GLASS BEADS FROM CHAMPLAIN'S *HABITATION* ON SAINT CROIX ISLAND, MAINE, 1604-1613

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One of the earliest French attempts at settlement in northeastern North America occurred on a small island in the St. Croix River along the Maine/New Brunswick border. Built under the auspices of Pierre Dugua, Sieur de Mons, and his young lieutenant, Samuel de Champlain, this settlement barely survived the winter of 1604-1605 and was abandoned the following summer. Given its clear historical association and brief occupation, the glass beads from St. Croix Island are an important archaeological marker for reconstructing French influence during the first decades of the 17th century. Knowing who used these beads in trade, however, does not indicate where they were made. Current evidence suggests that many, and perhaps most, of these beads were produced at the Carel-Soop glasshouse in Amsterdam (1601-1624) and are a material expression of the culturally diverse partnerships that sponsored many of the early-17th-century voyages to Terra Nova.

INTRODUCTION

The *habitation* on St. Croix Island was established during the summer of 1604 by Pierre Dugua, Sieur de Mons. A Protestant from Saintonge, he had been to Terra Nova before, as a participant in Pierre Chauvin's abortive attempt to establish a settlement at Tadoussac in 1600. In 1603, Henry IV appointed him Sieur de Mons and made him lieutenant general for all of Acadia, a vast section of the Atlantic coast between 46° and 40° north latitude, or from Cape Breton to the northern edge of what the English claimed as Virginia. After failing to find a suitable location for a permanent settlement along the eastern shore of the Bay of Fundy, de Mons explored the western shore, reaching the mouth of a wide and deep river in late June. Joined by two tributaries just upstream, this river was named the St. Croix by de Mons. The actual settlement was built on a small island near the mouth of the river (Figure 1; Plate WIIIA). Initially, the island seemed a good choice. It was easy to defend and had ready access to fish, game, and other resources. St. Croix was a good choice for economic reasons as well. It could serve as a base for finding the region's reputed copper and silver mines, as well as an excellent location to trade for furs, an increasingly lucrative business, with the local Etchemin (Passamaquoddy) people.

With construction begun during the summer, the island seemed a safe place to winter. The reality proved to be quite different. With no fresh water source on the island and the river frequently choked with ice, firewood and food were soon in short supply. By March 1605, nearly half of the 79 men in the garrison had died, many of scurvy. Although provisions and new recruits arrived that spring, a decision was made to find a more suitable location for settlement and by August the buildings had been dismantled and shipped across the Bay to a new site named Port-Royal at the mouth of the Equille River.

Although the French never resettled on St. Croix, the site remained a place of pilgrimage for the French over the next

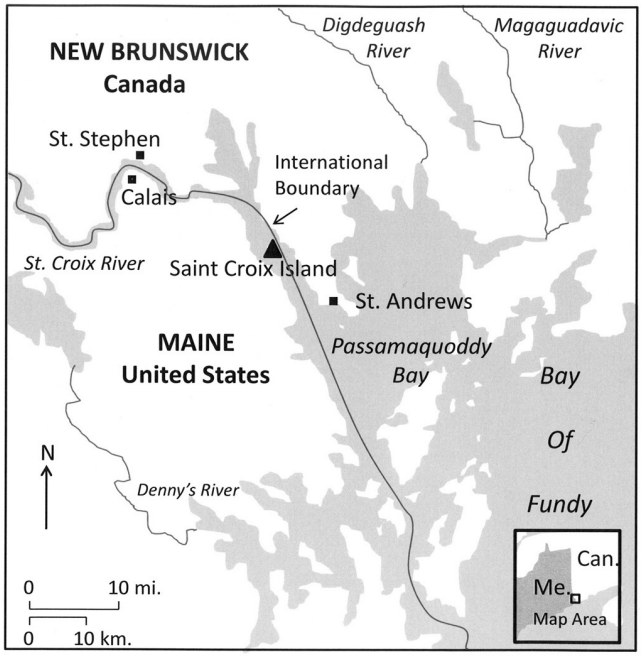

Figure 1. Saint Croix Island and Passamaquoddy Bay (reproduced with permission, Maine Historic Preservation Commission).

decade. Marc Lescarbot visited it in 1607, and in 1610, Jean de Poutrincourt noted that the local Native population had left everything untouched. The English were also frequent visitors, primarily to fish but also to defend their own claims, even though George Popham's 1607-1608 colony at the mouth of the Kennebec River had fared no better than St. Croix. In 1613, the French received a more forceful remainder of English ambitions in the region when Samuel Argall, on behalf of the Virginia Company of London, was ordered to destroy all French settlements and fortifications as far north as Cape Breton. This he did, burning what was left of St. Croix in October and Port-Royal in November (summarized from Thierry 2012).

