

Stone-Tipped versus Bone- and Antler-tipped Arrows and the Movement of the St. Lawrence Iroquoians from Their Homeland¹

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One of the most striking differences between St. Lawrence Iroquoian assemblages and those of the ancestral Haudenosaunee is the scarcity of stone arrow points in the former and their abundance in the latter. Most St. Lawrence Iroquoian populations lacked direct access to sources of quality chert and therefore used bone- or antler-tipped arrows. We argue that stone arrow points have superior killing power and gave the ancestral Haudenosaunee an advantage over enemies who used organic points.

Introduction

In the fifteenth and early sixteenth centuries, St. Lawrence Iroquoian sites were located within the St. Lawrence valley and along its tributaries, from northern New York State to the lower St. Lawrence River near present-day Quebec City (see Figure 1). The general lack of European trade goods on these sites suggests that they were abandoned by A.D. 1580 (Pendergast 1985:34-35). Evidence suggests that some St. Lawrence Iroquoians joined either the Wendat or Haudenosaunee (Iroquois) confederacies or surrounding Algonquian groups. Why the St. Lawrence Iroquoians left remains a topic of debate. Climatic deterioration, the introduction of European infectious diseases, and warfare have all been suggested as explanations. This paper examines the possible role of warfare, suggesting that St. Lawrence Iroquoians and ancestral Haudenosaunee fought within shared buffer zones. We suggest that the projectile technology of the St. Lawrence Iroquoians and their apparent lack of a confederacy would have placed them at a disadvantage during any conflict with the ancestral Haudenosaunee.

Differences between St. Lawrence Iroquoian and Iroquois Projectile Point Assemblages

Most St. Lawrence Iroquoian sites contain relatively few arrow points, and the majority are made of bone or antler rather than stone (Jamieson 1990:392-393, 2016; see Figure 2 for examples). The use of bone and antler for projectile points and other tools is considered a cultural attribute of St. Lawrence Iroquoians. A total of 263 projectile points from 19 St. Lawrence Iroquoian sites indicate an average of 13.8 projectile points per site, with 84 percent of those points being bone or antler. This average includes 132 bone points from the Roebuck site. If Roebuck is excluded from the sample, the average is 4.3 bone or antler points per site. These data contrast with a sample of 19 fifteenth- and sixteenth-century eastern ancestral Onondaga, Oneida, and Mohawk sites, containing on average 130.1 stone points per site. A total of only 20 bone or antler points were recovered from these 19 sites (Table 1).

The triangular Madison arrow point used by the ancestral Haudenosaunee likely detached from the arrow shaft once it had entered a target. This

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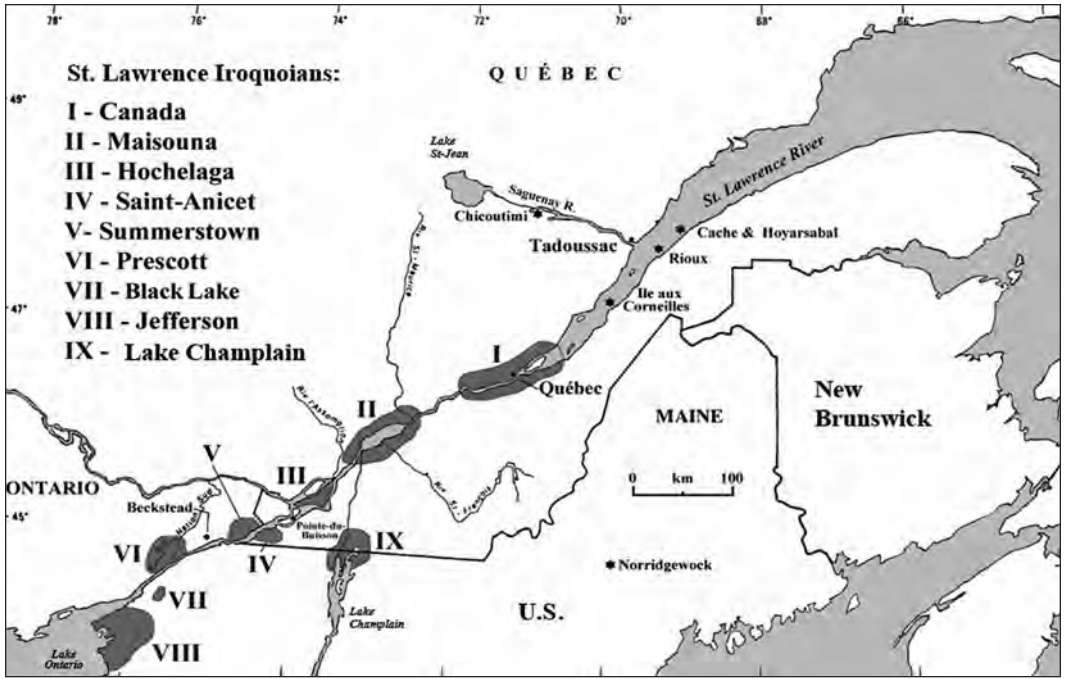


Figure 1. St. Lawrence Iroquoian site clusters.



