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Preface

On November 15-16, 1997, the Rochester Museum & Science Center sponsored the Longhouse Conference: Inquiries into the Architecture, History and Symbolism of the longhouse. The Conference was sponsored by The Arthur C. Parker Fund for Iroquois Research and the RMSC Research Department.

Through the courtesy of Connie Bodner, former RMSC Director of Collections and Research, many of the contributed papers were made available to the New York State Archaeological Association for publication in several issues of The Bulletin. The first paper, published in The Bulletin No. 117, was "Onondaga longhouses in the Late Seventeenth Century on the Weston Site" by A. Gregory Sohrweide. In addition to the papers in this issue, it is expected that others will be published in future issues as authors update their data and revise their papers. The contributions by the many participants at the Longhouse Conference and those individuals who worked hard to make the Conference a success are greatly appreciated.

This issue also includes three additional reports relating to archaeological research in the northeast.

The Editors
The longhouses of Seventeenth-Century Maps: Real or Imagined?

Shirley W. Dunn, East Greenbush, New York

Longhouses on seventeenth-century maps reflect four areas of influence: maps of the middle Atlantic area by John White and Captain John Smith; maps of the Hudson Valley attributed to Adriaen Block and Cornelis Hendrickson; French maps of the St. Lawrence; and maps of the coast of New England. The following article briefly surveys maps from these four area influences. However; the pervasive illustrations by John White, as well as Captain John Smith’s work, affected maps in all areas.

The longhouse has been shown in numerous drawings on seventeenth century maps—from Spanish territory in Florida up the seacoast to Maine and down the St. Lawrence to include central New York. Occasionally accompanied by other structures, and sometimes by palisades, the native dwelling is a nearly universal artifact. Since it is shown in varied lengths and heights, the maps imply that there were variations among longhouses. On maps, there are no particular stylistic distinctions separating linguistic groups, such as the Algonquians and Iroquois. Moreover, the popular seventeenth- and eighteenth-century name for Indian residences, wigwam also did not distinguish between the two groups, but was used by Europeans on maps and drawings for the homes of both Iroquois and Algonquians (Figure 1).

Figure 1. The word wigwam was a common seventeenth- and eighteenth-century word for an Indian residence. This is the Mohawk’s 1734 “Schohory [Schoharie] wigwam.” (New York Secretary of State Archives, Land Papers: 11:106).
The village of Secotan, with its mat-covered houses, was painted by John White about 1585. Because the ends of houses are shown open, some interior details of the framing and platforms can be seen. John White’s watercolors are at the British Museum.

The best-known contact-period pictures of native Americans are the watercolors from 1585 by artist John White who visited the area of the Outer Banks and the adjacent mainland in present North Carolina. White had come to America in connection with a colonization project that failed. He recorded scenes of Indian life which he saw. Note in Figure 2 that the longhouses of an Indian village lacked smokeholes; possibly here smoke escaped through other openings or the inhabitants cooked outside. Palisades, which alter the character of a village, are usually related to war, but occasionally can have domestic uses. White’s painting (Figure 2) showed a palisade or fence fronting a building.

John White’s work was known through the engravings of a Dutch artist, Theodore de Bry (1590), but the process of converting the drawings to engravings reduced their accuracy. Structures as painted by White and as engraved by de Bry had significant differences. Obviously, it is important for researchers to use the actual watercolors to study such details as the change in coverings between the sides and roof of the longhouse. Unfortunately, it was from their engraved forms that these pictures were widely circulated and copied as illustrations on many later maps.

John White showed villages and houses both in peaceful settings without fortifications and in war, surrounded by palisades. A crucial text by Thomas Harriot, who accompanied White to the Carolinas, complemented White’s illustrations (Harriot 1972). The peaceful village of Secotan, shown in White’s painting (Figure 2), features a number of structures, and Harriot’s text mentions a variety of uses for the buildings. The structure in the lower corner, for example, was a tomb containing the bodies of past chiefs. De Bry’s engraving (1590) altered the look of the structure (Figure 3).

While many views of the exterior arched shape of Indian dwellings are available, rarely does an illustrator give a glimpse of the interior framing. One view of the framing of a ceremonial longhouse (the tomb mentioned above) is shown in an engraving of John White’s work by Theodore de Bry (1590) (Figure 4). However, White did a separate painting of the tomb without any house around it, and consequently, without details of framing. De Bry apparently added the house around the tomb, as White had shown a normal house exterior for the tomb in his picture of the village. Thus the unique and valuable picture of longhouse framing poses problems regarding the source of the information. Did Harriot or White give de Bry the information for the inside framing, or is there a lost sketch by White of the framing of the interior?

According to the illustration, the side wall is built separately from the curved roof, and the two parts are lashed together along a purlin, valuable construction information. The transverse ties at the rear are needed to keep tension on the arch of the roof saplings. This two-part framing permits the buildings to have the height required for human activity and keeps the sides vertical. Such complex framing was overlooked in early descriptions of Ion-houses by Europeans.

Some maps became standards for an area and their information was used over and over again. It is important to look for the earliest version of a map, as many popular maps are merely slightly altered versions of other maps. Similar repetition occurred with a few stock illustrations, such as the c. A.D. 1635 depiction of two Mohican forts by Willem Jansz Blaeu (Figure 5). Blaeu may have been aware of the John White engravings, (although Blaeu’s longhouses have smoke holes, which White’s houses lacked), but the immediate inspiration for his drawing must have been the existence of two Mohican forts which were north of Fort
Figure 3. The tomb in the engraved version by Theodore de Bry looked different from the same house depicted in the lower left-hand corner of John White's painting of the village of secotan (2) (De Bry 1590).

Orange, one round and one rectangular. The two fortified villages had been noted on two previous maps of the upper Hudson, and drawings showing the shapes of Mohican houses had appeared on a map in 1674.

The two Mohican fortified villages subsequently appear as decorative illustrations on at least sixteen separate maps over the years, some in the Blaeu-Jansson-Visscher series (Blaeu 1635), and some issued under other names. The illustration's caption was changed as needed for the maps, and details of the pictures were slightly modified by various hands. On one map, the example of the fortified villages of the Mohicans was described as a Mohawk village, on another, as illustrating the lifestyle of "other nations that live here." Eventually, the illustration of the two forts was presented as a general example of an Indian village, on maps as far afield as New Jersey, Pennsylvania and even New Mexico (Figure 6). It is clear that the mapmakers were not aware of any major differences among Indian villages of different tribal groups.

Longhouses had appeared on the Virginia map done in 1607 by Captain John Smith and published in 1612 (Smith 1612). Smith, famous at the time for his Indian adventures.
put Powhatan’s house on his map (Figure 7). The interior of the same house is shown on the map, in an inset illustrating one of Smith’s best-known adventures, his capture by Powhatan (Figure 8). Although there is a fire in the center of the floor, there are no sleeping benches along the sides, as this large chief’s house was intended for council meetings and ceremonies. Smith was a credible eye-witness. His map, however, was engraved by William Hole. Thus Smith’s pictures of dwellings and the drawing of the interior of Powhatan’s house were subject, as were White’s, to change by the engraving process.

The picture shows the straight side wall as well as the lashing which connects separate saplings for the arched roof. Unfortunately, the house framing looks very similar to the 1590 engraving by Theodore de Bry of the Secotan chief’s tomb and apparently was copied from White, discussed above. The figure of a Susquehanna Indian on the Smith map (Figure 9) also repeats a figure drawn by White.

Smith’s map, however, made a unique contribution to the language of map symbols. Smith’s set of symbols became popular on seventeenth-century maps. These symbols, as listed in a corner of the map, are shown in Figure 9. “Kings’ houses” were indicated by a careful drawing of a longhouse, and “ordinary houses” were not shown individually, but instead were symbolized by a circle with a dot in it. The extent of Smith’s first-hand exploration of the terrain was indicated by a series of crosses. Beyond that line, the information came from the Indians. There were no Indian kings, of course; the word conveys a European concept of head man, sachem, or chief. The circle with a dot beside the larger house, indicating a chief’s residence, was widely used on maps thereafter, and understood by map readers at the time. The crucial legend explaining the meaning of the symbols, found on the earliest version of Smith’s map, got lost on some later maps; mapmakers copied the symbolic circles meaning groups of ordinary houses as well as the larger “king’s” long-house, without explaining the significance of the circle. As late as Romer’s map in 1700 (Colonel Romer 1700), a round circle with a dot in it is used to mean a group of Indian houses. Unfortunately, the symbol has led some map viewers to assume the circles meant round native dwellings, which they do not.

An interesting map of c. 1629, called "Carte vande Suydt Rivier" (Map of the South River), showing the Delaware Bay area, includes clearly drawn longhouses and enigmatic mound-shaped figures, including shadows. The mounds are not depictions of individual houses, but merely variations of the symbol for "ordinary" houses (Figure 10). Since this map stole from Captain Smith’s map, in the process of being copied around 1665, the circle symbols for villages were embellished until they looked like actual houses—which never appeared on Smith’s map.

The well-known Augustine Herrman map of 1673 (Herrman 1673) includes clearly drawn longhouses and no circular symbols in some of the same areas as the "Map of the South River," and also includes New Jersey (Figure 11). It, too, is very derivative, echoing earlier maps, especially Smith’s. Certain of the beautifully drawn houses are enlarged to represent chief’s houses, following John Smith’s example. Instead of using the circle with the dot as a symbol for a village, however, Herrman drew in additional houses.

An unpublished map of houses on the side of Delaware Bay, from archives at the Hague, the Netherlands, is more original (Figure 12). It dates to c. 1630 and may have been drawn by Gillis Housset. Housset was a sailor commissioned to make the first land purchase from the Indians there for Samuel Godyn, a Dutch investor who planned to start a patroonship approved by the Dutch West India Company. Gillis Housset was an eye-witness, and, as his little Dutch houses are recognizable, it is clear that he could draw acceptably. It has been suggested that the artist, Housset, being unaware of perspective, was trying to show the doors which were actually on the ends, but his knowledge of perspective on other parts of the map belies that. He apparently represented what he saw. There is a more rounded end to his Indian houses than on those in Smith’s drawings, and the doors are on the side. Occasional archeological reports have mentioned side doors on longhouse imprints and they are clearly shown on some later maps (see below).

Interestingly, one house on the Delaware Bay map is small, and probably was nearly round, rather than rectangular. Samuel de Champlain, who traveled along the coast of New England three times, also depicted round houses.
Figure 5. Drawing of two Mohican forts on the Hudson River near Fort Orange showed the way Mohicans fortified their houses, according to the caption. Map by W. J. Blaeu, c. 1635, is at the Archives, the Hague, the Netherlands.
Champlain has left maps which include his own sketches of Indian dwellings and corn fields in coastal New England. Champlain was a cartographer with strong artistic skills, although he did, at times, merely use symbols for houses. This contradiction adds difficulty to interpreting his maps. His chart of the Nauset Bay area on Cape Cod, however, illustrates his ability to capture the native scene (Figure 13). Champlain's Indian buildings featured thatch for roofs and sides, as had those of John White in North Carolina. No doubt, reeds for thatch were available near the seashore. Inland, where that was not the case, various types of bark commonly were used for covering buildings. Champlain's map shows wigwams of different shapes, some being round, some short longhouses, and some more lengthy longhouses. Certain structures may be ceremonial structures or chief's houses, as suggested on the map of Captain John Smith, while some are ordinary dwellings. Abandoned dwellings may have been used for seasonal storage or processing.

It is hard to know which structures, if any, had special uses. Nicholas Denys, a seventeenth century Frenchman who wrote about the Mic-macs of Maine and adjacent Canada, (where the house covering was birch bark) had a simple explanation for variations in size. He said, "If the family is a large one, they make it [the wigwam] long enough for two fires; otherwise they make it round" (Denys 1908:404).