On the archaeological side, St. Croix also has a complex history. In 1797, excavations were made in order to help determine the location of the United States/Canada border. Nearly 150 years later, Congress authorized that St. Croix Island be declared a National Monument and National Park Service archaeologist J.C. Harrington devised a research plan for the site. A series of excavations took place during the 1950s and 1960s uncovering several foundation walls and the colony's cemetery, but little of this information was publically available until a recent report (Pendery 2012). This article is a modified version of Chapter 10 in that report (Bradley 2012). In terms of the site itself, a memorandum of understanding was signed in 1982 by the United States and Canada agreeing to share information and coordinate preservation efforts. In 1984, the island was designated an International Historic Site, the only one in the National Park system.

THE SAINT CROIX BEADS

Glass beads, whether intended as gifts or as trade merchandise for the local Native people, are an important component of the Saint Croix site assemblage. Although the number and variety of beads has not changed significantly from previous reports, the broader context for interpreting them has. The glass bead assemblage from Saint Croix Island is significant for four reasons. First, it is the artifact group with the widest distribution across northeastern North America. Given the site's brief occupation (1604-1613) and specific cultural associations, the glass beads from the island have served as a benchmark (Glass Bead Period 2) in defining regional site sequences from the Canadian Maritimes to the western Great Lakes. Second, by comparing the Saint Croix Island beads with those from production sites in Europe, it is possible to begin documenting the multi-cultural, if not international, nature of Western European trade consortiums at the turn of the 17th century. Third, as a class of material selected specifically for trade rather than to support settlement, glass beads provide an important measure as to what Native people wanted as consumers, especially in terms of color. Finally, because of the early and precise dates of the Saint Croix occupation, it is possible to demonstrate that its glass bead assemblage predates the development of wampum. In other words, wampum appears to have been developed in response to these beads and did not serve as a model for them (Bradley 2011).

Although glass beads were recovered during the various archaeological excavations on Saint Croix Island, the actual number remains unclear. The current National Park Service (NPS) artifact database for Saint Croix Island lists 47 beads (Table 1). Hadlock's fieldwork in 1950 produced at least "one oval blue bead" (Johnson 1996:36-37) while Gruber reported that 51 beads were found during his excavations in 1970. When I examined the glass beads from Saint Croix stored at the NPS Charlestown Navy Yard curatorial facility in 1983, 51 of the 56 reported beads were present (Plate VIIIB). My amended list of these beads using the taxonomic system developed by Kenneth and Martha Kidd (1970) is presented in Table 2 (in the tables, an asterisk [*] denotes varieties not recorded by the Kidds).

If the actual number of beads is unknown, so is the exact context in which many of them were found. Forty-four of the 47 beads in the NPS database can be identified by archaeological context (Plate IXA). The remaining three beads are unprovenienced.

Feature 1. This roughly oval trash deposit contained mammal bone, shell, and charcoal as well as "plentiful" artifacts including "a number of small glass beads" (Cheek 1969:62). Ten beads are recorded from this feature: Ia5 (2), IIIb* (1), and IIa40 (7).

Feature 2. This shallow deposit of dark brown, possibly burned, soil contained charcoal, glass and ceramic fragments, nails, and one bead (Ia5) (Cheek 1969:61). At least ten other glass beads were found, including Ia5 (4), IIa40 (4), and those described as "green oval beads" (IIa15?) (2). Another cluster of six beads (all Ia5) was found east of those listed above.

"Cobble floor" and "Wall B." These building features are often identified as remnants of the "storehouse." Eight beads appear to be related to this structure. One (Ia5) was recovered from the cobble floor while three others (Ia5 [1], IIa40 [1], and IIa15 [1]) were found in the subsoil. In an adjacent excavation unit, three beads (IIa40 [2] and Ia5 [1]) were found in association with Hadlock's "Wall B" while one Ia5 bead was recovered from the subsoil. The remaining

Table 1. Current National Park Service Inventory of Glass Beads from Saint Croix Island (Distribution by Excavation Unit and Catalog Number).

Kidd Code	IIa40	Ia5	IIa15	IIa57	IIIb*	IVa16?
	162	165, 180	191			
		188				
	164, 176	163, 175				
	155, 156, 157, 158, 159, 160, 161, 168, 170, 172, 174	153, 154, 167, 171, 177, 994	169, 173		152	
		182, 183, 184, 185, 186, 1021				
	179, 189, 190		693			692
	166					
	181					
	187					
	178					
		2328, 2329, 2330				
Totals	**21**	**20**	**4**	**0**	**1**	**1**

Table 2. Total Reported Glass Beads from Saint Croix Island.

