964 A Consideration of Archaeological Research Design. *American Antiquity* 29:425-441.
1977 *For Theory Building in Archaeology*. Academic Press, New York.
- Butzer, Karl W.
1982 *Archaeology as Human Ecology*. Cambridge University Press, Cambridge.

- Chestnut, Donna
n.d. *The Eaton Site Master Directory*. Manuscript on file, Department of Anthropology, Buffalo State College, New York.
- Collins, Michael B.
1975 Lithic Technology as a means of Processual Inference. In *Lithic Technology*, edited by Earl Swanson, pp. 15-34. Mouton Publishers, The Hague.
- Engelbrecht, William E.
1991 Erie. *The Bulletin*, Journal of the New York State Archaeological Association, 102:2-12.
1994 The Eaton Site: A Preliminary Analysis of the Iroquoian Component. *The Bulletin*, Journal of the New York State Archaeological Association, 107:1-8.
- Engelbrecht, William editor
1995 The Eaton Site: A Report of the 1995 Excavations by Buffalo State College. Department of Anthropology, Buffalo State College, New York.
1997 The Eaton Site: A Report of the 1997 Excavations by Buffalo State College. Department of Anthropology, Buffalo State College, New York
- Gibbon, Guy
1984 *Anthropological Archaeology*. Columbia University Press, New York.
- Gifford, Diane P.
1975 Natural Processes Affecting Cultural Materials. In *Explorations in Ethnoarchaeology*, edited by R. A. Gould, pp. 77-101. University of New Mexico Press, Albuquerque.
- Hodder, Ian and Clive Orton
1976 *Spatial Analysis in Archaeology*. Cambridge University Press, Cambridge.
- Keeley, Lawrence H.
1980 *Experimental Determination of Stone Tool Uses: A Microwear Analysis*. University of Chicago Press, Chicago.
- Rathje, William L, and M. B. Schiffer
1982 *Archaeology*. Harcourt Brace Jovanovich, New York.
- Ritchie, William A.
1965 *The Archaeology of New York State*. The Natural History Press. New York.
- Roper, Donna C.
1976 Lateral Displacement of Artifacts Due to Plowing. *American Antiquity* 41:372-3175.
- Schiffer, Michael B.
1972 Archaeological Context and Systemic Context. *American Antiquity* 37:156-165.
1975 Archaeology as Behavioral Science. *American Anthropologist* 77:836-848.
1976 *Behavioral Archaeology*. Academic Press, New York
1983 Toward the Identification of Formation Processes. *American Antiquity* 48:675-706.
1987 *Formation Processes in the Archaeological Record*. University of New Mexico Press, Albuquerque.
- Schiffer, Michael B, and W. L. Rathje
1973 Efficient Exploitation of the Archaeological Record. In *Research and Theory in Current Archaeology*, edited by Charles Redman, pp. 169-179. Wiley Interscience, New York.
- Schwabe, Christian
n.d. Eaton Point Tips and Broken Point Bases: A Comparative Study. Manuscript on file, Department of Anthropology. Buffalo State College, New York.
- Timmins, Peter A.
1997 *The Calvert Site: An Interpretive Framework for the Early Iroquoian Village*. Canadian Museum of Civilization, Quebec.
- Trubowitz, Neal L.
1978 The Persistence of Settlement Pattern in a Cultivated Field. In *Essays in Northeastern Anthropology in Memory of Marian E. White*, edited by W. E. Engelbrecht and D. K. Grayson, pp. 41-66. Occasional Papers in Northeastern Archaeology. Department of Anthropology, Franklin Pierce College, Rindge, New Hampshire.
- Watson, Patty Jo, S. A. LeBlanc and C. L. Redman
1984 *Archaeological Explanations: The Scientific Method in Archaeology*. Columbia University Press, New York.

White, Marian E. Wright, Traci

1961 *Iroquois Culture History in the Niagara Frontier Area of New York State*. Anthropological Papers, Museum of Anthropology. University of Michigan No. 16. Ann Arbor.