One mapmaker who copied part of the New England coast from Champlain's work was Adriaen Block, who traversed the Hudson River and the coasts of New Netherland and New England. Block is credited with discovering the Connecticut River. He left New Netherland in July of 1614 with his map information. The map he produced (Figure 14), combining his own first-hand information in the area of New Netherland with that of other mapmakers of New England and the St. Lawrence, is well known through a nineteenth century copy by Edmund O'Callaghan (1855-87). O'Callaghan's less-than-perfect copy leaves off important artistic touches, such as Block's eyewitness drawings of the pre-1614 long houses of the Mohicans on the Hudson River (Figure 15). Varied building lengths and heights are suggested by Block, and the location of houses among the trees is interesting.

Block, one of the first Europeans who visited the Mohicans, arrived only a year or two after Henry Hudson. Drawings on Block's map, therefore, could be expected to echo Hudson's 1609 description of a Mohican house. However, J. F. Jameson's 1909 Narratives of New Netherland, which contains a universally-used version of Henry Hudson's account of his visit on the upper Hudson River, erroneously implies the Mohican houses were round. To eliminate any confusion, the author of this article examined the Dutch text published in 1624 by Johannes de Laet containing the only excerpts from Hudson's lost journal, with the help of Janny Venema, of the New Netherland Project. The 1624 text shows that the Jameson version, taken from this same source, is poorly worded. Properly translated, the Dutch should read: "These [people] I saw there in a house well-constructed of oak bark, and round about as if it had been an arch..." In other words, Hudson saw a longhouse, not a round dwelling, and his account, as given by Johannes de Laet, agrees with Block's sketches.

Block's map shows that he had learned that other Indians lived west of Fort Nassau on a large, interior river. These were the Maquaas, or Mohawks. The Mohawk River, shown on his map, trails off and does not connect with the Hudson. He apparently did not know about the connection because he was getting his information from the Indians and
had not personally traveled there. Many maps subsequently repeated this misinformation. Also shown on Block’s map was the new Dutch fort on Castle Island, near present Albany. Fort Nassau was built on Castle Island with an eye to protecting the traders as they expanded trade to less friendly natives than the Mohicans, who lived in the area.

Indian villages around New Netherland and in the New England area were indicated by clusters of small rectangles, the footprints of longhouses. Block’s information about Indian locations undoubtedly came from his Indian contacts, as well as from his travels and from other maps. Block made no distinctions in size or shape of dwellings between the Iroquoian villages to the west and the Algonquian locations in New England, suggesting that there were few obvious differences between them. He showed no palisaded forts on his map, good evidence that in the Hudson Valley, the Mohicans and other River Indians were at peace.

Block went back to the Netherlands in July 1614. After his departure, three men from Fort Nassau went inland to explore other rivers they had heard about from the Indians. The men were captured by the Minquaas, who lived on the Susquehanna River near Delaware Bay; they were an Iroquoian-speaking group who were at war with the Mohawks at the time.

Fortunately, Cornelis Hendricksen, also from Fort Nassau, early in 1615 entered and mapped Delaware Bay and made friends with Indians there, with a goal to establishing trade. On this trip he rescued the captured explorers far from Fort Nassau. Hendricksen’s subsequent 1616 map, which relied heavily on Block’s map but also used information from the rescued men, depicted the longhouses of two small fortified Minquaas villages in the newly discovered Delaware River area (Figure 16). The forts reflected their ongoing war with the Mohawks, a war mentioned on the map. The dwellings pictured inside their fortifications of palisades are loaf-shaped. Hendricksen also showed the location of the Mohawks, as Block had. He had updated their houses from the rectangular symbols of Block to longhouses, similar to those of the Minquaas (Figure 17).

In 1639, a map of present-day Manhattan and Brooklyn was drawn which connects specific Algonquian longhouses with individual Indian names. This map is called the Mana-
Figure 8. Captain John Smith's capture by Powhatan appeared as an inset on Smith’s 1612 map, shown in Figure 7. The inset shows the framing of a longhouse, but seems to have been copied from an illustration (Figure 4) made by Theodore de Bry in 1590 (de Bry 1590).
Figure 9. "King's houses" were the houses of chiefs of the village. Ordinary houses were not shown individually; their presence was indicated by a circle with a dot in it. Legend from John Smith's map of 1613.

Figure 10. The "mounds shown on the "Map of the South River" do not depict houses; they were derived from John Smith's circle and dot symbols for a group of ordinary houses. The map is in the Harrisse Collection, Map Division, Library of Congress.

Figure 11. Section of the Augustine Herrman Map of 1673 echo John Smith's map. Chief's houses are enlarged, but native houses are drawn in, instead of being represented by the circle-with-a-dot symbol. Map Division. Library of Congress.
Figure 12. Indian houses as well as a trader’s Dutch-style house were drawn at Delaware Bay about 1630. The map is in the Archives at The Hague, the Netherlands.

Figure 13. A scene at Nauset Bay, Cape Cod, drawn by Samuel de Champlain, features a variety of thatched Indian habitations. The map is at the Harvard College library.
Figure 14. A detail from the 1614 map attributed to Adriaen Block shows the Mohican Indians located on both sides of the Hudson River. Fort Nassau, shown, was built by Dutch traders on an island close to present-day Albany. Map at the Archives, the Hague, the Netherlands.
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Figure 15. Two sets of wigwams were drawn on Block's map, the earliest detailed map of the Hudson Valley. Adriaen Block saw Mohican dwellings between 1610 and 1614.

Figure 16. A detail from a map of 1616 attributed to Cornelis Hendricksen shows the fortified villages of the Minquaas, who were at war with the Mohawks. Map at the Archives at The Hague, the Netherlands.

The map shown is not the original, but one of two copies thought to have been made about 1665.

Many French maps depict the longhouses of New York, New England and the St. Lawrence River area. The most exact early map, by Marc Lescarbot, an explorer and writer, preceded Champlain's first printed map by three years (Figure 19). The map was engraved by Jan Swelinck after a drawing by Lescarbot, and appeared in Lescarbot's History of New France, published in 1609. Lescarbot, a lawyer and writer, had been at Port Royal in Nova Scotia in 1606, and journeyed down the New England coast. The map shows longhouses in Maine (note the Kennebec River) and Cape Cod (Malle Bar). The map represented the St. Lawrence River as far west as the fortified Indian village of Hochelaga, now Montreal.

Another map which depicts the longhouse is the so-called Bressani map. A 1650 map of New France, it is attributed to Francesco Gioseppi Bressani. It was engraved, no doubt altering its artistry somewhat, and was published in 1657. Bressani, a Jesuit priest, wrote extensively about the native Americans in the area west of Hochelaga. Father Bressani was a sympathetic observer who hoped to write a book about the Hurons and other native people he lived with. He tried to put many of the life ways he saw in the Huron culture on his map. Bressani carefully drew a dwelling, which was very similar to the habitations shown by John White in North Carolina, and by Adriaen Block in the Hudson Valley (Figure 20).

In the bottom left corner of the Bressani map is a drawing of a palisaded village, showing not only the expected longhouses, but two round houses inside the palisades. While these might be for storage, or for a special purpose, they are probably dwellings. A 1724 description from Joseph Lafitau tells what living in a round house was like. After describing typical cabins or lodges (wigwams), he wrote "those [lodges] built round and like icehouses have not even openings in the top so that they are much darker and the people in them are always at the mercy of the smoke" (see Snow 1997:69).

This survey will conclude with reference to two additional maps which show long houses.
Figure 17. The loaf-shaped house, of the Mohawks or "Canoemakers" were west of Fort Nassau on the 1616 map of Cornelis Hendrickson. His map perpetuated the geographical error that the Hudson and Mohawk River were not connected.

Figure 18. A detail from a copy of the 163N Manatus Map shows native houses near Fort Amsterdam and names their Indian owners. Wick is a Dutch word which mean, "place." Map in the Harrisse Collection. Map Division, Library of Congress.
Figure 19. An engraving of Lescarbot's map of the St. Lawrence River was published in 1609. Besides Indian longhouses along the coast of Canada and New England as far south as Cape Cod, it depicts the fortified village of Hochelaga (later Montreal). The map is shown in: R. G. Thwaites, ed., The Jesuit Relations and Allied Documents 1610-1791, Pageant, N Y. 1959, 1:192.
Figure 20. The Bressani map of 1657 contains realistic sketches of native life near the St. Lawrence River. Here a woman pounds corn in front of a wigwam. Copies can be obtained from the National Archives of Canada, Ottawa.

Figure 21. "A Mappe of Colonel Romer's Voyage to the 5 Indian Nations," done in 1700, contains in the center this sketch of Iroquois longhouses, with two sheds, probably for wood storage. The circle with the dot is the old map symbol which indicates a group of ordinary houses in addition to the chief's house, which is shown. A copy of the British map is in Manuscripts and Special Collections, New York State Library.
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The Indian Fort at x° Flats.

**Figure 22.** The 1695 map by Rev. John Miller of an Indian fort elected at the Schuyler farm north of Albany show a rare interior view of a longhouse, as well as the placement of entrances and smokeholes in others. A copy of the map is in Manuscripts and Special Collections, New York State Library, in the Crown Collection.

The first is titled "Map of Colonel Romer's Journey to the Five Indian Nations," and was drawn by Wolfgang Romer, an engineer helping Lord Bellomont plan the defenses of the colony of New York in 1700. Two versions of the map exist, one at the British Public Records Office, which seems to be the original, and one at the British Museum, which is possibly a very early, copy. The British Museum copy contains stylized longhouses at the center of the map and a fanciful cartouche. The original has more realistic decorations. Figure 21 is from the original version of the map, a copy of which is in the Crown Collection at the New York State Library. The graphic drawing of Iroquois wigwams at the center of the map seems to be taken from life. Romer's sketch of three wigwams also includes two sheds, probably for wood storage, and shows no palisades. The Romer map, interestingly, uses the circle with a dot in it, going back at least to John Smith's map: the circle and dot symbol indicates that while only one important house is shown, there were other "ordinary" houses around it.

The concluding view (Figure 22), done by Rev. John Miller in 1695 and titled "The Indian Fort at the Flats," was called to the author's attention by Paul R. Huey. It presents some of the most graphic drawings of wigwams on any map. Including "A wigwam open," according to a key which accompanied the map. Miller shows the locations of smokeholes and doors, as well as the rounded outline of the ends. In addition, he has included, as the key indicates, a cut-out view of one dwelling which shows the interior fireplaces, and suggests the platforms ringing the sides of the structure. Miller also did a similar map of the fort at Schenectady. In keys to both maps, Miller refers to the Mohawk longhouses on the maps as "Indians' wigwams."

**Discussion**

This map overview casts doubt on the still-widespread idea that the dwellings of Algonquians were inherently different from the dwellings of Iroquoians. According to mapmakers, and in common seventeenth-century parlance, reflected by the use of the word "wigwam," no clear stylistic line separating house styles by linguistic groups existed in the Northeast. Nevertheless, map drawings illustrate that longhouses varied. They were frequently altered and extended; when this happened, changes were made in location of entrances and in the shapes of the ends of the longhouse. Thus, it is not possible to characterize certain styles, such as blunt ends or rounded ends, as solely belonging to certain tribes. Coverings on wigwams depicted on maps varied by region according to available materials, rather than by tribal affiliation. Note, also, that saplings holding bark coverings in place were rarely shown. According to early descriptions, the squares of bark were lashed to the frame with bast (strips of the inner bark of certain trees).