Rank	Kidd Code	Shape	Size	Description	Qty.	Comments
1	IIa40	round	S	op. robin's egg blue	1	
	IIa40	round	M	op. robin's egg blue	24	
2	Ia5	tubular	S-M	op. white	24	4 mm ave. diameter; 12-16 mm length; quite regular & even in glass quality; ends are slightly finished
3	IIa15	oval	M	op. white	5	5 mm diameter; reported as "greenish;" not seen (cat. # 169, 173, 191, 693)
	IIa57	oval	M (?)	tsp. (?) bright navy	1	reported, not seen
	IIIb*	tubular	M	tsl. robin's egg blue w/ 3 red stripes; white core	1	ends are unfinished (# 152)
	IVa16?	round	M (?)	op. "blue w/ 2 white stripes"	1	reported, not seen (# 692)
Total					**57**	

13 beads were found in other test or excavation units across the site.

These beads appear to have been associated with the Sieur de Mons occupation of 1604-1605. Given the ongoing French interest in this site until 1613, however, when Captain Samuel Argall destroyed all remaining structures, it seems prudent to date this assemblage to the period 1604-1613.

COMPARABLE FRENCH ASSEMBLAGES

Are the beads from Saint Croix Island consistent with those from other early-17th-century assemblages in northeastern North America? Two sites in Quebec City, Champlain's *habitation* (151QU and CeEt-9)[1] and Fort St. Louis,[2] have produced comparable glass bead assemblages dating from the first decades of the 17th century. Excavations

at Champlain's *habitation* produced a particularly important assemblage: at least 135 glass beads from three well-defined contexts dating between ca. 1600 and 1629.[3]

Champlain's *habitation*, Phase 1: Contact period (1600, 1608-1624). Nadia Charest reports 89 beads from three Phase 1 contexts: 11A26, 14A26, and 16A11 (Bradley 2012:286, Table A6.1). It was not possible to examine the Phase 1 beads, but by reorganizing Charest's counts, they could be placed into rank order (Table 3).

Champlain's *habitation*, Phase 2: Champlain's first occupation (1608-1624). Charest reports 38 beads from five Phase 2 contexts: 11A25, 14A24, 14A25, 15A9, and 16A10 (Bradley 2012:286, Table A6.1). It was possible to examine three samples of beads (n=5) identified as coming from Phase 2 (Table 4). Based on this examination and reorganizing Charest's counts, the beads could be put into rank order (Table 5).

Table 3. Glass Beads from Champlain's *Habitation*, Quebec (Phase 1, 1600-1624).

Rank	Kidd Code	Shape	Size	Description	Qty.
1	Ia5	tubular	S-M	op. white; some have slightly finished ends	33
2	Ia19	tubular	S-M	tsp. bright navy	22
3	IIa15	oval	S-M	op. white	10
4	Ia6	tubular	S	op. light ivory	3
5	Ia8	tubular	S	tsl. citron	3
6	IIa19	circular	S	op. amber	2
	IIa48	round	S	op. dark shadow blue	2
	IIIa1	tubular	M	op. red; black core	2
	IVk3	?	M (?)	op. blue "star" bead; probably IIIk3	2
7	Ic6	tubular	VS-S	tsp. oyster white; 5 sides	1
	IIa1	round	VS-L	op. red; black core	1
	IIa13	round	VS-L	op. white	1
	IIa14	circular	S	op. white	1
	IIa57	oval	S	tsp. bright navy	1
	IIIb9	tubular	L	tsp. bright navy w/ 15 white stripes; white core	1
	IVk4	round	L	op. blue "star" bead	1
Total					**86**

Table 4. Sample of Glass Beads Identified from Champlain's *Habitation*, Quebec (Phase 2, 1608-1624).

Context	Kidd Code	Size	Shape	Description	Qty.	Comments
CeET 9 13A25	1a5	VS	tubular	op. white	1	5 mm long, 5 mm diameter; very thin
	IIa32	S	oval	tsp. turquoise	1	8 mm long, 2 mm diameter
CeEt 9 16A10	IIIk3	S	tubular	op. blue "star" bead	1	faceted ends
	Ia5	S	tubular	op. white	1	5 mm long, 5 mm diameter
CeEt 9 15A9	Ibb*	M	tubular	op. apple green w/ 3 red-on-white stripes	1	12 mm long, 6 mm diameter
Total					**5**	

Table 5. Glass Beads from Champlain's *Habitation*, Quebec (Phase 2, 1608-1624).

