6-19-2011

The Development of Aboriginal Watercraft in the Great Lakes Region

Kimberly E. Monk
The University of Western Ontario

Follow this and additional works at: http://ir.lib.uwo.ca/totem
Part of the Archaeological Anthropology Commons, and the Social and Cultural Anthropology Commons

Recommended Citation
Available at: http://ir.lib.uwo.ca/totem/vol7/iss1/9

This Article is brought to you for free and open access by Scholarship@Western. It has been accepted for inclusion in Totem: The University of Western Ontario Journal of Anthropology by an authorized administrator of Scholarship@Western. For more information, please contact kmarsha1@uwo.ca.
The Development of Aboriginal Watercraft in the Great Lakes Region

Keywords
watercraft, Great Lakes, skin boats, canoes, First Nations

Creative Commons License
This work is licensed under a Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License.

This article is available in Totem: The University of Western Ontario Journal of Anthropology: http://ir.lib.uwo.ca/totem/vol7/iss1/9
The Development of Early Aboriginal Watercraft In the Great Lakes Region
Kimberly E. Monk

In the thousands of years before Samuel de Champlain explored the Great Lakes basin there was scarcely a populated place where the land met river, lake or bay that prehistoric people did not use some form of watercraft. Today, there is a wealth of information about these indigenous vessels from two primary sources: ethnographic accounts and archaeological remains. The Period of Contact provides us with European explorers' letters, books, journals, sketches and paintings of indigenous watercraft. We must also depend on archaeology for additional knowledge about the very earliest watercraft. In some geographical areas the use of watercraft can be inferred simply because islands were settled and material remains were found (McGhee 1984: 7). In others, representations of vessels have been discovered in the form of pictographs, petroglyphs, engravings, murals, models and even surviving aboriginal boats.

Through the analysis of both historical and archaeological evidence, I wish to study the three primary watercrafts of the Great Lakes region: the skin boat, dugout canoe and bark canoe. This discussion will include information on the regional styles of bark canoes among the Eastern Cree, Algonquin and Colonial fur-traders. It will also discuss the materials and methods of canoe construction, the decorative styles of these various canoes, and the variety of utilitarian purposes to which the canoe was employed. Ultimately, the focus of this paper is to analyze the development of Great Lakes watercraft in an effort to emphasize the importance of this line of study to a comprehensive and complete picture of Ontario archaeology and prehistory.

Early Great Lakes Watercraft

In the Great Lakes region, skin boats, dugout canoes and birch bark canoes were used for centuries by the indigenous people. The environment dictated the need for watercraft and provided the natural resources for tools and building materials. Environmental niches also played a major role in the development of specialized local watercraft in diverse regions in and around Ontario. Transportation provided by the many types of watercraft would have been essential to the indigenous peoples of the Great Lakes region, not only for fishing and crop gathering, but also for short and long distance trade with other indigenous populations. Such considerations are important in formulating a cohesive understanding of the peoples who have roamed our waterways for over 11,000 years. The earliest constructed watercraft used in the Great Lakes region, aside from reed constructed craft, was the skin boat (Roberts & Shackleton 1983: 145).

The Skin Boat

Indigenous peoples of the Arctic region constructed the highest quality and most exceptional boats of animal skin. However, the Woodland Indians were also familiar with hide covered craft and utilized this mode of transportation to assist in many utilitarian tasks (Roberts & Shackleton 1983: 149). The simplest skin boat used in the Great Lakes region was actually a coracle called a 'bull-boat'. Adapted from the Plains Indians, the name was derived from the use of buffalo hides. Generally, one or two of these hides were stretched over a basket-like framework of willow or other boughs. Usually, the 'bull-boat' was towed by someone in the water or propelled with short-handled paddles or with poles. Moose skin was also used as the covering for rough-and-ready boats among people of the Woodlands region (Roberts & Shackleton 1983: 152).