The presence in the Americas of an accomplished artist such as John White, the Englishman who depicted the Indians of North Carolina at the moment of contact in 1585, was rare. While few trained artists ventured to this side of the ocean, amateurs did not hesitate to sketch Indian residences. Samuel de Champlain (who perhaps should be placed among the trained artists), John Smith, Marc Lescarbot and Francesco Bressani, as well as Adriaen Block and Cornelis Hendricksen, and later, Wolfgang Romer and John Miller, exhibited considerable talent in depicting native habitations. There also were, of course, numerous other skilled mapmakers whose work has not been included here.

As this brief survey has shown, mapmakers frequently obtained information from each other's maps. Caught in this tangle of copying, many archaeologists assume early drawings and map illustrations are so unreliable as to have no value. This is not the case. Having recognized that mapmakers copy from each other, understanding that many illustrations are not original, and realizing that vital details are lost in the engraving process, the researcher is forewarned. By treading carefully, significant information not available elsewhere about the construction of longhouses can be obtained by studying early maps, as this survey has indicated. This insight will be especially valuable in combination with close reading of seventeenth-century Dutch and French accounts.
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1585  Watercolor of village of Secotan. British Museum.
Historic Neutral Iroquois Settlement Structures

William C. Noble, Professor Emeritus, McMaster University Hamilton, Ontario, Canada

Variations occur in Neutral Iroquois settlement structures regarding their size, shape, and construction. Some of the differences reflect specific socio-economic functions or usages. This paper investigates such questions as: What were the internal refinements? What relationships existed between houses and middens, and when was a house not a home? The Neutral Iroquois, of the early seventeenth century historic era, provide an important case in understanding past Iroquoian socio/political, economic and architectural settlement structures.

Introduction

Modern archaeology has demonstrated that the Iroquoian longhouse architectural style has a lengthy, thousand year ancestry in the Northeast. Indeed, the pole and bark construction technique follows a classic development resulting in the elm bark covered structures with bent "arbour-shaped" roofs familiar in the early seventeenth century. The historic Neutral Iroquois of southwestern Ontario and adjacent New York shared in this long standing architectural tradition ever since their Glen Meyer heritage. However, the belief has not always prevailed that the longhouse was the typical Neutral Iroquois domicile. During the late nineteenth century and into the twentieth, some scholars believed rather differently. In particular, the highly respected Reverend William R. Harris (1895:62) and the historian James H. Coyne (1895:12) espoused the view that the historic Neutrals lived in wigwams, and this interpretation influenced Frederick Houghton (1909:269). Houghton developed a compromise stating that longhouses were the norm for everyday living, while conical teepees were probably erected for short term camps or at the small specialized hamlets. These assumed images were dispelled in 1921-23 when William J. Wintemberg (1939:5-7) first exposed and mapped longhouse post mold patterns at the late prehistoric Neutral Iroquois Lawson village (AgHh-1). However, it was not until June 1969 that an historic Neutral Iroquois structure was first excavated and accurately mapped. This was at the A.D.1615-30 Christianson (AiHa-2) village northwest of Hamilton, Ontario (Figure 1). Here, the structure proved to be a nearly square cabin 5.8 m by 6 m that was atypical of Iroquoian construction only by its short length (Noble 1970:14). Subsequently, this cabin structural style was confirmed at the large towns of Walker (AgHa-9) in 1974 (Noble 1974; Wright 1981), Hood (AiHa-7) in 1977 (Lennox 1984) and the Bogle I (AiHa-10) and Bogle II (AiHa-11) hamlets in 1978 (Lennox 1984). What these historic Neutral Iroquois cabins represent will be addressed herein.

The first actual longhouse of the historic Neutral Iroquois came to light during the fall of 1970 at the A.D. 16401651 Hamilton (AiHa-5) town. With its very orderly interior, House 1 at Hamilton became an expected model for historic Neutral longhouses that was subsequently confirmed at Hamilton in 1972 (Noble 1972; 1984) and again in 1976 (Lennox 1981). The distinctive squared ends of the longhouses were complemented by interior "slash-pits" in parallel sidewall sleeping areas, and end storage cubicles denoted by lateral wall bark stains or upright cedar slats. longhouse patterns from seven historic Neutral Iroquois sites are considered herein (Table 1), and while the square-ended style at Hamilton prevails at all seven settlements, other end styles such as round or tapered also occur at the Thorold town (Noble 1984:10). The trend is clear, however, that the historic Neutral people preferred the simpler, straight-ended longhouse after A.D. 1630.

Also, by way of introduction, one can appreciate that the field recovery of settlement structure information is labour intensive, and open to interpretive problems. Fortunately, the technique of using cross-tape measurements in 15 m or 20 ft squares, popularized in Ontario by James V. Wright (Wright and Anderson 1963), has led to the rapid recording of post and other subsoil features. Cross-sectioning of features also helps determine various measurements, and can usually demonstrate the validity of posts and pits as opposed to intrusive rodent or root action. The problems of determining longhouse contemporaneity and sequence of building structures occurs on historic Neutral settlements just as frequently as it does elsewhere.

The Historic Neutral Example

Several levels of settlement study can be made for the historic Neutral (Noble 1984), but here the focus is primarily upon individual structures within seven communities. In-
Table 1. Excavated Historic Neutral Iroquois Settlement Structures.

<table>
<thead>
<tr>
<th>Site</th>
<th>Longhouses</th>
<th>Cabins</th>
<th>Total Str.</th>
<th>Excavator/Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bogle I (AiHa-10)</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>Lennox, 1978</td>
</tr>
<tr>
<td>Bogle II (AiHa-11)</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>Lennox, 1978</td>
</tr>
<tr>
<td>Christianson (AiHa-2)</td>
<td>8</td>
<td>1</td>
<td>9</td>
<td>Noble, 1969; Fitzgerald, 1979</td>
</tr>
<tr>
<td>Hamilton (AiHa-5)</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>Noble 1970, 1972; Lennox 1976</td>
</tr>
<tr>
<td>Hood (AiHa-7)</td>
<td>11</td>
<td>2</td>
<td>13</td>
<td>Lennox, 1977</td>
</tr>
<tr>
<td>Thorold (AgGt-1)</td>
<td>15</td>
<td>0</td>
<td>15</td>
<td>Noble. 1979, 1980</td>
</tr>
<tr>
<td>Walker (AgHa-9)</td>
<td>9</td>
<td>3</td>
<td>12</td>
<td>Noble, 1973, 1974</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>53</strong></td>
<td><strong>10</strong></td>
<td><strong>63</strong></td>
<td></td>
</tr>
</tbody>
</table>

included are two hamlets less than one acre (0.4 ha) in size, one village covering; one to five acres (0.4-2 ha), and four towns more than five acres (2-6 ha), including the Walker capital town. Noble (1978; 1984:13; 1985:136) identifies Walker with Notre Dame des Anges of the Jesuits, or Ounontisaston, the capital town of paramount chief Tsouharissen. It lies southeast of Brantford (Wright 1981).

Table 1 lists a total of 63 settlement structures that have been fully or partially unearthed and recorded from the seven historic Neutral Iroquois sites. They include 53 long houses and 10 smaller cabins. All sites but Hamilton and Thorold have both longhouse and smaller cabin structures, but no site was composed solely of cabin structures.

The historic longhouses were definitely habitations designed to accommodate large or extended families in communal comfort. Some of the best preserved floor plans come from the unplowed Walker capital town excavated in 1973 and 1974 by Noble (Konrad and Noble 1986; Noble 1984; Wright 1981). The exterior walls exhibited bark disintegration stains well into the subsoil which would provide welcome basal bark insulation against ground-level draughts and wet. In the case of House 12 at Walker, the super-imposition of the exterior wall trenches helped determine that House 12 overlay structure 11 (see Wright 1981:42). Indeed, the bark disintegrations also revealed that the exterior walls of long house 12 had two separated layers of bark, an inner
and outer covering, thereby entrapping an insulating air pocket. Linear wall trench stains are not unique to the historic Neutrals, for they occur on other earlier Ontario Iroquois settlements (Kapches 1980).

The historic Neutral longhouse interiors prove distinctive. In addition to the normal central hearths that divide a longhouse into two linear living sectors, side-wall sleeping areas are demarcated by "slash-pits" (Noble 1984:7). These elongate pits usually contain disintegrated bark, but at the Hood Site, upright cedar slats were encountered (Lennox 1984:17). "Slash-pits" are uniquely Neutral Iroquoian, although not always present in a site's longhouse structures. They have not been reported elsewhere in the Northeast.

The Neutral longhouse interiors usually have a storage cubicle at one end. They are discerned from linear bark disintegration stains, and appear to have been hanging bark curtains shallowly anchored in the house's dirt floor (Noble 1984:7). In addition to being an entrance-storage space. Neutral end cubicles were sometimes used for subsoil primary burial of an important adult with subsequent secondary reburial in an ossuary. Such occurred in longhouse 1 at the Thorold town (Noble 1980:50).

The exterior construction techniques of historic Neutral cabins were virtually identical to those of the longhouses, except that all known cabins have straight ends and one central entranceway. The most graphic example can be seen in house Structure 6 at the Walker Site (Wright 1981:30), where wall trench bark stains delineate the enclosure and western entrance. A long central hearth and other evidence of an activity area along the north side are complemented by a clean space on the other interior side. This parallels the findings within the 1969 Christianson cabin. At Walker, three such cabins (houses 6, 7, and 8) are aligned in a row adjacent to one another in a location that is near but separate from the longhouses.

The contention here is that historic Neutral Iroquois cabins had a different primary function than housing, and this raises the question of "when is a house structure not a home?" The answers could certainly involve different functions such as smoke houses, or sweat lodges. In this instance, the most plausible explanation for differentiation between

![Figure 2. Mean lengths of historic Neutral Iroquois structures.](image)

Neutral longhouses and cabins lies in a fundamental economic mainstay to chief Tsouharissen's polity, namely the white-tailed deer trade. The cabins represent smoke houses for the curing of hides, skins and meat.

Management of white-tailed deer was a primary concern for Tsouharissen's public successes and his trading exploits both north to Huronia and south to Chesapeake Bay. Large quantities of venison, hides and deer by-products (marrow butter, oils, antler) were produced in Neutralia during the early seventeenth century, and French interpreter Etienne Brule related to Sagard (1866:695; 1939:227) that the Neutrals had the custom of drying whole deer carcasses. This has been confirmed archaeologically from midden butchering refuse and detailed faunal analyses (Crerar 1994; Noble and Crerar 1993). It is not difficult to visualize Walker House 6 as a smoke house with central fire, preparation platform on one side, and clear hanging space for deer, hides and meat on the other side.

A consideration of mean lengths helps to differentiate historic Neutral longhouses from the smoke house cabins. Figure 2 clearly shows the length differences between the two structural styles, and normal lengths for the historic Neutral longhouses range between 9.0 and 44.5 m with a mean of 18.2 m, be they at the hamlets, villages, towns or the capital (Table 2).

A trend at the villages and towns occupied between 1615 and 1651 shows a decrease in longhouse lengths, particularly after A.D. 1640 when there were household and
Table 2. Longhouse Measurements at Seven Historic Neutral Iroquois Sites.