Figure 2. Bone and antler projectile points (Canadian Museum of History). Top Row: Roebuck 11430 (antler), 11234, 10815, 11748, 11374; Draper 11309. Bottom Row: McKeown 060191; Draper 36499, 40106; Roebuck 12197, 11942, 11960; McKeown 090221; Draper 31723, 66229, 14778. The four bone projectile points on the left of the bottom row were likely attached to spears.

Table 1. *Chert and osseous projectile points from fifteenth and sixteenth-century Iroquoian village sites.*

Site	Date (A.D.)	Location Affiliation	Osseous n	Proportion*	Chert n	Proportion*	Reference(s)
Masson	1450–1520	Canada SLI	1		1		Benmouyal 1990
Mandeville	1450–1550	Maisouna SLI	2		2		Chapdelaine 1989
Lanoraie	ca. 1350?	Maisouna SLI	0		0		Clermont et al. 1983
Dawson	ca. 1500	Hochelaga SLI	4	66%	2	34%	Pendergast 1972
Droulers	1475–1500	Saint-Anicet SLI	0		3		Chapdelaine 2013
Mailhot-Curran	1520–1530	Saint-Anicet SLI	1		3		Chapdelaine 2015a,b; Gates St-Pierre & Boisvert 2015
Gray's Creek	1400–1450	Summerstown SLI	3		0		Pendergast 1966
Salem	ca. 1450	Summerstown SLI	16	94%	1	6%	Pendergast 1966
Summerstown	1600s	Summerstown SLI	2		3		Gates St-Pierre 2014; Pendergast 1968
Glenbrook	ca. 1550	Summerstown SLI	1		2		Pendergast 1981
Roebuck	1450–1500	Prescott SLI	132	94%	8	6%	Jamieson 2016
McKeown	ca. 1500	Prescott SLI	27	87%	4	13%	Jamieson 2016
McIvor	1450–1550	Prescott SLI	3		1		Chapdelaine 1989
Pine Hill	1400–1450	Black Lake SLI	2		0		Vavrasek 2010
Putnam	early 1600s	Jefferson SLI	17	74%	6	26%	Skinner 1921
Durham	early 1600s	Jefferson SLI	0		5		Sidler 1971
St. Lawrence	ca. 1525	Jefferson SLI	9	100%	0		Abel 2001
Fort Drum	1450–1500	Jefferson SLI	0		1		Rush pers. comm.
Bohannon	1500–1620	Lake Champlain SLI	0		1		Robinson pers. comm.; Petersen et al. 2004
Copeland	ca. 1500	Ancestral Wendat	75	53%	66	47%	Channen and Clark 1965; Fox pers. comm.
Draper	1470–1510	Ancestral Wendat	73	35%	136	65%	Jamieson 2016; Poulton 1985
Keffer	1490–1550	Ancestral Wendat	35	24%	111	76%	Jamieson 2016
Parsons	ca. 1450	Ancestral Wendat	1	9%	10	91%	MacDonald 1998; Thomas 1998
Arbor Ridge	1425–1450	Ancestral Wendat	8	100%	0		Adams 2003
Kirche	1500–1550	Trent Valley Wendat	1		1		Ramsden pers. comm.
Benson	1500–1550	Trent Valley Wendat	1		3		Ramsden pers. comm.
Payne	1450–1500	Trent Valley Wendat	3	50%	3	50%	Pendergast 1964; Williamson 2014
Pipeline	ca. 1470	Neutral	13	48%	14	52%	Finlayson 1998
Retreat	ca. 1470	Neutral	1	7%	14	93%	Finlayson 1998
Acheson	ca. 1480	Neutral	2	3%	57	97%	Finlayson 1998