Rank	Kidd Code	Shape	Size	Description	Qty.
1	Ia5	tubular	S-M	op. white; some have slightly finished ends	15
2	Ia19	tubular	S-M	tsp. bright navy	4
3	IIa39/40	round	S	tsl. aqua blue (NC – IIa39; JB – IIa40)	3
4	IIa15	oval	S-M	op. white	2
5	Ia15	tubular	L	tsl. bright blue	1
	Ibb*	tubular	L	op. bright mint green w/ 3 white-on-red stripes	1
	IIa11	round	VS	tsl. oyster white	1
	IIa32	oval	S	tsp. turquoise	1
	IIa35	round	M	op. light aqua blue	1
	IIa57	oval	S	tsp. bright navy	1
	IIIbb7	tubular	L	tsp. bright navy w/ 3 red-on-white stripes	1
	IIIk3	tubular	S	op. blue "star" production tube with ground, faceted ends (NC reports this as IVk3)	1
	IVa1	round	M	op. red; black core	1
Total					**33**

Champlain's *habitation*, Phase 3: Champlain's second occupation (1624-1629). Nineteen Phase 3 beads came from three Phase 3 contexts: 11B8, 12A41, and 12A50 (Bradley 2012:286, Table A6.1). Two samples of beads (n=4) identified as coming from Phase 3 were studied (Table 6). Based on this examination and a reorganization of Charest's counts, it was possible to order the beads as shown in Table 7.

Fort St. Louis, pre-1629 context. It was possible to examine 23 glass and 18 discoidal shell beads[4] from this context (Table 8).

It is always tricky to compare artifact distributions across a series of sites, especially when different sampling and excavation strategies have been used. Nonetheless, in comparing the occurrence of bead varieties from Saint Croix with those from Champlain-related sites in Quebec, the similarities are notable (Table 9). Although there is variability, all four of the assemblages from Quebec have more than a 50% overlap with the beads from Saint Croix Island.[5] More specifically, two varieties (Ia5 and IIa57) are present in all five samples while two more (IIa15 and IIa40) occur in four of the five. The similarity of these assemblages may reflect Native preferences, or the possibility that many of these beads were acquired from the same production source.

COMPARABLE ENGLISH-RELATED SITE ASSEMBLAGES

The glass bead assemblages from two English-related settlements of the early 17th century – one on the Gulf of Maine coast, the other in Virginia – provide a useful comparison with the French-related glass beads.

Table 6. Sample of Glass Beads Identified from Champlain's *Habitation*, Quebec (Phase 3, 1624-1629).

Context	Kidd Code	Size	Shape	Description	Qty.
CeET 9 12A41	1a5	S	tubular	op. white	2
	IIa57	M	oval	tsp. bright navy	1
CeEt 9 12A50	IIa40	M	round	op. robin's egg blue	1
Total					**4**

Table 7. Glass Beads Identified from Champlain's *Habitation*, Quebec (Phase 3, 1624-1629).

Rank	Kidd Code	Shape	Size	Description	Oty.
1	Ia5	tubular	S	op. white	12
2	Ia11	tubular	M (?)	tsl. teal green	1
	Ia18	tubular	S	tsp. ultramarine	1
	IIa11	round	S	tsl. white	1
	IIa37	circular	S	op. aqua blue	1
	IIa39/40	round	M (?)	op. robin's egg blue (NC – IIa39; JB – IIa40)	1
	IIa57	oval	S	op. bright navy	1
	IVa1	round	M (?)	op. red; black core	1
Total					**19**

Table 8. Glass Beads from Fort St. Louis, Quebec (pre-1629).

Rank	Kidd Code	Shape	Size	Description	Oty.
1	IIa40	round	M	op. robin's egg blue	min. 9
2	IVa2	round	M	op. red with clear core	5
3	IIa55	round	S	tsp. bright navy	1
	IIa55	round	L	tsp. bright navy	2
4	IIa15	oval	S	op. white	min. 1
5	Ia5	tubular	S	op. white; slightly finished ends	1
	Iab*	tubular	M	op. white w/ 6 red & 6 gold stripes	1
	IIa34	circular	VS	op. light aqua blue	1
	IIa57	oval	S	tsp. bright navy	1
	IIIbb2	tubular	M	op. red w/ 3 blue-on-white stripes; black core	1
Total					**23**

Table 9. Comparison of Glass Beads from Champlain-Related Sites.

Kidd Code	Saint Croix (n=57)	Champlain's *habitation*, Phase 1 (n=86)	Champlain's *habitation*, Phase 2 (n=33)	Champlain's *habitation*, Phase 3 (n=19)	Fort St. Louis (n=23)
IIa40	25 (44%)	0	3 (9%)	1 (5%)	9 (39%)
Ia5	24 (42%)	33 (38%)	15 (45%)	12 (63%)	1 (4%)
IIa15	5 (9%)	10 (12%)	2 (6%)	0	1 (4%)
IIa57	1 (1.5%)	1 (1%)	1 (3%)	1 (5%)	1 (4%)
IIIb*	1 (1.5%)	0	0	0	0
IVa16?	1 (1.5%)	0	0	0	0
Totals	**57 (100%)**	**44 (51%)**	**21 (63%)**	**14 (73%)**	**12 (51%)**