<table>
<thead>
<tr>
<th>Site</th>
<th>Length (m)</th>
<th>Width (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>range</td>
<td>mean</td>
</tr>
<tr>
<td>Christianson (1615-1630)</td>
<td>16.5-44.5</td>
<td>26.3</td>
</tr>
<tr>
<td>Thorold (1615-1630)</td>
<td>12.5-1</td>
<td>21.1</td>
</tr>
<tr>
<td>Walker (1620-1645)</td>
<td>9.35-5.5</td>
<td>20.5</td>
</tr>
<tr>
<td>Hamilton (1635-1651)</td>
<td>18.9-28.3</td>
<td>17.1</td>
</tr>
<tr>
<td>Hood (1640-1651)</td>
<td>11-2.4</td>
<td>16.8</td>
</tr>
<tr>
<td>Bogle I (1640-1651)</td>
<td>9.5-14</td>
<td>12.2</td>
</tr>
<tr>
<td>Bogle II (1645-1651)</td>
<td>12.5-14</td>
<td>13.3</td>
</tr>
<tr>
<td>Overall</td>
<td>9.44-5</td>
<td>18.2</td>
</tr>
</tbody>
</table>

overall population depletions due to disease and warfare (Noble 1984:17). As illustrated in Figure 2, two projected longhouse mean lengths occur for the Christianson village. This arises from the inclusion (dotted line) or exclusion of House 6 at that site. House 6 lay outside the northern palisade walls, and as Fitzgerald (1982:51) noted, its 44.5 m length exceeds the historic Neutral longhouse norm. The structure was not intensively occupied, and this coupled with the site date of 1615-1630, prompted Noble (1994:28) to suggest that House 6 at Christianson may have been erected in 1623 to accommodate Etienne Brule, Iroquet, and his twenty Algonkian beaver hunters during their 1623-24 winter expedition to Neutralia. Christianson House 6 is included in the overall 18.2 m mean length calculation.

The largest longhouse at the Walker Site was not completely excavated since it stretched into a neighboring farm field. Located on a high sandy plateau, Walker House 4 was mapped for 35.5 m long by 7.9 m wide, and it dominated the town overlooking an open plaza to its south. It is believed to be Tsouharissen’s family abode and chief’s council house (Noble 1984:11; 1985:136).

Longhouse lengths from the two hamlets, Bogle I and II, definitely fall well below the norm for residences at the larger settlements (Figure 2), but still remain above the cabin range. Perhaps this reflects a response to the specialized nature of an historic Neutral hamlet? The first hand account of Recollet friar Joseph de la Roche Daillon (1866:802) recorded that there were "...several small hamlets of seven to eight houses, built in various locales advantageous for fishing, hunting, or agriculture." Presumably seasonal, these specialized hamlets probably did not require a full extended family work party, and thus the shorter long house lengths?

Cabin lengths for the historic Neutral Iroquois stand in marked contrast to the longhouses at hamlets, villages and

Table 3. Cabin Measurements at Five Historic Neutral Sites.

<table>
<thead>
<tr>
<th>Site</th>
<th>Length (m)</th>
<th>Width (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>range</td>
<td>mean</td>
</tr>
<tr>
<td>Christianson (1615-1630)</td>
<td>6.1</td>
<td>6.1</td>
</tr>
<tr>
<td>Walker (1620-1645)</td>
<td>6.4-7.6</td>
<td>6.9</td>
</tr>
<tr>
<td>Hood (1640-1651)</td>
<td>6.5-8</td>
<td>7.3</td>
</tr>
<tr>
<td>Bogle I (1640-1651)</td>
<td>6.7</td>
<td>6.5</td>
</tr>
<tr>
<td>Bogle II (1645-1651)</td>
<td>6.5-7.5</td>
<td>7</td>
</tr>
<tr>
<td>Overall</td>
<td>6.8</td>
<td>6.8</td>
</tr>
</tbody>
</table>

Figure 3. Mean widths of historic Neutral Iroquois structures.

range.
towns (Figure 2). Indeed, there is a remarkable consistency over time, with mean overall measurements indicating short structures (6.8 m long by 6.2 m) wide as being the norm (Table 3). As earlier contended, it is believed that the short cabins on historic Neutral sites served primarily as smoke houses for the white-tailed deer trade.

Widths of Neutral longhouses and cabins are not as distinctly different as lengths, but generally, longhouse widths narrow over time from 7.4 to 6.6 m, while the cabins remain at near 6 m. In fact, the cabin widths normally measure about 1 m less than those of longhouses at the large Neutral communities, but at Bogle II the mean cabin width closely approximates that hamlet's longhouse widths. Why this is so, remains unclear.

To date, no evidence has arisen to indicate that any of the historic Neutral house structures served specifically as sweat houses. The cabins are invariably removed from ready water sources and quite devoid of any interior fire cracked rock. The only occurrence suggesting possible sweat bath activities comes from the Walker longhouse 12, where an interior hearth held a major concentration of fire-cracked rock (Wright 1981:45). Normally, historic Neutral hearths only have a few smooth rounded “boiling stones” associated.

For this discussion of house structures, the topic of life and death analogies can be addressed. Within the life span of a given community, longhouses damaged by localized fires might be repaired (e.g., Hamilton House 1, southwest wall), or extended (e.g., Thorold House 9), presumably as a response to household growth (Noble 1970b, 1980). However, in some instances, wholesale destruction and rebuilding of houses occurred, and this can present the excavator with a nightmare of interpretations.

To discern the subtleties of structural sequence, one must pay particular attention to cases of super imposed posts, pits, hearths, stains, or trench features. At the Walker Neutral capital town, the presence of superimposed linear wall stains helped demonstrate that House 12 had been built subsequent to the erection and dismantling of House 11. Very confusing house patterns also emerged at the Thorold town in Area A where five longhouses (3, 7, 10, 11 and 12) were all superimposed (Figure 4). Through pit, post, and hearth relationships, it was discerned that House 3 existed first, then was torn down to make way for the four smaller longhouse structures of 7, 10, 11 and 12. Also at Thorold, a pit superimposition revealed that House 1 predated House 6. Such examples demonstrate that there can be a life and death sequence of longhouses on the same site.

Finally, midden refuse can reflect important information about a given house structure and its inhabitants. Not only are dietary preferences revealed and a range of lithic, bone, antler, ceramic and historic artifacts recovered, but the location of middens and discard mends can reflect cleaning habits for a particular house. At Thorold (Figure 4), the presence of House 1 was predicted and confirmed after the excavation of middens 3 and 8. Distanced 20 meters apart, each midden yielded ceramic rims from the same pot. The inference was that a longhouse lay very near the middens, and that portions of the same broken pot had been cleaned out both end doors of the structure. Professor J. N. Emerson (personal communication, 1962) also encountered this “midden mend” phenomenon during his 1951 excavations at the Benson protohistoric Huron Site, Bexley Township, Victoria County. Significantly, no midden associations have yet been made with historic Neutral cabins. Deer were roasted whole, but not butchered in or near the smoke houses. All axial and distal deer skeletal units appear in middens associated with longhouses (Crerar and Noble 1995).

Conclusions

The following overviews can be summarized briefly concerning historic Neutral Iroquois settlement structures.

1. Longhouses, not teepees, were the normal household domiciles and shelters.
2. Longhouse lengths range between 9 and 44.5 m, but decrease noticeably after A.D. 1640 to under 29 m maximum. Their widths also narrow, by 1 in.
3. Longhouse shapes normally have squared ends, except at Thorold where rounded ends and variations are known (Noble 1984:10).
4. Interiors of Neutral longhouses are normally very orderly, with central hearths, and end storage cubicule, and “slash pit” sleeping areas along the sides.
5. Exterior walls of longhouses were ingeniously insulated, sometimes with double bark layers, and anchored into the subsoil to prevent moisture and draughts.
6. Longhouses are clearly distinguishable on the basis of size from cabin structures. Cabins invariably measure shorter, with mean lengths of 6.8 m and mean widths of 6.2 m. They are very nearly square structures.
7. The cabins did not function as sweat lodges, and only rarely as domiciles. They served primarily as smoke houses for the Neutral white-tailed deer trade.
Figure 4. Map of Thorold Site (AgGt -1 ).
8. As a function of normal life and death cycles, some Neutral Iroquoian households needed extra space, and hence expanded their living structures. At other sites, there are records of house dismantling and rebuilding, which can present difficult interpretations if the held record of superimposition is not clearly watched.

9. It is noted that refuse middens are not associated with all house structures on historic Neutral Iroquois sites. In particular, none have yet been associated with cabins, only with longhouses.

10. Finally, house structures can serve a variety of functions. For the historic Neutrals, lodgings and smoke houses appear primary, while secondary uses would include council meeting places, primary burial repositories before secondary interment, perhaps sweat lodges, and during the final years of the polity, the houses would no doubt be the last defensive units available.

Acknowledgements

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Wright, Milton J.
Compete excavation of the early seventeenth-century Huron Ball Site has revealed all of the 71 structures that existed on this 3.6 ha site. Analysis of those structures indicates that great variation exists among them, which may be due to different functions, and that the term "house" should be used advisedly. Ultimately it is argued that there is a need for more complete excavations of Iroquoian sites in order to ascertain function.

The Ball Site is an early seventeenth-century Huron village located about 10 km west of the modern town of Orillia, Ontario (Figure 1). Research began at the site in 1975 and continued until 1999 when the last square was excavated. The site has been completely excavated exposing 71 structures, numerous middens both inside and outside the village as well as a two-stage palisade completely surrounding the 3.6 ha (9 acre) settlement (Figure 2). This paper will discuss our findings concerning these native structures as exemplified from the sample at Ball. My purpose is to quickly review the structures found on the site and to examine our interpretation of their functions. More specifically, I wish to explore if they all represent "typical" longhouses-the matrilineal, multi-family living structures with central corridor hearths, side wall benches or sleeping platforms, end storage cubicles, doorways at the ends of the house, and interior support posts which have been described in ethnohistoric literature (Heidenreich 1971), or if they perhaps serve some other function(s).

In previous papers I explored this topic but reached no definitive conclusions (Knight 1987, 1989) and in fact there may be no such answers to be found. However, as I have been able to excavate all of the houses from one site, I feel that it is important to point out that the structures from the Ball Site do exhibit a variety of forms and therefore it can be anticipated that such range variation might exist on other Iroquoian sites as well. The question to be raised then is exactly what constitutes a "typical" longhouse (Dodd 1984:25). When an archaeologist has only a sample from a site, does that sample reflect the typical houses or the atypical ones? A photograph from Onondaga Iroquois Prehistory (Tuck 1971:82) shows three very different structures from the Howlett Hill Site side by side. Kapches (1984) defines Longhouses," "short longhouses" and "cabins" as structures found on Iroquoian sites. Certainly at Ball there does not appear to have been any one "model home" that fits all. Table 1 lists the statistics for all the structures from the site. While there are at least two common characteristics for each of the structures at Ball, there is a striking range of variation among the structures. The traits common to all are: house widths and wall construction methodology. The house widths of all structures at Ball are always very close to seven meters (21 ft) plus or minus a few centimeters (or inches). The wall construction method that is universally used is a single row of alternating posts. It should be noted that the site had been extensively plowed so that while the wall and interior post molds and features are quite obvious, the actual living floors have been removed and hearths are not readily apparent during excavations.

The greatest variations among these houses are found in their lengths, end shapes, and use of interior space. The lengths of the structures at Ball vary from 6 to 39.2 m. The shapes of the ends of these buildings may be flat, curved or irregular. Furthermore, interior spatial patterns vary from there being no pits to many pits, and from a few interior posts to many interior posts. Kapches (1990, 1993), in a number of articles about longhouses, has raised some interesting questions concerning our past analyses of these buildings. She has suggested a methodology, known as spatial dynamics, by which it might be possible to obtain better quantitative data from our work. Her synchronic and diachronic analyses of some of the Ball Site houses suggests that "Ball is a site that exhibits less social control and more structural variability" than the earlier Draper Site (Kapches 1990:65). At a more basic level of analysis, however, we are still faced with the issue of function.