Site	Date (A.D.)	Location Affiliation	Osseous n	Proportion*	Chert n	Proportion*	Reference(s)
Milton	ca.1510	Neutral	4	29%	10	71%	Finlayson 1998
Campbell	ca.1510	Neutral	10	45%	12	55%	Finlayson 1998
Lawson	1500–1525	Neutral	3	3%	100	97%	Wintemberg1939
Hunter-Beeton	ca. 1525	Neutral	1	9%	10	91%	Finlayson 1998
Ivan-Elliott	ca.1540	Neutral	2	20%	6	80%	Finlayson 1998
Irving-Johnson	ca.1570	Neutral	3	3%	83	97%	Finlayson 1998
Metate	ca.1570	Neutral	0		46	100%	Finlayson 1998
Burke	ca. 1480	Onondaga	0		25	100%	Tuck 1971
Barnes	1500–1525	Onondaga	0		71	100%	Bradley 1979
Temperance	1525–1550	Onondaga	0		37	100%	Bradley 1979
Atwell	1525–1550	Onondaga	0		26	100%	Bradley 1979; Just pers. comm.
Chase	1575–1600	Onondaga	1	10%	9	90%	Bradley 1979
Nichols Pond	ca. 1450	Oneida	1	3%	32	97%	Pratt 1976
Buyea	ca.1460	Oneida	1	5%	19	95%	Pratt 1976
Olcott	ca.1480	Oneida	0		15	100%	Pratt 1976
Vaillancourt	1500–1550	Oneida	0		33	100%	Pratt 1976
Diable	ca.1550	Oneida	1	2%	61	98%	Pratt 1976
Goff	1550–1600	Oneida	0		32	100%	Pratt 1976
Bach	1570–1590	Oneida	1	2%	47	98%	Pratt 1976
Beecher	1590–1610	Oneida	5	10%	43	90%	Pratt 1976
Cameron	1590–1610	Oneida	9	1%	1402	99%	Pratt 1976
Otstungo	1450–1525	Mohawk	1	1%	192	99%	Snow 1995
Elwood	1450–1500	Mohawk	0		94	100%	Snow 1995
Klock	1540–1575	Mohawk	0		165	100%	Funk and Kuhn 2003
Garoga	1550–1600	Mohawk	0		105	100%	Snow 1995
Smith-Pagerie	1560–1580	Mohawk	0		90	100%	Funk and Kuhn 2003

* Insofar as possible, numbers are for Iroquoian artifacts. If a site yielded five or fewer points, the relative percentage of stone versus osseous points is not given.

usage resulted in most whole stone points and point fragments being brought back to the village embedded in meat or bone and then being discarded. The presence of points and point fragments in refuse areas and inside longhouses at the Eaton site (ca. A.D. 1550) in western New York supports this explanation of their abundance on sites (Engelbrecht 2014:11). The relative scarcity of projectile points on St. Lawrence Iroquoian sites argues for different arrow point life histories.

The Role of Buffer Zones

While faunal analyses indicate that fish were important in the diet of Iroquoians, deer hides for clothing were a critical resource (Birch and Williamson 2013:113-117; Gramly 1977). The habitat for deer was less favourable in most of the St. Lawrence Iroquoian territory than in other areas of Iroquoia (Stewart 1999:158-159). Buffer zones between hostile groups are less frequently hunted, allowing deer populations there to reach higher numbers than if they were active hunting territories (Hickerson 1965). St. Lawrence Iroquoians may have been forced into such zones to meet their needs for deer hides. The formation of the Haudenosaunee Confederacy would have opened buffer zones between allied nations, initially increasing the overall carrying capacity of Confederacy territory (Leblanc 2006:446). We hypothesize that, as former buffer zones were regularly hunted, the buffer zone lying between the St. Lawrence Iroquoians and the ancestral Onondaga, Oneida, and Mohawk would have become increasingly attractive to the latter. If St. Lawrence Iroquoian hunters also ventured into this zone, the likelihood of them encountering competing ancestral Haudenosaunee hunters/warriors would have increased.

Onondaga chert is found in ancestral Haudenosaunee territory, some 100 km to the south of the southernmost St. Lawrence Iroquoian occupations, located in Jefferson County, New York (see Figure 3). Onondaga chert arrowheads and even flakes are scarce on fifteenth- and sixteenth-century St. Lawrence Iroquoian sites (Burke 2015; Gates St-Pierre 2010). However, use

of Onondaga chert is common on earlier sites in the St. Lawrence Iroquoian region. Meadowood (ca. 1000–400 B.C.E.) cache blades made of Onondaga chert are found in abundance, as are Jack's Reef (ca. A.D. 400–1000) and Levanna (ca. A.D. 900–1350) points (Gates St-Pierre and Chapdelaine 2013; Taché 2011). This changed pattern of chert usage suggests St. Lawrence Iroquoians did not have access to Onondaga chert. While lesser quality toolstone occurs in St. Lawrence Iroquoian territory, it is difficult to replicate the long, thin points used by the ancestral Haudenosaunee with such materials. St. Lawrence Iroquoian use of bone or antler points is often considered a cultural choice, but we argue that St. Lawrence Iroquoian used such points out of necessity.