1971 Ethnic Identification and Iroquois Groups in Western New York and Ontario. *Ethnohistory* 18(1):19-38.

Wood, W. Raymond and D. L. Johnson

1981 A Survey of Disturbance Processes in Archaeological Site Formation. In *Advances in Archaeological Method and Theory*, edited by M. B. Schiffer, pp. 315-381. Academic Press, New York.

Wright, Traci

n.d. Patterns of Matrilocalty Apparent Through the Analysis of Stylistic Attributes of Ceramics. Manuscript on file, Department of Anthropology, Buffalo State College, New York.

In Memoriam

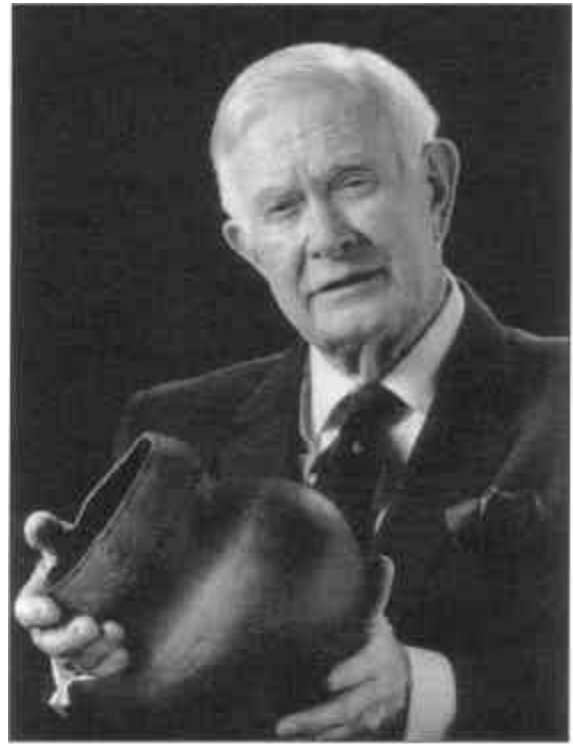
James F. Pendergast (1921-2000)

New York State archaeology and northeastern North American archaeology lost a preeminent scientist when James F. Pendergast passed away on September 5, 2000, in Smiths Falls, Ontario, Canada. Born in Cornwall, Ontario on May 21, 1921, James Pendergast was educated at Cornwall Separate School and Cornwall Collegiate Institute. He was in the military until his retirement from the Canadian Forces in 1972. He entered the Canadian Army Active Service Force in 1940 and served in World War II as an instructor and, subsequently, in many senior positions in Canada, Europe, and the Middle East. Interestingly enough he was very much involved with the United States in intelligence activities with the U.S. Department of the Army General Staff in 1945. He was a member of numerous Canadian military organizations including the Royal Canadian Artillery Association. He received several awards during his military career including the Canadian Forces Decoration in 1957 and the United States Army General Staff (Intelligence) Commendation in 1946. After his retirement as Lieutenant Colonel, he was appointed Assistant Director of Operations, National Museum of Man (now Canadian Museum of Civilization) in 1972 until his retirement in 1978.

James Pendergast's unique career not only involved the military, for museum administration and archaeology became his primary focus after 1972. His archaeological contributions were marked by high quality published research papers, stimulating discussions with both professional and non-professional colleagues, numerous presentations at conferences, and awards for excellence in his field. Archaeologists in New York State were especially fortunate to benefit from his ability to foster cross-border cooperation and communication between Canada and the United States.

Attending professional meetings was one of Jim's major interests. In addition to holding memberships and being a familiar figure at Canadian meetings, such as the Canadian Archaeological Association and the Ontario Archaeological Association, he was often present at meetings of the New York State Archaeological Association, the New York Archaeological Council, The Society for Pennsylvania Archaeology, the New York Academy of Sciences, the American Association for the Advancement of Science, the Eastern States Archaeological Federation, the Conferences on Iroquois Research, and a number of archaeological conferences sponsored by the Research Division of the Rochester Museum and Science Center. Throughout the years he was also involved with Heritage Canada, Heritage Merrickville, and the Champlain Society. He participated in excavations at the Beckstead and the Maynard-McKeown

sites, both in Ontario. As a consulting archaeologist he was involved with several utility line surveys in Ontario.