The dilemma of determining function is as old as archaeology itself and remains as problematic today as ever. As difficult as it may be to ascertain, however, there is some consensus that we must at least try to make such interpretations. How else will it be possible to explain the range of variation that is found among the structures on the Ball Site? The hard evidence is based on ethnohistoric and ethnographic accounts (Bigger 1922-1936; Tooker 1964). The hard evidence comes from archaeology; primarily from the
Figure 1. Map showing location of the Ball Site, a Huron Village near Orillia, Ontario, Canada.
Figure 2. Settlement pattern at the Ball Site.
<table>
<thead>
<tr>
<th>House Type</th>
<th>Length (m)</th>
<th>Width (m)</th>
<th>No. of Features</th>
<th>No. of Interior Posts</th>
<th>No. of Wall Posts</th>
<th>House Type</th>
<th>Length (m)</th>
<th>Width (m)</th>
<th>No. of Features</th>
<th>No. of Interior Posts</th>
<th>No. of Wall Posts</th>
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<tbody>
<tr>
<td>III</td>
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<td>7.2</td>
<td>40</td>
<td>112</td>
<td>155</td>
<td>II</td>
<td>12.8</td>
<td>7.0</td>
<td>15</td>
<td>46</td>
<td>136</td>
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Table 2. Houses by Types.

I  12, 45, 47, 57, 59
H  5, 7, 8, 17, 18, 30, 37, 38, 42
III 1, 2, 4, 6, 16, 24, 28, 31, 32, 34, 35, 40, 41, 43, 46, 49, 53, 54, 58, 65
IV  3, 6, 9, 10, 11, 13, 14, 19, 20, 22, 23, 24, 25, 26, 27, 29, 33, 36, 39, 44, 48, 50, 52, 56, 60, 61, 62, 63, 64, 66, 67, 68, 69, 70, 71
size, shape and interior of these structures (Knight 1987, 1989; Dodd 1984; Kapches 1979, 1984, 1990). These include lengths, widths, numbers and locations of pits, hearths, interior post molds, bench lines, porches, vestibules, partitions, doorways, and associated artifacts. The placement of the structure within the broader context of the village is a factor which can also be considered.

My argument is that the size of structures and the organization of their interior space will be a reflection of the activities that have taken place in them. The basic assumption of this type of spatial analysis is that artifacts "classified into separate tool types, should be differently distributed on prehistoric occupation floors as a result of their differential utilization in the various separate activities carried out by human groups at each location used or inhabited" (Whallon 1973:115). Certainly today we have rooms within our homes that are organized in different ways to reflect the functions that take place in those rooms. As well, we have such structures as work shops, garages, tool sheds and pool houses which are often separated from the living house. All of these may have quite different functions and therefore are organized in quite different manners. Also, the artifacts that one would anticipate finding in each structure would be quite different. Could not the same thing be the case for Huron society?

In general, ethnographic descriptions indicate very little about house function beyond their role as living structures, although there are mentions of them as meeting places for feasts, places visitors are welcomed, curing houses for the sick, places for blessing of nets, places for sweat lodges and places to keep captive bears. There are distinctions made concerning the chief's house, which is longer, as well as indications of shamans' structures, and possible structures used by wintering Algonkians and other non-Hurons (Biggar 1922-1936; Heidenreich 1978). One source (Nabokov and Easton 1989:83) notes a smaller, two family dwelling called a ganosote, or bark house, which was "probably the core structure for many extended longhouses and may have been more commonly built than popular accounts of Iroquois society suggest." Beyond these few sources, however, there is very little information available concerning the actual function of structures.

Drawings of longhouses from ethnohistoric accounts and maps have to be used very carefully as they are notorious for indulging in artistic licence in their representation of the Iroquoian structures. Drawings of villages represent the longhouses as being all the same (see Trigger 1976: 310 for an example of this impression supplied by Champlain). A recent discussion by Wright (1995:9-22) about the construction of the longhouse points to the difficulty of using these graphic and ethnohistoric examples to interpret these structures above the post mold level. For this paper I have separated the structures from Ball into four different types based on the organization of the features and posts molds within each structure. It is assumed that the organization of features and posts bears some relationship to the activities which took place in the structure (note Whallon 1973:115 quoted above). And Rapport (cited in Kent 1990:3) states that "once the issues of scale and comparability have been solved, the built environment, features within it, and use of space-systems of setting and cultural landscape-are the result of highly culture-specific and at times temporal-specific designs." He further points out that "activity settings guide behavior through other people's activities and through semi-fixed furnishing or features (elements) that act as cues" (Kent 1990:3). Features on Huron sites can be interpreted as storage pits, refuse pits or hearths. Interior post molds differ from wall posts in that they are generally smaller in diameter and not as deep. These are interpreted as representing temporary activity areas (cooking, hide drying, etc.), internal ceiling supports, partitions, and bunk line supports.

The types defined here are those found at the Ball Site and no attempt has been made at external comparisons. Briefly the four types defined from Ball are: Type I structures have few or no features and few interior posts; Type II have features and interior posts located along the outside walls of the structure; Type III have all the features and most of the interior posts located along the mid-line axis of the structure; Type IV have features and interior post molds scattered throughout the structure, including next to the walls as well as along the mid-line axis. The statistical data for each house and its placement within a type is given in Tables 1 and 2. Figure 3 shows the distribution of each house type across the village; however, this distribution is not dealt with here.

Discussion

Although the definition of these groups is somewhat subjective, there does appear to be some consistency within the Ball Site. While it is obvious that, at certain levels, every house may be considered to be different from every other house, it does seem possible to group them together into site types based on the similar traits of features and interior posts. While other traits could be used as well, it would seem to be logical to assume that these particular traits (features and internal posts) are good indicators of activities and therefore function. It is still an open question as to whether or not these types might be useful in discussing the functions of the structures found on Iroquoian sites beyond the Ball Site.
Figure 3. House types at the Ball Site.
These structures are characterized by a lack of interior features and posts. The five structures (Table 2) in this category vary in length from 3.2 to 18.4 m and in width from 3.0 to 7.8 in. They have either no or very few pits (n=0 to 8) in them and when pits are present, they are small. There are few interior posts (n=4 to 83) that are scattered in an apparent random fashion throughout the structure. Wall constructions are generally consistent, with some minor variations. There do not appear to be any defined storage areas in any of these structures. Bunkline posts appear in only one. Four of these would be classified as cabins (Houses 12, 57 and 59) according to the definition by Kapches (1984).

Possible functions

The lack of pits in the structures of Type 1 suggest that these were not houses in the traditional sense but perhaps storage or ceremonial structures which did not require any in-ground storage pits or garbage disposal. The small number of interior posts in the smaller structures (Houses 12, 57 and 59) could be interpreted as representing a paucity of activity areas within the structure. Additionally, the lack of posts may indicate a low need for roof support posts, as a smaller structure may not have had the same construction require-

Type II (Figures 5, 6 and 7)

These structures are distinguished by the fact that all the features are located along the walls or concentrated at one end leaving the central axis of the structure free of features. There are only nine structures in this Type (Table 2). They vary in length from 7 to 38.2 m and width from 5 to 7.8 m. The wall construction is solid and consistent with ends that are always straight. While all have storage areas, three have storage areas only at one end. In general, the number of features is low (n=2 to 10). The number of interior posts varies widely but tends to be fewer than are found in Types III and IV (n=5 to 168). Bunklines can be identified in all. Four of these (Houses 5, 30, 42, and 64) would be considered cabins per Kapches (1984) categories while one is the second longest structure (House 17) on the site.

Possible functions

Pit placements along the side walls suggest that these structures all have similar functions that distinguish them from
other structures on the site. The issue of the open areas along the central axis of the structure is perplexing. It is conceivable that the structures of this type were occasionally home to ceremonial or socio-political activities which took place along their central axis, thereby necessitating the placement of features along walls. Given its length, and the distribution of its features, House 17 could be interpreted as a chief’s house.

Possible functions

On the basis of its size, and in keeping with the ethnohistoric record, House 20 would likely be interpreted as a chief’s house. In contrast to House 17, however, the presence of features along its midline would seem to make it more difficult for social and ceremonial events to have been hosted there. Indeed, most of the structures in this category have the traits that are associated with the “typical” longhouse (Dodd 1984:25) with activity areas, hearths and features located along the central axis of the house.

Type IV (Figures 10 and 11)

The structures in this category all have features and posts that appear to be randomly situated throughout the building (Table 2). The features are scattered throughout the structure both along the walls as well as along the midline axis. The structures in this type vary in length between 3.8 and 34 m and in width from 6 to 7.2 m. The number of features in each structure (n =3 to 75) is generally greater than that found in the other types. In many cases the pits overlap one another. All have feature-free storage areas located at both ends. Bench lines are noted in some houses but not in all. When bench lines are present they appear only on one side. Interior posts (n=8 to 258) are concentrated near pits along the midline. In some there are obvious partitions separating the storage areas from the mid-section of the structure. Again using Kapches’ (1993) criteria, one of the structures within this type would be considered a cabin (House 56).

Possible functions

Most of these structures appear to conform to the ideal of the "typical" dwelling on-house, as formulated by the current archaeological and ethnohistoric literature. The presence of large numbers of discrete and overlapping features suggests that these structures were occupied for longer periods. Both storage and refuse features are noted within this type. Generally these structures have more interior posts than are found in the other types and again they tend to be concentrated around the features, suggesting a correlation of function between these two traits. The lack of bench lines along one side is of interest in relation to the placement of family groupings, or at least sleeping areas, only on one side.

General Discussion

Archaeological evidence from the Ball Site suggests that the structures found on Iroquoian sites may have fulfilled different functions. This hypothesis is based on the as-
Figure 7. Ball Site House 18, Type II.
Figure 8. Ball Site House 4, Type III.
Figure 9. Ball Site House 21. Type III.
assumption that the organization of the features and posts inside the structures are a reflection of the activities which took place in those structures during their occupancy. At the Ball Site there appears to be at least four distinct ways of organizing the interior space within buildings. Preliminary analysis has not confirmed that these structures had separate functions or what those functions might have been. It is suggested that a more detailed examination of additional traits, such as the analysis of associated artifacts contained in features, will aid in the search for function. Use of Kapches' (1990) spatial dynamics model is another tool which may help in this quest as well.

**Figure 10.** Ball Site House 10. Type IV.

**Conclusions**

In conclusion, work from the late prehistoric Iroquoian Ball Site has demonstrated that there is a great deal of variation in the structures found on this site and that there is not a "typical longhouse." This work has made us aware that the range of variation among Iroquoian structures (longhouses) is far greater than the ethnohistoric record would lead us to believe. As the Ball Site sample comprises 100% of the structures that existed on the site, our work suggests that, in order to deal with the function of these structures, it is necessary to excavate completely more Iroquoian villages, ex-
Figure 11. Ball Site House 6. Type IV.

Posing all the structures contained therein in order to view the entire range of variation that existed. Observing only a select sample of structures from any site may give a false impression of the range of variation. Without an appreciation for that range of variation, it will be impossible to determine the function of these structures.

Acknowledgements

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Wright, J. V.
Kidd's "Chapel" and Its longhouse Origins at Ste Marie Among the Hurons

Mima Kapches, Royal Ontario Museum, Toronto, Ontario, Canada.

A re-examination of the archaeological data from the ROM's excavations of the "chapel" by Kenneth F. Kidd at Ste Marie I is presented. Evidence of the chapel being built first as a small longhouse and then being rebuilt using more traditional French techniques, but retaining close architectural and symbolic morphology to an Iroquoian longhouse, is discussed.

Figure 1. Detail of plan of the chapel showing post molds and stonework from Map 10 (Kidd, 1949). The bastion is at the top of the figure and contiguous with the building. A fireplace is at the top of the building. Dimensions of the building are about 20 ft wide by 40 ft in length.