Functional Differences between Stone-tipped and Bone- and Antler-tipped Arrows

Antler and bone points do have some advantages over stone points. The material is readily available, and although bone and antler points take longer to make, they are more durable than stone points, which easily shatter (Bergman 1987; Guthrie 1983). They are therefore more effective in penetrating wooden armour (Dye 2009:14). If both St. Lawrence Iroquoians and ancestral Haudenosaunee were wearing armour, the former would have had an advantage with bone- or antler-tipped arrows. However, in a surprise hostile encounter when combatants were not wearing armour, the ancestral Haudenosaunee, with their stone points, would have had the advantage. Detachment and fragmentation of a stone projectile within an enemy may be considered roughly analogous to a modern expanding bullet (Engelbrecht 2015). Such a wound causes hemorrhaging, and fragments are difficult to extract. Left within a wound, stone points and point fragments serve to increase the ultimate lethality of the wound through infection. The lack of durability of thin Madison points thus gives them an advantage in warfare.

Stone points also have the advantage of sharper edges, which cut flesh and cause greater

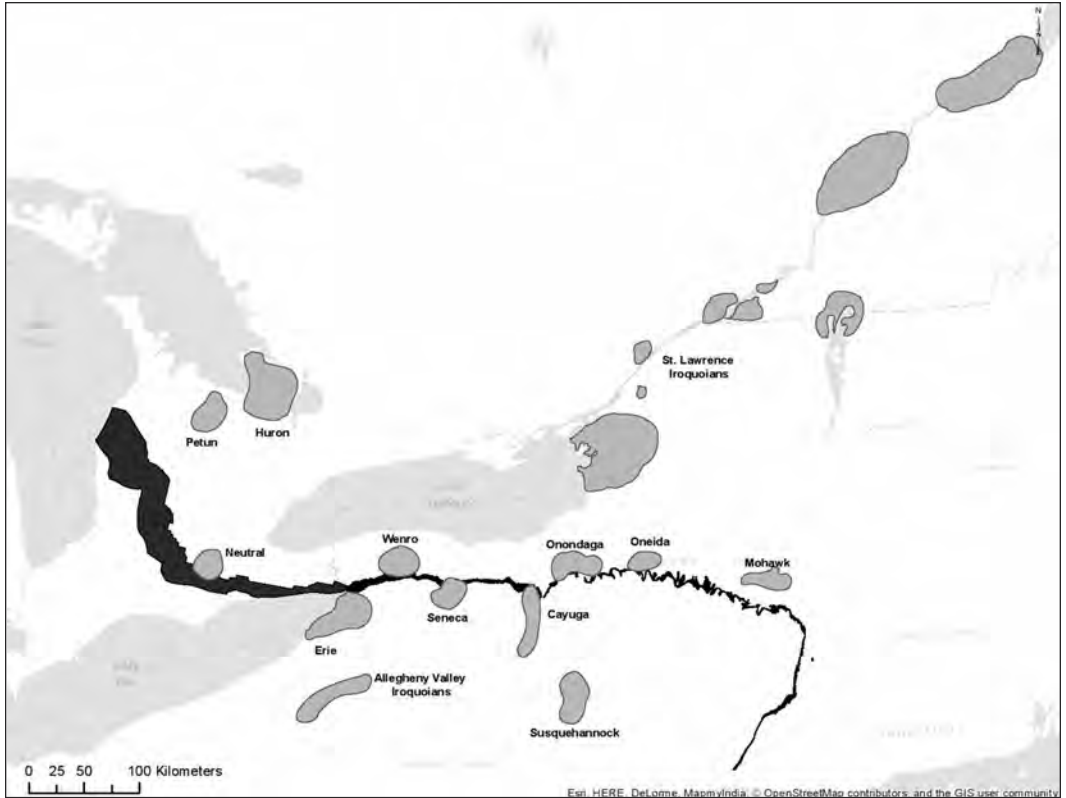


Figure 3. Chert bearing Onondaga Formation and Native Nations in the sixteenth century.

damage (Ellis 1997:51). They do this by creating a larger inner wound cavity (Wilkins et al. 2014). Ellis (1997) notes the preference in most parts of the world for stone projectiles and documents that their preferred use, and hence their superiority, in killing large mammals and humans.