Ethnographic reports show that various Great Lakes groups used the bull-boat quite extensively. In the seventeenth century, north of Lake Superior, Pierre-Esprit Radisson became involved with a party of Cree who were using a bull boat (Radisson 1885: 123). George Seton gives other evidence of the use of the 'bull-boat' in 1858, whereby he sketched a group of indigenous peoples modifying the skin boat concept. The location of these indigenous peoples was identified only as "Rupertsland", the name given earlier to the old Hudson's Bay Company. Thus, the specific
peoples who were using and modifying a 'bull-boat' are not unequivocally known (Roberts & Shackleton 1983: 150). However, Seton reports that these peoples improvised with other construction materials to cover a frame while traveling. It is reported that sheath sections of oiled cloth were carried along, that could be fitted over canoe frames made from resilient willow branches and shoots.

Roberts and Shackleton (1983: 153) report that the 'bull-boat' was primarily constructed and maintained by women for assistance in the gathering of agricultural crops and natural foodstuffs, but was also used for fishing. Thus, the 'bull-boat' was primarily a type of watercraft used locally as a working transport and was rarely utilized as a long-distance travelling vessel. Through its capacity as a working vessel, it allowed women the ability to carry out the gathering of crops in a much easier and more productive manner (Roberts and Shackelton 1983: 154). In the Lake of Woods area, an unknown artist sketched Ojibwa women carrying these boats to and from the river. This artist also noted that the boats were removed from the water when not in use, in order to help preserve the skin covering (Adney & Chapelle 1964: 219).

The 'bull-boat' was actually quite an awkward vessel to construct and maintain. It was relatively large, and the materials for its construction were often sparse. Furthermore, it required high maintenance to last any significant amount of time. As such, the bull-boat was not a mainstay in the Great Lakes region. While it continued to be employed on a minor scale for fishing and personal transportation needs, as testified to by the ethnographic reports, generally the bull-boat was replaced by the dugout canoe. The 'bull-boat' simply did not provide a secure basis for everyday extensive use by the indigenous peoples of the Great Lakes region.

The Dugout Canoe

The dugout canoe was probably the first type of canoe made by indigenous groups across North America (Johnstone 1980: 48). It was constructed by selecting a tree of suitable size, which was then chopped or burned down at the base. The top of the tree would then be cut off, and the outside roughly shaped, while the inside was carefully burned and removed. Once the canoe was the desired size many holes were drilled through it so as to gauge the thickness of the hull. Once the desired thickness had been reached, the holes were plugged in with wooden pegs (Christensen 1986: 148). The canoe was then filled with hot water to soften the wood and make it more pliable. The sides of the canoe were stretched apart at the top, and held apart by shaped rods called thwarts. Native watercraft manufacturers would also make the boat wider at the center, and therefore much more stable than a round boat. This procedure would force the front and the back of the boat to lift up slightly (Christensen 1986: 152). The height of the bow and stern relative to the center is called rocker. This was important because the more rocker a boat has the greater maneuverability it would allow.

The hull of the dugout canoe was usually constructed so that the bow of the canoe was the bottom of the tree, because the wood from the bottom of the tree is denser than the wood from the top of the tree. Thus, with a single individual sitting towards the back of the canoe, the denser wood in the front would level the canoe out in the water. This process is referred to as trim (Johnstone 1980: 50). After the basic hull was made, special attachments were designed. Often there were decorative bow and stern cones that served to break large waves and keep them from coming into the boat (Johnstone 1980: 52).

Many examples of dug-out canoes have been found in Ohio. A 3,500-year-old dugout was accidentally discovered in 1976 on the Ringler property in Savannah Lake, Ohio (Brose & Greber 1982: 274). This peat-filled bog had earlier yielded two similar canoes. This vessel of white oak, now known as the Ringler Archaic dugout, has been radiocarbon dated to around 1,500 B.C. This attests to the use of such canoes in the Great Lakes region before the first millennium B.C. Archaeologists Brose and Greber point out that the Ringler dugout exhibits construction techniques that involved the use of fire and stone axes (Brose and Greber 1982: 275).

The dugout is the most prolific and well known of all prehistoric boat types. The dugout canoe allows individuals and groups to travel easily across great distances of water and for the movement of large amounts of cargo from place to place with little effort. It was very useful for the travel necessary for getting to far away hunting areas and returning to camp with game. Furthermore, the dugout canoe is the most likely to survive to be included in the archaeological record.
The sturdy and hearty wood of a dugout canoe is the most unyielding construction material, compared to skin and bark, to natural biodecompositional processes (Hornell 1946: 46).