Introduction

This paper is an examination of one structure at Ste Marie I excavated by Kidd in 1942 which "From its location, size and internal characteristics, this building is considered to be the chapel" (Kidd 1949:53). Based on the archaeological evidence and its architecture, this is a building with a large open space suitable for a congregation to gather for ceremonial purposes, which could have been used as a chapel. The occupational debris in the building does not suggest a residential function. However, it is possible that the building had multiple functions over time. In this paper, comments about the building will focus on evidence for its initial and second constructions. The architecture of the building in relation to traditional Iroquoian longhouses will also be discussed.

Architecture, along with other elements of material culture, is an important indicator of cultural change. On Iroquoian archaeological sites with evidence of European contact, aspects of architectural interaction include buildings with squared corners and rectangular spaces indicative of vestibules (Kapches 1994a). These are not typical native architectural features and suggest European admixture.

But just as Iroquoian sites occupied during the contact period can be examined for elements of European architecture, the architecture at Ste Marie, as documented by Kidd's excavations and published in The Excavation of Ste Marie I (1949), can be examined for indications of native architecture. Indeed, the archaeology of Ste Marie does indicate the use of native construction systems, especially in the chapel. This evidence will be reviewed in the discussion to follow.

Kidd's Description of the Chapel

The description of the chapel is based on the published report and an examination of the notes and the photographs currently held at Ste Marie Among the Hurons. Although Kidd was a curator at the Royal Ontario Museum when the excavation was conducted, the artifacts, field notes and plans were given to the museum at Ste Marie Among the Hurons and are currently curated there. The best information concerning the chapel is from the published text, as the field notes were not overly descriptive. The archival information
from the floor plans and the photographs was useful. The chapel was excavated in 1942 (Figure 1). It ran north to south along the western edge of the central Jesuit residential area. To the west of the chapel there was a drainage ditch, the moat. The situation of Ste Marie, in a low-lying area near the river Wye, was such that it required constant drainage. The chapel's north end was contiguous to the northwest bastion, with a doorway from the bastion into the chapel to the west and another doorway to the west, skirting both ends of the fireplace along the northern wall.

Kidd suggested that the walls of the chapel and the building to the south, the "residence," may have been continuous. Based on the post mold data, there was a space between these two buildings to allow for entry to the central compound. This entrance could be gated or barricaded. The walls of the chapel and the residence provided an exterior wall which, when coupled with the drainage moat, provided an effective barrier to the private area of the residence.

The Chapel

The walls of the building were defined by wooden sills and post molds (Figure 1). A double row of post molds was found below a wooden sill system in some wall sections. In the interior of this building were two rows of regularly spaced large flat stones, north to south, along the east and west walls inside the structure. These were of limestone, and although undressed were relatively flat and averaged about 14 in. in diameter. These "stones undoubtedly were placed in their present position, either to carry roof supports or wooden columns" (Kidd 1949:54). There was no wooden floor in the chapel; instead there was an earthen floor (Kidd 1949:57).

The fireplace was at the north end of the building, and was shallow in comparison to others at the site. It was designed to heat the building and the bastion to the north. Although there was a layer of ash containing numerous bone fragments associated with the fireplace, it was not heavily used and may have been "built late, and... used with the hearth unfinished" (Kidd 1949:57-58). The food remains from the hearth and the south end of the building were found in the lower levels and Kidd suggested that they may "antedate its erection" (Kidd 1949:58).

In his discussion of the chapel, Kidd stated that "the (artefact) inventory does not reveal anything which would conclusively point to the use of the building as a chapel; there were no crucifixes, altar pieces, or other religious objects" (Kidd 1949:58). According to Kidd, "it appears... to have been a one-storey structure, if the scattered boards came from the roof as supposed. Position, size, and height point to its being the most suitable for chapel use" (Kidd 1949:61). Kidd noted that this identification was "purely tentative" (Kidd 1949:59).

The Construction and Use of Ste Marie

The construction of Ste Marie began in 1639 with occupation by October of that year. In the Jesuit Relations it states that they are building "a single house which is to be firm and stable" (JR 19:135), and that:

"We are now labouring to establish ourselves here, and to erect some abode reasonably suitable to our functions; but that is done with pains that it would be difficult to explain-having no help or assistance from the country, and being, withal in an almost universal dearth of workmen and tools (JR 19:135)."

By 1643-1644, four and five years after the initial establishment of Ste Marie, the number of buildings present on the site had increased:

"This house is not only an abode for ourselves- but it is also the continual resort of all the neighbouring tribes... we have, therefore, been compelled to establish a hospital... a cemetery... a Church for public devotions, a retreat for pilgrims... (JR 26:201)."

Throughout the history of the site, from an initial construction period with limited human and material resources, the site was greatly expanded. It is apparent from reading these documents that the construction history of the site was complex. Certainly, reading the excavation accounts of Kidd (1949) and Jury and Jury (1954), this is apparent.

"The Structural Nature and Function of the Jesuit Mission Centre of Sainte-Marie (1639:1649) (Russell 1961) is quite informative concerning the development and the history of the site. Ste Marie was:

the central residence for their religious community and to be a center for the dissemination of religion with the necessary attendant services. They never considered Sainte Marie a fort (Russell 1961:2).

Russell observed that the missionaries first built, or had the natives build for them, dwellings in the native manner in the native villages. From these they conducted their missions, and in these structures they lived while they were in the native communities. This living in villages "was a Jesuit missionary technique designed to enable them, in hierarchical societies, to contact and influence the leaders and the upper classes" (Russell 1961: fn 16, p. 9).

The developments and changes in the architecture of the site during the years of its existence are discussed:
Because some of the buildings overlapped earlier features, Sainte Marie may very well have been modified according to changing conditions, but construction details indicate that even prior to 16-44 the residence was growing over a far wider area than that encompassed by the parallelogram which is a relatively small portion of the whole complex" [Russell 1961:25].

Russell strongly argued against a militaristic function for Ste Marie and argued instead that it was a residence with the fortifications being built later. Also, that "to think of these "fortifications" as much more than barricading and perhaps sealing off sections of the residence would be an exaggeration" (Russell 1961: 34-35).

The residence served as a place where the Jesuits could make their spiritual retreat, and there were enough missionaries present for "a regular Jesuit house and as such cloister was enforced and a regular timetable drawn up" (Russell 1961:67). From Russell's analysis it is apparent that the view of the central area of Ste Marie, the area excavated by Kidd, becomes the central residence for the Jesuits.

Concerning the construction sequence Russell notes that at first there was only one building at Ste Marie (Russell 1961:71; JR XIX. 149, fn 35). He suggests that for this first building the "obvious choice was a longhouse like those of the savages, without interior partitions, except for the chapel" (Russell 1961:71). For this "first" building Russell selects Jury's longhouse, located to the west of the central residence and argued by Jury as the "first home" on the site. Unfortunately, no plans have been published for this building and it is only vaguely described (Jury and Jury 1954:21 ff).

Actually it is unnecessary to look outside the core residence area for a potential first building. A native-built initial structure is present and archaeological evidence for it exists in the early construction of the chapel. The chapel changed over time, and its use probably changed during the life of Ste Marie. Initially it was used by Jesuits and Christian natives. Eventually, a church was built for the non-Christian natives and services were held there. The hospital and this church were built beyond the narrow confines of the Jesuit enclave. Over time, the use of the chapel may have become more focused on the needs and requirements of the Jesuits, but before this church was built the chapel served for religious services for both Jesuits and Christian natives.

**A Discussion of Piquet, Poteaux en Terre, Pièces en Terre and Sur Sole**

**Construction**

One interesting aspect of the construction of the chapel is the presence of post molds defining the walls of the structure. In the historic archaeology literature there has been much discussion of the origins of the "post in the ground" construction (variously described as *piquet or poteaux en terre, pièces en terre*). Kniffen and Glassie (1966:48) discuss the native origins of this technique:

> In the attempt to account for the prevalence of vertical construction among the French in America it has been suggested that it was inspired by Indian vertical post stockades or palisades and buildings...[Kniffen and Glassie 1966:48].

But these authors reject this origin and suggest instead vertical post construction of palisades and buildings reaches back to the European Neolithic, it would seem unnecessary to seek further for explanation of its American incidence... (and) that a method of construction which was very old and largely vestigial in western Europe experienced a brief rejuvenation in timber-rich colonial America [Kniffen and Glassie 1966:48].

Peterson in "The Houses of French St. Louis" traces the "palisaded" house walls along the French fur-trading routes. He states that "for a long time [I] was unable to trace this construction type as far as lower Canada," but was eventually able to record its presence back to 1673 near Montreal (1965:33). Peterson continues to discuss the presence of this type of construction from Placentia, Newfoundland to Louisbourg. Krause (1974) associates the origins of this technique with the arrival of colonists from Newfoundland, saying that the relative ease and limited expense of building with *piquets* made it the earliest construction choice.

Archaeologists who study native architecture of the Northeast know that the European Neolithic argument can be rejected. Instead, the origins of "post in ground" can be found in native construction throughout the northeast. In the case of Ste Marie I. the post mold pattern is identical to the double staggered row of posts typical of the walls of an Iroquoian longhouse (Figure 2). This construction method was broadly adopted by Europeans because, as Krause (1974) states, it was easy and less costly.
There are posts at Ste Marie which do reflect a European construction technique. As Kniffen and Glassie state, "one improvement is the placement of the vertical members sur sole (on a sill) rather than en terre" (1966: 47). The reason for doing this is that the sill deters the decay of the posts in the ground. The use of a sill was not a native technology in the northeast. At Ste Marie the storage pit excavated by Kidd was constructed in this manner (Figure 3). Four cedar logs were hollowed or grooved and the stakes forming the walls of the pit were "driven into the logs... (and) were made from poles with the bark still on, sharpened at one end" (Kidd 1949:62-63).

However, the sill recovered in the chapel was different. Instead of the sill being below the posts, the posts were below the sill. To explain this, Kidd argued that "these stakes had supported the sills off the ground to keep them from too rapid decay" (1949:53). This sill system was present on the western side of the building and with limited evidence on the south and east side. This is an unusual argument, it seems more likely that the posts in the ground represented an initial construction of the building. Therefore, in the first building, the posts placed in the ground decayed and these were replaced by the sill and post system in a subsequent rebuilding event.

The photographs of the Ste Marie excavation show the profiles of the excavation of this feature, with the widely

**Figure 2.** Double row of post molds from the wall of the chapel.

**Figure 3.** The sill and post construction of the storage pit at Ste Marie.
spaced post molds below and terminating at the wooden sill (Figure 4). What is clear from this photograph is a buried soil horizon below the sill. This soil horizon supports the interpretation that there was an initial building phase of this building, a phase in which the walls of the structure looked like those of an Iroquoian longhouse, and that this phase was replaced by a sill and post wall system (Figure 5).

**Similarity of Form and Function: An Iroquoian longhouse and the Chapel At Ste Marie**

An Iroquoian longhouse is a residence occupied by several matrilineally related families. Hearths are located in the center of the house along the central axis, two families share each hearth, with each family having personal space on their side of the longhouse. The sides of the houses have benches built into them on which partitioned apartments were constructed, thereby allowing each family to have private space in the large and largely open communal house (Kapches 1993). All aspects of human existence occurred inside the house, including religious ceremonials. The loca-
tion for major ceremonials in a village was usually the longest house, the home of the chief, and these ceremonials Usually took place in the larger centrally positioned apartments in the house (Kapches 1994b). There are no specially built religious structures in an Iroquoian village; these activities took place inside the longhouse.

Longhouses are usually about 25 ft wide and vary, in length depending on the number of families occupying the house. Inside the longhouse, the interior support posts framing the superstructure are situated along the side of the house where they support the side wall benches. This arrangement leaves the central place of the house available for living space, including ceremonials.