Bone and antler points are typically narrower than stone points, including most Madison points. Jamieson (2016:13-18) defines three basic types of bone and antler points on St. Lawrence Iroquoian sites: simple bone points, conical bone points, and conical antler points. While the conical antler points have an average width of 11.5 mm, the average width of conical bone points and simple bone points is less, at 11.1 mm and 8.3 mm, respectively. For an archer to kill either a deer or a human, the most effective shot would be one that passes through the ribs and enters the thoracic region. Narrower points have an advantage in this regard. As Guthrie (1983:294) demonstrated by

experiment, bone points with diameters less than 10–11 mm penetrate game more effectively than do thicker points. The flexibility and impact resilience of antler allows this type of projectile to graze past ribs and remain intact to fully penetrate the thorax (Pokines 1998:882).

St. Lawrence Iroquoian and Iroquois Relations

While several kinds of weapons were described by early observers, including clubs and spears, seventeenth-century Jesuit accounts of Haudenosaunee attacks on Wendat villages describe arrows falling like rain or hail (Thwaites 1896-1901:16:149, 19:223, 23:175). To date, the general lack of finds of stone arrow points within St. Lawrence Iroquoian sites argues against such arrow volleys as a pattern for ancestral Haudenosaunee–St. Lawrence Iroquoian warfare.

Wonderley (2005) notes that the presence of

pipe types characteristic of St. Lawrence Iroquoians in Jefferson County on eastern ancestral Haudenosaunee sites is suggestive of a diplomatic interaction sphere. Using trace element analysis to determine the region of manufacture, Kuhn (2004:153-158) found three northern Iroquoian pipes on fifteenth-century Mohawk sites, but only one on an early sixteenth-century site. If exotic pipes may be taken as a proxy for diplomatic activity and social interaction, the available data suggest a decline and then absence of such friendly contact between St. Lawrence Iroquoians and the ancestral Mohawk as the sixteenth century progressed.

Tuscarora author David Cusick (1828:14-15) recounted an oral tradition of the formation of a confederacy among northern nations of the St. Lawrence, but according to this tradition, war between these nations then caused their destruction. Cartier's 1535 account notes a rivalry between two groups of St. Lawrence Iroquoians (Stadaconans and Hochelagans). The lack of a strong confederacy between St. Lawrence Iroquoian groups would have placed them at a disadvantage relative to both the Wendat and Haudenosaunee confederacies, which appear to have been consolidating in the sixteenth century.

Trigger (1972:71-93) discusses conflicting historic accounts of the fate of the Hochelagans, including that of Lescarbot, who recorded a tradition that 8,000 Haudenosaunee warriors invaded the St. Lawrence valley, annihilating the people of Hochelaga and surrounding groups. Even if Lescarbot's account exaggerates the number of Haudenosaunee warriors, it reminds us of the potential of the Haudenosaunee Confederacy to field hunting and war parties made up of individuals from multiple nations. The Masson site near Quebec City appears to be intrusive, and it is possible that its inhabitants were refugees from the Hochelaga region (Chapdelaine 2004:70).

Conclusion

We will probably never know all the reasons leading to the dispersal of the St. Lawrence Iroquoians in the sixteenth century. Part of the

answer may lie in the ancestral Haudenosaunee use of stone points, which often proved more lethal in warfare than bone- or antler-tipped arrows. Even if an enemy's death from an embedded stone arrow or fragment thereof was not immediate, the eventual, desired result was the same – the death of an enemy. In a small population, even a slightly higher casualty rate than that of a traditional enemy over the course of a generation or two could force that population to move or merge with another (Keeley 1996:88-94).

The St. Lawrence Iroquoians' greater reliance on bone and antler technology appears related to a lack of access to quality chert. The formation of the Haudenosaunee Confederacy would have eliminated internal buffer zones, but not those between the ancestral Haudenosaunee and the St. Lawrence Iroquoians. With the dispersal of the St. Lawrence Iroquoians, most of their former territory became a giant buffer zone between the Wendat and Haudenosaunee confederacies (Birch 2015).

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L'une des différences les plus marquantes entre les assemblages iroquoiens du Saint-Laurent et ceux des Haudenosaunee ancestraux est la rareté de pointes de flèches de pierre au sein du premier groupe et l'abondance au sein du dernier. La plupart des populations iroquoiennes du Saint-Laurent n'avaient pas d'accès directs à du silex de qualité alors ils utilisaient des flèches à pointes d'os ou de bois d'animal. Il est soutenu que les pointes de flèches de pierre sont plus meurtrières et que celles-ci offraient un avantage aux Haudenosaunee ancestraux sur leurs ennemis qui utilisaient des pointes organiques.

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