Over sixty major publications can be attributed to James Pendergast's efforts over the years. While the majority of these concern the prehistory and history of Ontario and north eastern Canada, his research also involved New York, Pennsylvania, and the middle Atlantic states. Listed below are publications relevant to Northeastern archaeology.

James Pendergast was the recipient of many awards. In 1976 he received an Honorary Doctor of Science degree from McGill University. Besides being elected a Fellow of the New York State Archaeological Association (1991), he received the Crabtree Award from the Society for American Archaeology (1991), the Twenty-five Year Award (1988) and the J. Norman Emerson Silver Medal (1994) from the Ontario Archaeological Society, and in 2000 the Smith-Wintenberg Award from the Canadian Archaeological Association.

James Pendergast married Mary Margaret Denton in 1944 and they had four children. Sadly, Margaret died shortly after Jim did. She unfailingly supported his archaeological endeavors and accompanied him to as many meetings and conferences as possible over the years.

Many New York archaeologists were able to attend Jim's funeral in his hometown, Merrickville, Ontario. He will be missed by many, and researchers in New York State will have lost potential interpretations of on-going research, papers not delivered or published and, above all, a wonderful personality that inspired so many to achieve their best in archaeology.

Charles F. Hayes III,
Lewis Henry Morgan Chapter; NYSAA

Selected Publications by James F. Pendergast

- 1962 The Crystal Rock Site, An Early Onondaga-Oneida Site in Eastern Ontario. *Pennsylvania Archaeologist* 32 (1):21-3
- 1963 Archaeological Survey in Quebec 1963. Manuscript on file in the Canadian Museum of Civilization, Ottawa.
- 1963 Canadian Archaeology and History in 1962. *Canadian Geographical Journal* 66 (4):132-9. Royal Canadian Geographical Society, Ottawa.
- 1963 The Payne Site. *National Museum of Canada Bulletin* No. 193:1-27.
- 1964 The Waupoos Site, An Iroquois Component in Prince Edward County. *Pennsylvania Archaeologist* 34 (2):69-89.
- 1964 Nine Small Sites on Lake St. Francis Representing an Early Iroquois Horizon in the Upper St. Lawrence River Valley. *Anthropologica* n.s. 6(2):183-221.
- 1965 Other Ideas on the Ontario Iroquois Controversy. *Ontario Archaeology* 8:39-44.
- 1965 An Archaeological Reconnaissance of the Eastern Portion of the Triangle of Land between the Ottawa and St. Lawrence Rivers in 1965. Manuscript on file in the Canadian Museum of Civilization, Ottawa.
- 1966 *Three Prehistoric Iroquois Components in Eastern Ontario: The Salem, Grays Creek and Beckstead Sites*. National Museum of Canada Bulletin No. 208.
- 1966 *The Berry Site*. National Museum of Canada Bulletin, No. 206.
- 1967 *Iroquois Archaeology in Eastern Ontario and Southern Quebec. In Iroquois Culture History and Prehistory, Proceedings of the 1965 Conference on Iroquois Research*, pp. 67-69. University of the State of New York, State Education Department, New York State Museum and Science Service, Albany.
- 1967 A Comparison of St. Lawrence River Valley Iroquoian Sites with the Dawson Site. *Ontario Archaeology* 10:3-11.
- 1968 The Summerstown Station Site. *National Museum of Canada Anthropology Papers* 18:1-47.
- 1969 The MacDougald Site. *Ontario Archaeology* 13:29-53.
- 1972 The Lite Site: An Early Southern Division Huron Site near Belleville. Ontario. *Ontario Archaeology* 17:24-61.
- 1973 *The Roebuck Prehistoric Village Site Rim Sherds: An Attribute Analysis*. National Museum of Man Mercury Series, Archaeological Survey of Canada, Paper 8.
- 1974 The Sugar Bush Site. *Ontario Archaeology* 23:31-61.
- 1975 An In-Situ Hypothesis to Explain the Origin of the St. Lawrence Iroquoians. *Ontario Archaeology*, 25:47-55.
- 1976 *Anthropology and History Publications / Publications d'anthropologie et d'histoire*. National Museum of Man, Ottawa.
- 1977 National Museum of Man Dig at Williamsburg. *Arch Notes* 77-7:32-33. Ontario Archaeological Society.