Fort St. George, Maine (1607-1608). Excavated under the direction of Dr. Jeffery Brain (2007), this important, if little-known site produced a well-dated sample of glass beads.[6] Of the 162 monochrome specimens recovered, 154 are described as opaque white and oval in shape (IIa15), seven are opaque blue and round (IIa40 or IIa46), and one is too deteriorated to classify. In addition, two small multi-layered beads are present; both have an opaque red exterior and a translucent green core. One is oval (IVa7) and the other round (IVa5). Finally, a single striped bead was recovered: translucent dark blue with six (?) white stripes (similar to IIb68).

Although this English attempt at settlement differed from Champlain's in many ways, the glass bead assemblages are remarkably similar, certainly more than might be expected. Well over 95% of the beads from Fort St. George (IIa15 [93%] and IIa40/46 [4%]) appear to overlap with those from Saint Croix Island. Whatever the reason, this lack of distinction between "French" beads and "English" ones is striking and instructive. It certainly suggests that such "national" designations are not useful or accurate and should be avoided in describing these objects.

Jamestown, Virginia (1607-1623). In contrast to Fort St. George, this well-known site, the location of the first successful English settlement in North America, has received considerable archaeological attention. Most recently, the Jamestown Rediscovery project identified and excavated a substantial portion of the original (1607-1623) fort, supplying a more detailed and controlled view of this early settlement. Not surprisingly, glass beads were an important part of the artifact assemblage. These have been well described (Lapham 2001). Of the 188 beads reported from the Early Fort Period, the ten most frequently occurring are listed in Table 10.

Although the Jamestown beads do have some distinct differences, especially in the presence of Nueva-Cadiz-like and wound cone-shaped beads, the overall assemblage does not differ substantially from those of the Maine coast or Quebec. White and blue beads predominate while other colors and striped specimens are far less common.

COMPARABLE NATIVE SITE ASSEMBLAGES

So far, the bead assemblages discussed have been from French or English sites and represent the European side of the exchange/trade equation. What kinds of glass beads have been recovered from Native sites of the same time period?

Considerable research has been done on the occurrence of glass beads on Native sites in both Canada and the United States. Initial work by Kenyon and Kenyon (1983) and subsequently refined by Fitzgerald et al. (1995) defined a series of Glass Bead Periods for which specific beads styles and assemblages were present. A comparable set of Glass Bead Horizons has been defined for Five Nations Iroquois sites in the United States (Bradley 2007:42-3, 184). Although these two approaches have their differences, both agree that

Table 10. Glass Beads from Jamestown, Virginia (Early Fort, 1608-1623).

Rank	Kidd Code	Shape	Size	Description	Qty.
1	IIa56	circular	VS-S	op. shadow blue (appears to be IIa47, not IIa56)	49
2	IIa40	round	M	op. robin's egg blue	28
3	IIIc1	tubular	M	op. bright blue exterior & core; white middle layer; ground ground ends	21
4	IIa13	round	M	op. white	16
5	WI*			"cone-shaped yellow beads"	15
6	IIIc3	tubular	M	op. bright navy exterior; gray core; ground ends	14
7	IIb18	round	L	tsp. light gray w/ 8-12 white stripes	12
8	IIa15	oval	S	op. white	7
9	IIa55	round	M (?)	tsp. bright navy	5
10	IIIm1	tubular	M (?)	op. blue "star" beads with ground, faceted ends	4
	IVa19	circular	S	op. bright navy	4
Total					**175**

from 1600 to 1614, four bead varieties – simple tubular beads in white (Ia5) and dark blue (Ia19) as well as small oval beads in the same colors (IIa15, IIa57) – constitute a significant proportion of any bead assemblage (Figure 2). The other bead varieties likely to occur in assemblages from the first quarter of the 17th century include the ubiquitous round robin's egg blue (IIa40) bead as well as varying percentages of multi-layered and often decorated beads such as IIbb2, IIbb7, IIIb9, IIIbb1, IIIk3, IVa1/2, IVa19, and IVk4. These can occur as tubes with unfinished ends, finished beads, and occasionally, as wasters.