Although the dugout canoe was preferred in the Great Lakes region to the skin-boat, it had disadvantages. Namely, the weight of the boat made it difficult to transport on land and difficult to paddle in the water (Johnstone 1980: 190; Christensen 1986: 145). A lighter boat was a significant improvement in terms of accessibility of disjoined waterways through portages, and in terms of the power required for motion in the water. It was the bark canoe that filled this role.

The Bark Canoe

The most common bark canoe is the birchbark canoe. The distinctive characteristic of bark canoes is that they were built by forcing a framing system into a previously assembled tree-bark cover. The bark would be peeled off the tree using a knife and then placed over a frame. The bark could then be made pliable through the application of heat at which point the frame and the bark were sewn together using split roots. The seams would be sealed together using a mixture of six parts resin (sap from a coniferous tree), one part animal fat and one part charcoal. The fat added plasticity and the charcoal added body to the mixture (Gidmark 1988: 15; Leshikar 1996: 14).

Though paper birch provided the superior and preferred bark for canoes, the bark of elm, hickory, chestnut, cottonwood and spruce were often used. Some of the prehistoric tools used for building bark canoes in this way were stone gouges, adzes, wedges, hammers, knives, scrapers of stone, bone awls, and wooden mauls (Christensen 1986: 150; Leshikar 1996: 18). These specific prehistoric tools are often the most common tools found on archaeological sites, and a plethora of examples exist in the Great Lakes region.

The bark canoe came in a wide variety of sizes, anywhere from about ten to sixty feet in length (Leshikar 1996: 20). It was not uncommon to have eight or more people paddling the boats. These boats could easily be lifted out of the water and transported long distances over land and between waterways. The smaller canoes were generally solo canoes used for trapping and hunting (Leshikar 1996: 21).

Other uses of the bark canoe included food gathering. In the south and west of Lake Superior, during harvest time in early September, women lined their canoes with thin birch bark and paddled them into standing stalks of wild rice, a staple of the Indian diet and an important trade commodity (Roberts & Shackleton 1983: 162). The stalks were bent over the gunwales and the ears of rice were beaten with short paddles so that the grains fell into the bottom of the craft. Industrious Ojibwa women could fill a canoe three times in a day through this method (Roberts & Shackleton 1983:164).

The bark boat was a 'blind alley' in the history of ship construction and it is the least susceptible of all the boats mentioned to further development. The size of the bark boat is limited by the availability of a suitable seamless bark shell and even the skin of the boat cannot withstand severe wave motion and is vulnerable to damage (Leshikar 1996: 23). However, the bark-boat was excellently suited to its natural environment: the inland waterways and lakes. Thus, it was the bark canoe that occupied and continuously held a main practical and ecological niche of the many Great Lakes peoples.

The use of bark canoes in the various regions around the Great Lakes may not have differed, however, regional styles did develop. These styles assist archaeologists in reconstructing prehistoric spatial delineation and relationships, trade partners and routes, and also gives us clues into the ideological overtones of the various indigenous groups who occupied and utilized the vast and rich waterways of the Great Lakes region.

Bark Canoe Construction Among Cree, Algonquin, and Colonial Fur Traders

Eastern Cree

The eastern Cree, who were located in north-eastern Ontario, employed the use of a building frame that resulted in longer gunwales. A common canoe model in this area was the so-called "crooked canoe", in which there was a very marked fore-and-aft rocker to the bottom without a corresponding amount of sheer (Adney & Chapelle 1964: 101). As a result, the canoe was much deeper amidships than near the ends. Another common canoe model had a rather straight bottom fore and aft, with some lift near the ends and a corresponding amount of sheer. Between these
was a hybrid, which had some fore-and-aft rocker in the bottom and a very moderate sheer (Adney & Chapelle 1964: 101).

Although birch bark was quite plentiful in most of the regions where the eastern Cree were located, some northern areas lacked a comparable abundance. This often made it necessary to construct a bark cover using many small pieces. This was not only laborious but made a rough and rather unsightly cover. Hence, some Cree groups substituted spruce bark, which was available in larger sheets (Hornell 1946: 68).