Kidd did not interpret or speculate on the interior space of the chapel. The overall dimensions of the building are small, c. 40 ft by 20 ft (800 sq ft). At the north end of the building is the largest open space, c. 500 sq ft which would have been the area fit people to congregate. Along the length of the building are two parallel rows of flat stones along the side walls, these are the location of support posts for the roof. These support posts are positioned close to the exterior walls at a distance of c. 2.5 ft. Their location allows for the interior space to be unimpeded. This building, in contrast to the "residence" to the south, is ideally suited for a religious function?

Is the chapel similar to a longhouse? The overall layout suggests the interior of a longhouse, but not an exact interior. Similarities consist of the long narrow space, the side wall post construction, the dirt floor, doors located at the end, no clear evidence of windows (square 83K1, 2 fragments of glass), and support posts located in parallel lines down the sides of the house. Differences include the lack of residential space, no side wall benches or apartments, and no hearths along the central axis. In this building the ceremonial corridor of the Iroquoian longhouse exists but the residential function (with side apartments) has been eliminated.

Discussion

Architectural morphology is the tracing of the merging of different architectural styles due to cultural conditions. Hanlon (1992) discusses the convergence and the fusion of the European Christian church and the Pueblo religious structure, the kiva. The main thrust being that the convergence of two different religions in a structure which incorporates spatial, ceremonial and architectural details of both religions' sacred buildings, facilitates the convergence of religious philosophies. As Hanlon states:

In the construction of mission churches... the severe limitations imposed by available materials ... and by native labour necessitated a divergence from that of the original European church model. This is indisputable since we can easily observe a close affinity in material and building technique between the mission churches and nearby pueblo architecture. However, the emergence of a church form suited to the specifics of life in the Southwest is rooted in something even more fundamental than material and technique. It is conceptual in nature, a sense by the people of that time and place of what was appropriate for sacred space in a traditional Indian Culture 1Hanlon 1992:2061.

Elsewhere in the Americas archaeologists have examined construction of buildings by Europeans, including clergy, in situations of a new culture and different and unusual (to the Europeans) building techniques. As Kubler states, in seventeenth century New Mexico, there were no architects it had brought building knowledge so that the:

Friars were left to their own devices, with the result that each missionary established the program, evolved the design, and super-intended the construction and decoration of the church at his post [Kubler 1972:7].

Thus, he says that:

A closer examination of the older monuments reveals their construction as an unusual feat of European adaptation to limited materials and aboriginal technique [Kubler 1972:xiii].

The chapel at Ste Marie, by virtue of its architectural layout and initial construction is very similar to an Iroquoian longhouse. As such, it allowed for the blending of sacred spaces of two very distinct cultures. The chapel was a small space, not wide or long enough for a residential or ceremonial longhouse but it incorporated the spatial dimensions of a ceremonial core area of the traditional longhouse.

Conclusions

The first building at Ste Marie I, built with native and European labour, was constructed in the architectural form most familiar to Iroquoians, the longhouse. Although first used for multiple purposes, both residential and ceremonial, it is likely that the second stage of construction was for religious purposes. In subsequent construction, the "post in the Ground-typical for longhouses, was replaced by posts set into a wooden sill. Still the layout of this second building mimics that of an Iroquoian long house. With internal dimensions which would have been comfortable for Iroquoian
converts, longer than wide (c. 20 ft wide by 40 ft long), with regularly spaced internal support posts, similar to the internal support posts of their longhouses.

The use of native technology for the first building at Ste Marie I was expedient. The Jesuits needed buildings constructed quickly and efficiently. That the architectural morphology of this building was culturally and ceremonially significant for Iroquoians was possibly known by the Jesuits, who were aware that native cultures must be understood to facilitate teaching.

Architecture, like other elements of material culture, also changed with culture contact. As Natives met Europeans, the architecture of both was affected. Initially, Europeans relied on native technology and design, but gradually they added their old country architectural features. The site of Ste Marie offers a unique opportunity to examine the impact of different architectural and symbolic traditions meeting.

Acknowledgements

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The Internal Organization of Iroquoian Longhouses: A Response To Crowding?

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Iroquoian longhouses have family apartments constructed along their sides. These architectural features provided private space for families. Social psychologists argue that the presence of private interior structural features in highly populated structures (such as dormitories and prisons) leads to less psychological stress. This research is of interest when theorizing about life in the longhouse.

Introduction

In an earlier paper I discussed the increase in internal organization of Iroquoian longhouses over time (Kapches 1990). In Ontario the precursors of longhouses are small elongated houses, oval in outline, and are thought to be extended family structures. The presence of permanent interior architectural features which control the positioning of people and families is variable in these early houses. However, by the classic period of Iroquoian culture in Ontario and New York state (c. A.D. 1250 to A.D. 1650) longhouses have a high degree of internal regularity. The longhouses are laid out with architectural precision which could indicate the formalization of the rules of matriliney.

Since that paper, three other points with regard to Iroquoian longhouses have been postulated: first, that Iroquoians had a unit of measurement which they used to plan and build longhouses (Kapches 1993); second, that by recognizing this unit of measurement it is possible to identify in some longhouses the physical presence of bilaterally symmetrical apartments along both sides of the longhouse (Kapches 1993, 1995a); and third, that the larger apartments in the central area of the longhouse were the area of the house occupied by individuals of higher status and were the location where ceremonial events would have occurred (Kapches 1993, 1995a, 1995c).

In one paper it was postulated that the move into large multiple family dwellings, along with the intensification of subsistence systems, and the concentration of many people in large villages for an extended period of time, created severe stress for Iroquoians (Kapches 1995b). This stress resulted in unstable political and social systems. How can one prove stress? The increased presence of butchered human remains? We have always argued that these indicate extra-village warfare, but could they indicate intra-village stress?

All in all, since it is likely impossible to support these hypotheses, they will continue to remain conjectural and controversial. It may be, however, that there were architectural remedies which alleviated stress?

Studies on Human Responses to Crowding

The research of social psychologists on the effects of crowding and architectural variables which can alleviate the stress generated from crowding leads to interesting data which can be considered in the discussions concerning the development of the longhouse. A study of overcrowding in an urban Chicago environment is of interest (Galle et al. 1972). Obviously the modern urban community is not identical to that of the Iroquoian community of the past, but when considering crowding there are some similarities. The differences are that modern communities consist of people from different ethnic and economic backgrounds, people who are unrelated and do not share socio-cultural values, whereas in the past, Iroquoian communities were homogeneous, the members of the community were related, and they shared socio-cultural values. Although these are significant differences, there are aspects of the study which are relevant. This study investigated the effects of density on mortality, fertility, ineffectual parental care, juvenile delinquency, and psychiatric disorder (Galle et al. 1972). Of these only mortality and fertility are considered for this discussion. They found that overcrowding leads to poor health, increases the transmission of disease, and ultimately results in higher mortality. Concerning fertility, they found that contrary to animal studies, high density increases the birth rate. The authors stated:

As the number of persons in a dwelling increases, so will the number of social obligations, as well the need to inhibit individual desires. This escalation of both social demands and the need to inhibit desires would become particularly problematic when people are crowded together in a dwelling with a high ratio of persons per room [Galle et al., 1972:28].
The most important components of density were the number of persons per room and the number of housing units per structure. Certainly, this study has implications for life in a longhouse. Stress, although not archaeologically recognizable, would have been a factor in the increased number of persons inside a larger house, and increased disease and birth rates (Warrick 1990).

What anthropological studies of crowding by anthropologists are available? Draper (1973) studied the !Kung Bushmen. This band-level society's seasonal communities are widely dispersed over a large territory. In the seasonal, temporary settlements, people of all ages live in very close proximity without adverse physical and psychological stress. In this society, if there is stress through conflict, the group fissions and people move long distances to join other groups.

Although this society is not directly comparable to the Iroquoian situation, it does have stimulating theoretical possibilities when considering the transition to horticulture in the Middle Woodland period. Perhaps crowding was a factor in hunter-gatherer native communities and when stress became manifest, it was managed by group dispersal? If this dispersal system of stress resolution functioned in a non-sedentary society, what occurred in a sedentary society? With changes in economy and social systems, different stress resolution mechanisms develop, such as architectural mechanisms (stress resolution mechanisms being social as well as architectural) (Draper and Cashdan 1988). These architectural resolutions, including formal spacing, allowed people to stay in the community and effectively deal with stress.

For research dealing specifically with crowding, stress and architecture the work of social psychologists is the most rewarding. In a recent paper Evans, Lepore and Schroeder (1996) discussed the effects of architectural design ameliorating the negative impacts of crowding. When people are crowded into a structure, there is psychological stress and antisocial instead of prosocial behavior occurs. Individuals, rather than interacting, withdraw from social activities. This avoidance results in social interactions which are not resolved, and avoidance of stress leads to erosion of the social systems. Socially negative behavior disrupts the social support systems in the structure. For many people to live in a single structure, it is essential that cooperative social systems exist.

The basic assumption that crowding leads to stress and social disorder is accepted by social psychologists. How can this stress be reduced and how can co-operative social mechanisms be maintained? Research has been done on architectural solutions to reduce the tension of crowding in dormitories and prisons. It has been found that it is not necessary to increase the amount of square footage of space per individual to produce less stress. Rather, the development of private space, such as enclosed sleeping areas has been found to decrease tension in prisons. This also has the added advantage of preventing the spread of disease. In the case of dormitories, social regulation was achieved by requiring passage through an increased number of spatial zones to reach the units of the students. In the dormitory, the more zones which buffered access to the private space, the greater the social regulation. Individuals did not withdraw from social interaction, but were able to partake in positive social interaction. On the other hand, where there were no spatial buffers, students often withdrew from social interaction, and this resulted in tension and antisocial behaviour.

The deduction of these social psychologists is that architectural solutions can prevent antisocial behaviour and can lead to a reduction in the stress related to crowding. They state:

In addition to room brightness, subunit size, degree of private enclosure, and structural depth, several other interior design elements may influence human response to crowding. Sound attention, visual access and exposure, window views, and proximity to open spaces are some potential interior design elements warranting further exploration [Evans, Lepore and Schroeder 1996:45].

As Sommer states "Crowding gives rise to the need for social regulations that limit the unwanted intimacy which would be likely to arise in the absence of physical barriers (1969:41)." Further:

Spatial segregation is a pervasive principle of social organization... it protects the superordinate against overly intimate exposure to subordinates, maintains physical barriers to socially proscribed sexual arousal and intimacy, and protects the in-group against undue external influences. Under crowded conditions, social norms for maintaining privacy partially substitute for the lack of physical devices [Sommer 1969:41].

The conclusions of social psychologists who deal with the built environment are clear: the problems of crowding can be resolved through architectural intervention, and physical and spatial segregation (through architectural remedies) alleviates and controls social stress. Furthermore, spatial segregation becomes an integral part of existence inside a crowded and complex structure. Obviously in our society, architects can be hired to design spaces with these concepts in mind. For the archaeological past we are faced with attempting to theorize why a specific architectural style
developed and was successful (or not), all with the lack of architectural specialists. This lack of architects makes the hypothesis of a unit of measurement that much more important. For although we cannot argue that there were architects, we can argue that there was control in a measured way, of the construction and the use of the buildings. They were not built nor used randomly, and spatial considerations were acutely understood by the occupants of the longhouse.

Discussion

What are the ramifications of this research for the longhouse? The early multiple family dwellings of the Iroquoians were small enough to accommodate the extended families which inhabited them. In these structures, familial social relations were sufficient to regulate interactions. If there was stress through crowding, then the members of the group fissioned and joined other groups or left for seasonal subsistence activities. If there was stress through crowding, then the members of the group fissioned and joined other groups or left for seasonal subsistence activities. However, as longhouses expanded in length and the number of occupants increased, there came a time when crowding, and the stress generated by crowding was a serious problem. Although people could always leave the community, it is likely that social ties kept people in the village. At that time, architectural solutions, which had earlier appeared in irregular and random manner in the small longhouses, became regularized and non-random in the larger houses. Social and political mechanisms to control stress were accompanied by architectural features in the longhouses which also ameliorated human interaction and alleviated stress. These included well-defined living apartments with partition walls which provided privacy, and apartments of specific sizes in relation to the social status of the occupants.