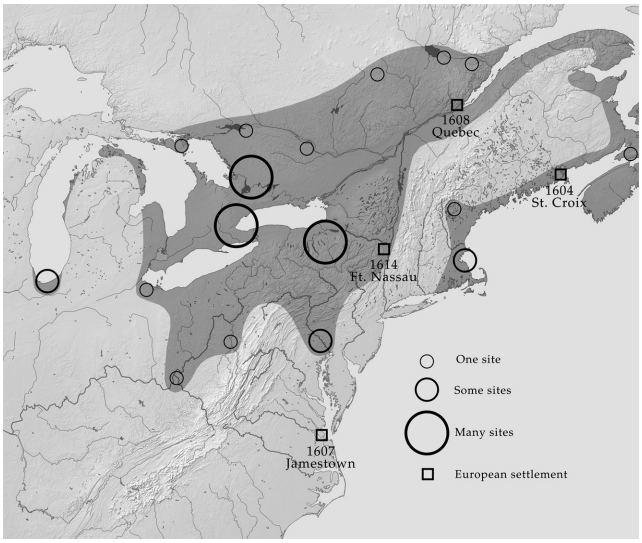

Figure 2. An estimate of French trade networks ca. 1600-1630 as defined by the occurrence of Glass Bead Period 2 beads (after Bradley 2011:33).

Three early-17th-century burial sites, one in the Canadian Maritimes and two on the shore of Massachusetts Bay, illustrate an Algonquian pattern of bead preference. The Avonport site, Nova Scotia, produced more than 1,000 glass beads, all either tubular white (1a4/5) or dark blue (Ia19) (Whitehead 1993:77). The glass beads reported by Willoughby (1924) from Winthrop, Massachusetts, are also exclusively small white (Ia5) and dark blue (Ia19) tubes. Along with these are white tubular shell beads of similar dimensions made from *Busycon* columella and a few small purple discoidal beads made from mussel shell (*Mytilus edulis*). No wampum beads are present. The glass beads from the nearby burials on Chelsea Beach, Revere, reported by Hadlock (1949:68-69), are very similar except that these are small white (IIa15) and dark blue (IIa57) ovals instead of tubes. Here too, "long strings of both the long tubular and discoidal forms of [white] shell beads" are found although the former are "rather coarse in comparison to the later historic wampum." Once again, a few thin discoidal beads made from locally available mussel shell are reported (Hadlock 1949:68-69).

Two contemporary Iroquoian sites, one Huron and the other Seneca, provide comparative examples from further inland. The Huron Warminster site, the likely location of Cahiagué visited by Champlain in August 1615, has yielded a substantial sample of glass beads. From a total of 426 beads, the most frequently occurring varieties are: 1) Ia5, op. white tubes (n=177 [42%]); 2) IIa15, op. white ovals (n=119 [28%]); 3) IIa57, tsp. dark blue ovals (n=44 [10%]); and 4) Ia19, tsp. dark blue tubes (n=23 [5%]). Small percentages of other beads, including striped and multi-layered specimens, are present as well (Fitzgerald et al. 1995:128, Table 2).

To the south, the Seneca Cameron site, located in the Genesee River drainage of western New York, was likely occupied between 1595 to 1610 (Wray et al. 1991:411).[7] Of the site's total of 522 glass beads, the most frequently occurring varieties are: 1) Ia4/5, op. white tubes (n=200 [38%]); 2) IIa15, op. white ovals (n=114 [22%]); 3) IIa40, op. robin's egg blue round (n=81+ [16%]); 4) IIa46/47, op. shadow blue round (n=37 [7%]); and 5) IIa13/14, op. white round (n=28 [5 %]). Other varieties present include: IIa43 (n=19 [4%]), IIa57 (n=12 [2%]), Ia19 (n=9 [2%]), IIa8 (n=6 [1%]) as well as small numbers of striped and multi-layered beads (Wray et al. 1991:317-321, Table 7-67). Discoidal marine-shell beads are also a significant component of the Cameron site assemblage.[8]

As Bill Fitzgerald (1990:167, Figure 12) has argued, the distribution of these tubular white and dark blue beads essentially marks the extent of French influence during the early decades of the 17th century. Sites with a significant number of these beads occur as far south as the Susquehannock Schultz site in Pennsylvania (Kent 1984:218-22; Smith and Graybill 1977:54, 57) and as far west as the Oneota New Lenox site at the foot of Lake Michigan (Billeck 2010). Wherever they were made and however they reached Native people across the Northeast, this group of glass beads forms a remarkably consistent horizon marker on both European and Native sites.

THE QUESTION OF PRODUCTION: GLASS BEADMAKING IN WESTERN EUROPE

With growing affluence as well as the centralization of political authority, the finely made decorative arts of Italy increasingly served as markers of status and wealth during the 16th century. Glassware, especially made in the Venetian style, was one of the most visible of these indicators of taste and style (Page 2004). During the late 16th and early 17th centuries, glassmaking in western Europe occurred at two

fundamentally different levels. One was the traditional production of glass for bottles, flasks, windows, and other utilitarian uses, which may have included simple beads. The second focused on replicating the elaborate tableware and drinking glasses of Italy that otherwise had to be imported. This level of glassmaking was an industrial, not cottage, undertaking, requiring highly skilled artisans, technically demanding facilities, and substantial financing (whether entrepreneurial or municipal) to produce not just the highly desired *cristallo* glass but also the multi-colored, multi-layered glass accompanying it.