Little is known about the decoration employed by the eastern Cree. The Montagnais birch-bark model canoe has three small circles placed in a triangular position on the bow and a band along the bottom of the side panels (Gidmark 1988: 33). The circles and the bands are painted in red, although this may represent the dark inner rind left after scraping the winter bark cover (Gidmark 1988: 33). However, much is known of the decoration the Cree employed on their paddles. The Cree were the only indigenous population of the three groups I discuss who decorated their paddles (Adney & Chapelle 1964: 120). These paddles had parallel-sided blades with rounded tips. The handle was sometimes constructed with a ball-shaped top grip and other times it was pole-ended. Old Cree paddles were often decorated with red pigment bands; markings in the shape of crosses; squares in a series; and dots on the blades. In addition, the top grip might also have been painted (Adney & Chapelle 1964: 106).

**Algonquin**

The Algonquin, who were located in southeastern Ontario, were heavily influenced by the fur-trade, in which they were long employed as canoe builders. Many of their uniquely formed canoes were later employed by the Colonial fur-traders (Adney & Chapelle 1964: 121). Unlike the Eastern Cree, the Algonquin canoe style was developed on two different profiles.

The first style to be discussed is the high-ended canoe (Adney & Chapelle 1964: 113). The most marked feature in the appearance of this canoe was the profile of the ends: the stem line had a slight angle at the point where it joined the bottom. This would produce an outward bend in a gentle curve, reaching the perpendicular at a point little more than half the height of the end. From there, it tumbled home slightly - which means that it slightly curved outward when viewing the ship from fore of aft (Adney & Chapelle 1964: 113).

The other form of Algonquin canoe had a low sheer with only a slight lift towards the ends (Adney & Chapelle 1964: 113). In this canoe, the stem might have a short, hard curve at the heel and an upper portion that was straight and slightly tumbled; or the full height might be well rounded, with a slight tumblehome near the stem head (Adney & Chapelle 1964: 113).

There is no certainty about the decoration of Algonquin canoes. Some Algonquian elders claim that the old form of canoe was often decorated with figures formed by scraping the winter bark: usually these figures depicted the game that the owner of the canoe hunted (Adney & Chapelle 1964: 122). Such meaningful decoration could be very useful to archaeologists should any examples be found. Five pointed stars, fish, and circular forms are known to be used as well, however it is not known if these decorations represent cultural in situ Algonquin creations, or if they were adopted from different groups. Certainly more study by archaeologists needs to be done in this area (Adney & Chapelle 1964: 122).

**Colonial Fur Traders**

Fur-trade canoes were specifically employed for use in European exploration pursuits. Unfortunately, little has survived concerning the form and construction of the early French colonial fur-trade canoes. Circumstantial evidence leads to the conclusion that the model was perhaps a development and enlargement of the Algonquin form of a high-ended canoe (Adney & Chapelle 1964: 115). For example, one of the Algonquin models, which has high ends resembling those of the large fur-trade canoe, may have been the type from which the fur-trade canoe was developed. The early French came into contact with the Algonquin before they met the Great Lakes Ojibway who were the other builders of the high-ended model (Gidmark 1988: 17).

Adney and Chapelle (1964: 135) suggest that the basic form of the fur-trade canoe likely stayed the same in the hundreds of years they were utilized in the Great Lakes area. However, they also suggest that it is reasonable to expect differences to occur in accordance with the different trading posts built all over the Great Lakes region. As such, local modifications would

http://ir.lib.uwo.ca/totem/vol7/iss1/9
be patterned on canoes from the specific post location.

All fur-trade canoes are believed to have had narrow bottoms, flaring topsides, and sharp ends (Christensen 1986: 153). The flaring sides were rather straight and the bottoms nearly flat athwartships. The bottom had a moderate rocker very close to the ends. In nearly all of these canoes, the main gunwales were sheered up only slightly at the ends and were secured to the sides of the inner stem-piece. The outwales and caprails, however, were strongly sheered up to the top of the stem (Christensen 1986: 153).