- 1979 The Antiquity of Certain Iroquoian Ceramic Motifs. *Ottawa Archaeologist* 8 (9): 3-13.
- 1979 The Hochelaga Palisade. *Ottawa Archaeologist* 9(3): 8-18.
- 1980 Ceramic Motif Mutations at Glenbrook. In *Proceedings of the 1979 Iroquois Pottery Conference*, Research Records No. 13, pp. 133-145. Rochester Museum & Science Center.
- 1981 *The Glenbrook Site: A Late St. Lawrence Iroquoian Component in Glengarry County, Ontario*. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper 100.
- 1981 Distribution of Iroquoian Discoidal Clay Beads. *Ontario Archaeology* 36: 57-72.
- 1981 Potential Pre-Historic Archaeological Sites in the Ontario Hydro Eastern Ontario Route Stage Study Area. Manuscript on file in the Canadian Museum of Civilization. Ottawa.
- 1982 *The Origin of Maple Sugar*. Syllogeus, National Museum of Natural History 36, Ottawa.
- 1982 Who Were the St. Lawrence Iroquois? In Survey of Roebuck Prehistoric Village Site, Grenville County, Ontario, *Proceedings of the International Congress of Museums Waterlogged Mood Working Group Conference*, Ottawa, 1981. International Council of Museums. Ottawa Conference.
- 1982 The History of the St. Lawrence Iroquoians and Some Recent Research. *Arch Notes* 82-1: 2-4.
- 1983 St. Lawrence Iroquoian Burial Practices. *Ontario Archaeology* 40:49-56.
- 1984 Simcoe County: Obscure Archaeological Bibliography. *Arch Notes* 84-1:3-6.
- 1984 *The Beckstead Site-1977*. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper 123. Ottawa.
- 1984 Circular Embankments in Eastern Ontario. *Ottawa Archaeologist* 11(4):3-8.
- 1985 Were the French on Lake Ontario in the Sixteenth Century? *Man in the Northeast* 29:71-85, Albany, New York. Reprinted in *Ottawa Archaeologist*, 12(7): 71-85.
- 1985 Huron-St. Lawrence Iroquois Relations in the Terminal Prehistoric Period. *Ontario Archaeology* 44: 23-39.
- 1988 The Maynard-McKeown Site BeFv-1, A 16th Century St. Lawrence Iroquoian Village Site in Grenville County, Ontario: A Preliminary Report. *Ottawa Archaeologist* 15 (4): 1-13.
- 1989 The Significance of Some Marine Shell Excavated on Iroquoian Archaeological Sites in Ontario. In *Proceedings of the 1986 Shell Bead Conference*, pp. 97-112. Research Records No. 20, Rochester Museum & Science Center, Rochester, New York.
- 1990 Native Encounters with Europeans in the Sixteenth Century in the Region Now Known as Vermont. *Vermont History* 58 (2): 99-124.
- 1990 Emerging Saint Lawrence Iroquoian Settlement Patterns. *Man in the Northeast* 40: 17-30.
- 1991 The St. Lawrence Iroquoians: Their Past, Present and Immediate Future. *The Bulletin*, Journal of the New York State Archaeological Association 102: 47-74.
- 1991 *The Massawomeck: Raiders and Traders into the Chesapeake Bay in the Seventeenth Century*. Transactions of the American Philosophical Society, Vol. 81. Philadelphia.
- 1992 Susquehannock Trade Northward to New France Prior to A.D. 1608: A Popular Misconception. *Pennsylvania Archaeologist* 62 (1):1-11.