The Dutch Republic

While glassmaking, like many of the other fine arts, was initially centered in Antwerp in the southern portion of the Spanish Netherlands, with the Dutch Revolt in 1568 and the subsequent capture of Antwerp by the Spanish 17 years later, Amsterdam quickly emerged as the new center for glassmaking (Liefkes 2004:227-235). The history of these glasshouses, especially those specializing in *façon de Venise* glass, is well documented and indicates continued production of glass beads as well as tablewares and other items from 1601 into the 1670s (Baart 1988; de Roever 1991:156-173, 193; Hudig 1923; Karklins 1974).

The documentary record of beadmaking in Amsterdam has been complemented by a considerable amount of archaeological evidence. As early as 1960, van der Sleen observed that not only beads but production waste could be found in several locations in and around the city (Karklins 1974; van der Sleen 1963, 1967). Supplemented by Karklins' (1985) ongoing studies, Jan Baart (1988) provided the first systematic review of both documentary and archaeological evidence for beadmaking in Amsterdam. Most important have been recent excavations at two glasshouses by the Archaeological Department of the Bureau of Monuments and Archaeology, under the direction of Jerzy Gawronski. These include the Carel-Soop glasshouse (KLO10) that operated between 1601 and 1624 (Hulst 2013:28-29) and the second Two Roses glasshouse (RO21), located on the Rosengracht, in use between 1657 and 1676 (Gawronski et al. 2010).

It is the Carel-Soop glasshouse that is of particular interest here. Although several deposits of waste glass, including beads, had been found on the Kloveniersburgwal in central Amsterdam (KLO3 and KLO8), as well as on the Keizersgracht (KG10),[9] the actual production facility remained unknown until the Archaeology Department salvaged a portion of the site (KLO10) in April 2001. Among their finds were the base of a large, circular glass oven, a smaller rectangular annealing oven, and material apparently from the production floor. In terms of construction, the excavated oven is very similar to that illustrated by Antonio Neri in 1669 (Liefkes 2004:242, Figure 12). The Carel-Soop glasshouse was a large facility occupying three house lots (excavations occurred in the backyard of one lot). Michel Hulst, a glass researcher with the Archaeology Department, estimates that as many as 80 people had been employed there, with six glassblowers working at each of the three ovens.

In addition to the structural evidence, a large quantity of waste glass and other material was recovered, including large crucible fragments up to 60 cm in diameter, chunks of waste glass in many colors, a great number of production tube fragments (several showing the marks from pontil attachment), and examples of drinking glass and bead wasters. The Carel-Soop assemblage is dominated by production waste and contains relatively few finished beads (Plate IXB). Hulst believes this material was simply left behind when the glasshouse closed.

Through the courtesy of Jerzy Gawronski, I was able to make an initial inventory of the bead-related glass from this site in November 2005. With his permission, that inventory is reproduced in Table 11. As can readily be seen, nearly every style of glass bead found, not just at Saint Croix Island but on Native sites across the Northeast, is represented in the Carel-Soop assemblage.

France

There is no doubt that French traders used simple glass beads during the first decade of the 17th century. Lescarbot (1911, II:322) describes "necklaces and armlets or chaplets of tubes of white and blue glass" among the presents that M. de Poutrincourt presented to Native Americans at a place in Maine called Marchin Bay in 1604. The question of where these beads were manufactured is, however, quite a different matter.

France's fascination with Venetian glass profoundly affected its glassmaking. Unlike the Dutch Republic, glassmaking in France benefitted traditionally from royal support; Henry IV in particular encouraged the establishment of new glasshouses. In 1598, he granted a factory in Rouen the exclusive right to manufacture Venetian-style glass. The main French center for the production of glass *à la façon de Venise* during the late 16th and most of the 17th centuries was, however, the city of Nevers, located on the upper Loire River (de Rochebrune 2004:148).

Although some scholars have suggested that French producers, especially in Rouen and Paris, were important

Table 11. Glass Beads and Associated Wasters from the Carel-Soop Glasshouse (KLO9), Amsterdam (1601-1624).