The variation in the forms of fur-canoes was expressed almost entirely in the form and framing of the ends. The curvature and form of the ends varied with the post of building. Generally, the lines were all about the same, though small variations in sheer, rocker, and mid-section must also have existed (Adney & Chapelle 1964: 136). The later fur-trade canoes were actually identified with their post. They had painted on them such names as Duchess, Sir John A. MacDonald, Express, Arrow and Ivanhoe (Adney & Chapelle 1964: 150). In fact, these later canoes were often painted in white, with the figures or letters on this background. The Company flag was often painted on the stem with the initials of the Hudson Bay Company. Many trading posts used such figures as jackfish, loon, deer, wolf or bear on the bow. The rayed circular devices appear to have been long popular and were said to have been introduced by the French.

The discovery and analysis of these vessels clearly holds significant information for archaeologists, in terms of delineating and refining the relationship between indigenous peoples and Europeans. To shed light on the often turbulent relationship between these two peoples and the fur-trade industry will contribute to a line of inquiry which explores a practice that significantly altered the environment and peoples of the Great Lakes region.

Discussion

When pursuing the study of early aboriginal watercraft from a developmental perspective there are five issues that need to be taken into consideration. The first is that watercraft designed for very specific functions, such as fishing, or moving small numbers of people over short distances have been observed to contain only small degrees of detectable change literally over millennia. The second consideration is that some aboriginal watercraft may embody design features merged from more than one core source. It is therefore necessary to look beyond the diversity of appearances with regard to these canoes and instead, concentrate on the basic structure and fundamental shape of the canoe. Change can then be detected in relation to the basic design structure rather than to external appearance. Thus, much study is needed to understand the source and nature of change to the differing prehistoric watercrafts, temporally and spatially. As well, an emphasis should be placed on understanding the technological changes of these watercrafts.

The third issue when studying the history of the development of prehistoric watercraft is that it is not always correct for archaeologists to assume that the design of a successive watercraft is progressive or an improvement on existing models. For example, the dugout has been used for thousands of years and can still be found in some of today's industrial societies, despite numerous alternatives. In fact, archaeologists are finding dugouts in modern cultures that are essentially indistinguishable from those recovered during North American prehistory.

The fourth consideration to archaeologists studying prehistoric watercrafts is that canoes are built of wood and other organic materials such as skins, leather or bark. Wood, however, decays unless it happens to be preserved under exceptional circumstances. Furthermore, it was common to break up canoes once they had reached the end of their working life and then use the materials for something else. For the most part, when studying the development of early aboriginal watercraft, there will be an almost total lack of first hand evidence. In these cases, archaeologists must rely instead on secondary sources. A further problem is that archaeologists may not have knowledge of canoe construction, which may cause difficulties in identifying related artifacts. Therefore what is needed are archaeologists with either a background in nautical archaeology or knowledge of prehistoric shipbuilding.

Thus, the final factor concerns ethnography, which because of the paucity of archaeological examples has an important role to play in the study of the development of the canoe. There are still people today who build boats the way they were built 700 or even a thousand years
ago. Therefore, much opportunity exists for ethnoarchaeological experiments and studies. However, there is a fundamental concern raised here. Watercrafts are by definition mobile; they travel; that is their fundamental design purpose. They carry people and ideas from one region to another. Thus, a serious impediment occurs when trying to fix a certain canoe type to a particular place or people. Issues are raised when claims are made that a particular canoe type is indigenous to a people and/or region. Furthermore, this problem challenges archaeologists and historians to be very specific when using the term indigenous, since it is likely a fluid exchange of technological and stylistic ideas was maintained over vast geographic areas. Although the term indigenous involves connotations of immobility, this correlation simply may not be applicable to studies of transportation.

These problems are familiar to terrestrial archaeologists but they become acute with the specific study of watercraft development. Were canoe designs diffused from technologically advanced regions into less advanced regions? Or did various peoples use similar building materials to solve similar design problems thus arriving independently at similar designs? The question of diffusion or independent development provides a key to the solution of some of the basic problems of watercraft identification because it points clearly to the intention of the canoe builder and the constraints imposed upon them by the materials at their disposal.

Underwater archaeology is a fairly recent development that has opened up many new possibilities towards the study of aboriginal watercraft. Paradoxically, terrestrial archaeologists are more likely to find intact watercraft than their maritime colleagues since wood can survive very well in mud or peat, but deteriorates rapidly in seawater. Thus, maritime archaeologists rarely recover entire watercraft, but what they usually find is the non-perishable cargo, tool kits and possibly fragments of timber trapped underneath the cargo. Such evidence has been found on Allumette and Morrison's Island, located on the Ottawa River (Taylor 1980: 9).