Conclusions

The shift has been made here from the archaeological-architectural data, where the formalization of longhouses can be quantified, to social psychological research postulating an interpretation for the events observed in the archaeological record. This is definitely an alternative interpretation. Most would opt for the increased economic stability and established socio-political systems argument leading to the development of formal architectural features. But these theories are not exclusive. By looking inside the longhouse and attempting to understand what it would have been like, in human terms, to exist in these huge buildings, one realizes that there are ramifications for human stress levels. Attempting to comprehend the human response to stress adds a different, but complementary, dimension to hypotheses concerning the development of Iroquoian longhouses and Iroquoian society.

Not only must anthropologists look at the details of settlement patterns, they must also consider the social ramifications of the changing use of space for the people inside these houses. Although this line of research is highly theoretical and doubtless controversial, it is stimulating, and is an essential step which archaeologists should take after the shovels and the trowels have been laid down.

Note: A version of this paper was presented at the 1996 NYSAA meetings in Sparrowbush, New York.
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Additional Artifacts Found at the Solecki Site on Manor Hill, Cutchogue, Long Island

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Figure 1. Map of Long Island showing the location of the Solecki Site.
Adding to the record of William A. Ritchie's Orient burial findings on the Solecki Site on Manor Hill in Cutchogue, Long Island, two more pieces of evidence are submitted. The first is a near perfect chipped stone blade manufactured in the Orient culture style. The other is a broken slate gorget with a single perforation.

During the early part of the 1930s, my mother chanced to pick up a point at a spot where some earth was turned up in the excavation for a well. The site of the well excavation is about 100 yd southeast down the slope from the hillock where the Orient burial site was found in 1961 by Ritchie (Figure 1). That summer was away abroad in Alaska. A cursory surface examination of the area, which was grassed over, outwardly showed no signs of aboriginal Indian occupation.

The blade or "point" (Figure 2) is similar in shape to the one illustrated by Ritchie (1980 Plate 57, Figure 21). The pointed biface blade appears to have been made of a dark grey-green Coxsackie chert from the Hudson Valley. It is 5 7/8 in long, 1 9/16 in wide at the greatest width, and 7/16 in thick at the maximum point. It appears to be percussion flaked and nicely trimmed all along its circumference with pressure retouch. In cross section it is biconvex or almond shaped. It has a broad flat stem with opposed deep and wide side notches and a slightly incurvate base. One of the "ears" is slightly broken; otherwise the specimen is whole. The edges are fairly sharp, and not blunted. The raw material for the manufacture of this artifact must have been imported as were other Orient phase materials from the mainland across the Long Island Sound. It is improbable that a chert nodule of this size was collected from native Long Island gravels.

According to my field notes for October 15,1933, I had found the broken gorget (Figure 3) at the well where my mother had found the point described above. Relying on my notes and drawing because the actual specimen (my catalogue No. 331) is presently, not available, it is 3 in long and 1 3/4 in wide at the widest point. It is made of black slate, well-polished on both faces, with a single perforation about 3/8 in in diameter, and bored from one side apparently with a stone point. The thickness of the specimen was not determined.

Figure 2. Chipped stone blade from the Solecki Site. Drawing by Mara Horowitz.
Figure 3 Slate pendant from the Solecki Site found by Ralph Solecki in 1934 (from a page in his 1933 notebook).

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The Cony Knife, An Additional Diagnostic of the Abbott Complex of Coastal New York

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In an effort to determine the temporal position and areal distribution of the distinctive, stemmed and lanceolate argillite bifaces formerly referred to as Steubenville (Mayer-Oakes 1955:90), the coastal New York collection of the Museum of the American Indian, Heye Foundation was surveyed. The regional collection, although lacking precise geographical provenience and contextual data, produced (334) Steubenville-like "Cony" knives (Kaeser 1968:8-26) and (50) isosceles trianguloid knives from the coastal New York area; these were made predominantly of exotic, Delaware Valley argillite. Recent archaeological investigations carried out in the Bronx and Queens County, New York associate the knife form with coastal New York's Middle Woodland period, Abbott Complex.

A projectile point typological and lithic material study was made by Edward S. Rutsch utilizing 8,227 specimens drawn from the coastal New York collection of the Museum of the American Indian, Heye Foundation (Rutsch 1970:112). These materials represent over one-half century of museum acquisitions gathered from professionally directed excavations, and as gifts and purchases from collectors. Lamentably, the collection, derived from eight counties of coastal New York, included only general geographical and contextual provenience data.

Rutsch's analysis revealed the areal distribution of (22) projectile point types reported by county, their frequency, and the sources of (9) locally obtainable and exotic lithic materials. His separation of the point types into broad pre-Woodland and Woodland period groups showed that the greatest use of non-local lithic materials in all county collections occurred during the Late Woodland period.

It was in the course of Rutsch's work that I had the opportunity to identify (241) Cony Lanceolate and (93) Cony Stemmed projectile points from the 8,227 point specimens in the collection from coastal New York. Most significant was their distribution. Points were recovered from the eastern-most end of Long Island at Montauk Point, through Suffolk and Nassau Counties of Long Island, west and south through Kings, Queens, and Richmond Counties and northward through the Bronx and Westchester Counties.

Morphologically distinct from other coastal New York point types, the Cony points are equally set apart by the predominant use of purple argillite in their manufacture. Most striking is their large size. The stemmed and lanceolate varieties range in length from 1 1/2 in to 4 3/8 in. Lanceolates consistently measured the longest, which raised the question of their use as either bow-propelled arrow points, atlatl darts, or stabbing spear points. Because of the points' generally large size, it seems questionable whether they were used as
arrow points. Although the bow and arrow is thought to be 2,000 years old in the Northeast, it is quite possible that some Late Archaic period groups using the atlatl had not changed strategies abruptly and only gradually adopted the bow in the Woodland era. Analogous evidence of trait continuity is inferred in the use of steatite as a tempering material in early ceramic vessels after the phasing out of steatite bowls. Another carryover trait might be the flattened bottoms seen on upper Delaware Valley Marcey Creek Plain vessels (Manson 1948:223-27). The archaeological absence of atlatl weights on Middle Woodland period coastal New York sites strongly infers a general use of the bow. It is a near certainty, however, that many of the larger, seemingly cumbersome, point types manufactured throughout the Archaic and Woodland periods were utilized as knives.

Also discovered in file museum's coastal New York collection was a third type of blade, an isosceles triangular form numbering (50) specimens and averaging 3 1/2 in long and 1 1/2 in wide at the base (Figure 1). Some of the blades reached 5 1/4 in in maximum length and 1 5/8 in in basal width. It became obvious that the isosceles triangular blades shared a number of common morphological elements. Whereas, the typical Cony Lanceolate point expands from the tip to near center of the blade, then tapers to the base to facilitate hafting, the isosceles blade generally shows intentional asymmetric treatment in its shape. One thinned blade edge expands laterally from the tip to the base forming a curved cutting edge. The opposite blade edge, thicker in cross section, is flaked nearly straight from tip to base. The implement base appears unfinished and blunt.

A fraction of the blades examined were made of non-argillaceous material, either jasper, chert, quartz, or shale. These were percussion flaked to shape, then the cutting edges and base were thinned by pressure flaking. The remainder were made of argillite and appear to be percussion flaked completely, showing broad bifacial scars with little, if any, pressure flaking on blade edges. A near obliteration of the flake scars noted on weathered argillite specimens resembles the action of tumbling or water wear. This phenomenon was noted by William A. Ritchie in a collection of stemmed and lanceolate bifaces of weathered argillite recovered in the 1940s from New Jersey to northern New York State (Ritchie 1944: Plate 163; 313). The most numerous argillite blades are of purple color, which when accidentally chipped, shows a continuous purple color below the surface. Gray-colored specimens might contain a black core when broken. The stone can surface weather a gray-green, bluish-gray, or jet-black. All the color variants contain white mineral inclusions resembling the plate-like shell fragments used as a tempering agent in some ceramics.

More recent archaeological research at Middle Woodland period sites in western coastal New York produced considerable numbers of Cony Lanceolate and Cony Stemmed points in context with specimens of the knife form discussed in this paper. Also noted in the site artifact inventories are argillite-hafted scrapers and drills made from salvaged broken Cony points. The value placed by their makers on the exotic mineral and the minimal chipping necessary in such alterations can account for the near complete absence of the gritty, argillite waste flake recoveries on component sites.

At present, it is unknown how long Cony points and the associated knife form were in use during coastal New York's Middle Woodland period. Their broad areal distribution infers a lengthy time period of occupation. In the absence of radiocarbon dates that might temporally delimit the bifaces' use in the region studied here, an unverified estimate of their entry among the indigenous Windsor people (Smith 1950:149) range from the mid-Middle Woodland period to the period's termination exemplified by the East River (Smith 1950:152) material culture introduction into coastal New York. If this supposition is correct, the question arises, why were locally available raw lithic materials not favored for the production of these tools? Of a total (334) Cony points, (128) were made of stone other than argillite. A similar high frequency of argillite use in the manufacture of the knife forms is illustrated in Table 1.

Morphologically, the blades cannot be considered as preforms since they do not duplicate in rough outline the stemmed or lanceolate Cony point. Shaped by percussion flaking, they show a uniformity of manufacture technique similar to the Cony points. The blades appear to be finished, hand-held, cutting implements. Apparently, Cony points and knives, although not exceptionally well-made, were prolifically reproduced near the source of argillite and the finished implements carried into the coastal New York region.

Archaeological evidence gives the impression of coastwise distribution of Abbott lithic and ceramic material traits from a center in the general area of the mid-Delaware Valley. Reinforcing this hypothesis is the physichochemical analysis of an argillite sample recovered from Queens County, New York (Venuto 1967). Just as archaeological evidence has demonstrated the cultural influence and actual arrival of the Mohawk into eastern New York State, and the subsequent spread of Iroquoian ceramic traits into coastal New York, a similar transmission and admixture of material culture traits during the Middle Woodland period, Windsor culture, is suggested archaeologically. It is inferred from the coeval presence in the coastal area of numerous Cony projectile points in context and the distinctive isosceles triangle knives, both made of the same exotic argillite, and an Abbott zoned, decorated and net-impressed ceramic vessel tradition, all of which can be traced to the south.

Thus, along with the Cony point and Abbott zoned decorated ceramic assemblage, the isosceles triangle, Cony
knife can now be considered a diagnostic trait of the Abbott Complex of coastal New York (Kaeser 1968:8-26; 1972:11-15). Lest it be suspected that the postulated direction of movement of the artifact complex from south to north is mere conjecture, it can be adduced as proof of the assumption, that the argillite used in the manufacture of the majority of these points and knives is native to the Delaware Valley of New Jersey.

Table 1. Cony Knife Blade Distribution by Material and County.

<table>
<thead>
<tr>
<th>County</th>
<th>B</th>
<th>Q</th>
<th>NY</th>
<th>K</th>
<th>N</th>
<th>R</th>
<th>S</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arg.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>9</td>
<td>14</td>
<td>32</td>
</tr>
<tr>
<td>Quartz</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Jasper</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Chert</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slate</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>13</td>
<td>23</td>
<td>50</td>
</tr>
</tbody>
</table>

*County Key*

B: Bronx
Q: Queens
NY: New York
K: Kings
N: Nassau
R: Richmond
S: Suffolk.
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