- 1992 Some Notes on Cross-Border Archaeology in this Region. *The Bulletin*, Journal of the New York State Archaeological Association 104: 31-43.
- 1992 Some Notes on Ceramic Smoking Pipes from St. Lawrence Iroquoian Archaeological Sites. In *Proceedings of the 1989 Smoking Pipe Conference*, pp. 51-70. Research Records No. 22. Rochester Museum & Science Center, Rochester, New York.
- 1993 More on When and Why the St. Lawrence Iroquoians Disappeared. In *Essays in St. Lawrence Iroquoian Archaeology*, pp. 9-47. Occasional Papers in Northeastern Archaeology No. 8. Copetown Press. Dundas, Ontario.
- 1993 Some Comments on Calibrated Radiocarbon Dates for St. Lawrence Iroquoian Sites. *Northeast Anthropology* 46: 1-32. Albany.
- 1994 The Kakouagoga or Kahkwas: An Iroquoian Nation Destroyed in the Niagara Region. In *Proceedings of the American Philosophical Society* 138 (1): 96 - 144. Philadelphia, Pennsylvania.
- 1994 The Introduction of European Goods into the Native Community in the Sixteenth Century. In *Proceedings of the 1992 People to People Conference*, pp. 7-18. Research Records, No. 23. Rochester Museum & Science Center, Rochester, New York.
- 1994 Susquehannock Trade Northward to New France prior to A.D. 1608. In *Tools for Tomorrow: Archaeological Methods in the 21st Century*, pp. 75-84. Proceedings of the 1991 Symposium, Ontario Archaeological Society, Ottawa.
- 1995 The Identity of Jacques Cartier's Stadaconans and Hochelagans: The Huron Iroquois Option. In *Origins of the People of the Longhouse*, pp. 106-118. Proceedings of the 21st Annual Symposium of the Ontario Archaeological Society, Toronto.
- 1996 Notes on a Collection from the St. Regis Site. *Ottawa Archaeologist* 23(2): 2-7.
- 1996 Problem Orientation for St. Lawrence Iroquoian Archaeological Research. *Journal of Middle Atlantic Archaeology* 12: 53-60.
- 1996 High Precision Calibration of the Radiocarbon Time Scale: CALIB 3.0.3 (Method 'A') in a St. Lawrence Iroquoian Context. *The Bulletin*, Journal of the New York State Archaeological Association. Nos. 111 and 112: 35-62.
- 1996 Hamlets Become Villages. In *Home is Where the Heart Is*, pp. 46-54. Proceedings of the 1996 Ontario Archaeological Society Symposium. Kingston.
- 1998 Hochelaga. In *Archaeology of Prehistoric Native Americans: An Encyclopedia*, pp. 162-63. Garland Publications, New York and London.
- 1998 The Confusing Identities Attributed to Stadacona and Hochelaga. *Journal of Canadian Studies* 32 (4): 149-167.
- 1999 The Ottawa River Algonquin Bands in a St. Lawrence Iroquoian Context. *Canadian Journal of Archaeology* 22(1-2):63-136.
- 2000 The Identity of Stadacona and Hochelaga: Comprehension and Conflict. In *Interpretations of Native North American Life: Contributions to Ethnohistory*. University Press of Florida. Gainesville.
- Co-Authored publications**
- 1972 Cartier's Hochelaga and the Dawson Site. McGill-Queens University Press, Montreal. Co-authored with B. G. Trigger.

- 1978 The St. Lawrence Iroquoians. In *Handbook of North American Indians*. Vol. 15. *Northeast*, pp. 357-61 (Bruce G. Trigger volume editor). Smithsonian Institution, Washington, D.C. Co-authored with B. G. Trigger.
- 1980 Trace Element Analysis of Iroquois Pottery. *Canadian Journal of Archaeology* 4:119-145. Co-authored with B. G. Trigger, L. Yaffe, M. Diksie, J. L. Galinier, and H. Marshall.

- 1993 The Evidence for a St. Lawrence Iroquoian Presence on Sixteenth-Century Mohawk Sites. *Man in the Northeast* 45: 77-86. Albany. Co-authored with R. D. Kuhn and R. E. Funk.

In Press

European Voyages to the New World Prior to A.D. 1600: A Source of European Goods for the Abenaki. University of Vermont.

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