Excavations along the Ottawa River have revealed tools probably used in dugout canoe making (Taylor 1980: 10). On Morrison's Island, archaeologists have discovered copper awls that were used 5000 years ago (Taylor 1980: 12). Awls are essential to the construction of the canoe, but they had many other uses and their mere discovery do not necessarily indicate canoe manufacture. In the period between the use of copper awls 5000 years ago and of iron and steel awls by First Nation peoples today, awls were made of antler, and or, bone (Taylor 1980: 15). Additional artifacts recovered at Morrison's Island are beaver teeth. It is thought that the antecedent to the Indian steel crooked knife, which was believed to be an important tool in canoe construction, was a knife made from the incisor tooth of a beaver. The beaver teeth from Morrison's Island were found ground at the ends to form left or right-handed knives (Taylor 1980: 17). In addition, the site yielded stone gouges and adzes that were indispensable to the manufacture of dugout canoes. Furthermore, on Allumette Island, not far from Morrison's Island, Taylor (1980: 15) described finding "semi-lunar knives of slate"; strongly suggestive of Indian crooked knives. However, as of yet, no knives made of copper and resembling crooked knives have been found in this specific area (Taylor 1980: 20).

The study of the development of aboriginal watercraft is important to archaeology because it gives a more realistic insight into the daily lives of prehistoric peoples. The study of settlement and subsistence could particularly benefit from additional knowledge of watercrafts. An analogy can be made here with past and current studies that employ the medium of pottery to trace and follow the moving settlement of different indigenous groups. Indeed, differing canoe construction methods and materials could assist in delineating the movements, contacts and geographic range of different groups around the Great Lakes region. We have already seen how the existence of regional canoe markings from the various colonial trading posts around the Great Lakes could be used to uncover early trading routes and relations. It is interesting to note that there exists no official records that indicate that these regional markings should have been imprinted on the canoe. Yet, the use of the emblems was widespread: Norway house used a deers' head with antlers, Saskatchewan two buffalo, Cumberland a bear, Red River a grasshopper, and Manitoba a crocus (Adney & Chapelle 1964: 150-151). An additional step could be taken in such material cultural studies, to investigate the feasibility of garnishing a greater understanding of the stylistic and ideological elements of different societies by treating the stylistic components of these early watercrafts,
much the same as decoration on a pottery vessel has been analyzed.

Conclusion

When Europeans first explored the New World, they encountered indigenous peoples who used watercraft extensively for numerous purposes. Throughout the Great Lakes region, in both lake and riverine environments, vessels were made from locally available materials and ranged from those intended for use for a short amount of time, to those capable of making extended voyages. Currently there exists much evidence for the many kinds of prehistoric watercraft that were employed throughout the New World. From models to actual recovered craft, this evidence is greatly enhanced by ethnohistorical and ethnographic data. Furthermore, when sunken craft are located there is a great potential for excellent preservation.

What is important but obscure in the historical record is the interaction between the skin boat, bark boat and the dugout canoe. All of these three watercraft existed simultaneously in specific historical times and places, but have not been analyzed for correlation. The future study of Great Lakes indigenous watercraft needs to focus on the relationship between the terrestrial and aquatic world. Only when considering these two areas in conjunction with one other will we achieve a more enhanced understanding of the remarkable developmental advancements that took place in indigenous Great Lakes watercraft. Overall, the study of prehistoric watercraft will assist archaeologists in understanding the complexity and resourcefulness which was daily employed by the many differing groups of Great Lakes region, to negotiate with one of the most diverse environmental areas in the world.

Glossary

**Aft** toward the stern of a vessel

**Amidships** middle portion of a boat lengthwise or crossways

**Athwartships** from one side of the vessel to the other

**Caprail** timber on top of the side planking of a vessel

**Fore** in the forward part of the vessel

**Gunwale** the upper edge of a boat's side

**Outwale** the planking on the outer portion of a vessel

**Tumblehome** the sloping-in of a vessel's topsides above the point of greatest width

REFERENCES