Group	Kidd Code	Size	Shape	Description	Qty.
I. Plain production tubes	Ia1, IIIa1		tubular	each ~50%, red tubes are the most common	
	Ia5, IIIa8		tubular	white tubes present but not common	
	Ia16		tubular	shadow blue tubes were less common	
	Ia20, IIIa12		tubular	each ~50%, dark navy tubes common	
II. Striped production tubes	Ib*		tubular	op. red w/ 3 white stripes	
	Ib*		tubular	op. red w/ 8 white stripes	
	Ib3		tubular	op. black w/ 3 red stripes	
	Ib*		tubular	op. black w/ 5 white stripes	
	Ib*		tubular	op. black w/ 3 red & 3 white stripes	
	Ib*		tubular	op. robin's egg blue w/ 3 white stripes	
	Ib*		tubular	op. light aqua blue w/ 8 red stripes	
	Ibb1		tubular	op. red w/ 3 blue-on-white stripes	
	Ib'2		tubular	op. white w/ 3 sets of spiral blue stripes	few
	Ib'*		tubular	op. white w/ 8 spiral blue stripes	few
	IIIb1		tubular	op. red w/ 6 white stripes; black core	
	IIIb*		tubular	op. red w/ 10 white stripes; black core	
	IIIb7		tubular	op. shadow blue w/ 8 white stripes; white core	many
	IIIb9		tubular	tsp. bright navy blue w/ 15 white stripes; white core	many
	IIIbb1		tubular	op. red w/ 3 blue-on-white stripes; black core	many
	IIIbb6		tubular	op. black w/ 3 white-on-red stripes; black core	
III. Chevron production tubes	IIIk*		tubular	op. honey gold w/ white & red layers	several
	IIIk3		tubular	op. bright navy blue w/ white & red layers	some
	IIIn*		tubular	op. white w/ red & green layers	
IV. Plain beads	IIa6	M-L	round	op. black	4
	IIa13	M	fat oval	op. white	3
	IIa20	M-L	round	op. cinnamon	2
	IIa40	M-VL	round	op. robin's egg blue	7
	IIa44	M	circular	tsp. cerulean blue	1
	IIa46	M-L	round	op. shadow blue	4
	IIa48	M-L	round	op. dark shadow blue	4
	IIe*?	L	round	tsp. bright navy w/ 8 spiral ridges	1
	IVa1	S-M	circular	op. red; black core; flattened ends	2
	IVa*	M/L	circular	tsp. bright navy; white core	9
	Total				**37**

Table 11. Continued

Group	Kidd Code	Size	Shape	Description	Qty.
V. Beads with stripes	IIb6	VL	round	op. red w/ 6 white stripes	1
	IIb8	L	round	op. red w/ 6 mustard stripes	1
	IIb18	M-L	round	tsp. "gooseberry" w/ 12 white stripes	10
	IIb48	M-L	round	op. mustard w/ 8 red stripes	8
	IIb*	VL	flat	op. mustard w/ 8 red stripes	2
	IIb50	VL	flat	op. mustard w/ 8 white stripes	2
	IIb54	M-L	round	op. light aqua w/ 8 red stripes	2
	IIb55	M-L	flat	op. light aqua w/ 6 red stripes	5
	IIb*	VL	round	op. light aqua w/ 8 red & 8 blue stripes	1
	IIb57	L-VL	round	op. robin's egg blue w/ 4 white stripes	3
	IIb61	M-L	round	op. shadow blue w/ 6 red stripes	7
	IIbb2	M-VL	flat	op. red w/ 3 blue-on-white stripes	3
	IIbb*	M	round	tsp. mustard w/ 3 red-on-white stripes	17
	IIb'*	L	round	tsl. cerulean blue w/ 3 white spiral stripes	1
	IIb'*	VL	round	op. black w/ 3 white spiral stripes	1
	IVb5	M	round	op. red w/ 6 white stripes; black core	1
	IVnn*	L	round	op. white w/ 8 red & 8 blue stripes over a ridged red core	5
	Total				**70**
VI. Eye beads	IIg4	M-L	round	op. white w/ blue eyes	2
	IIg*	M	round	op. red w/ white eyes	1
	Total				**3**
VII. Chevron beads	IVk4	M-VL	round	classic op. blue "star" bead	2
	IVn*	VL	round	4 red, 4 blue, & 4 green stripes over a ridged op. red core	3
	IVn*	VL	round	6 red & 6 blue stripes over ridged op. red core	1
	IVn*	VL	round	4 red, 4 blue, & 4 gold stripes over ridged op. red core	3
	IVn*	VL	round	6 red & 6 green stripes over ridged op. red core	6
	IVn*	VL	flat	6 red & 6 green stripes over ridged op. red core	6
	Total				**21**

suppliers of glass beads during the first decade of the 17th century (Fitzgerald et al. 1995:122; Turgeon 2001:64, 70), a careful review of the historical and archaeological literature does not support this interpretation. Most of the Venetian-style glass made in France during the late 16th and early 17th centuries was produced for the court, the church, or other high-end customers. Glass bead production has yet to be documented archaeologically (de Rochebrune 2004:150-163). Turgeon's analysis of inventories and contracts in Paris does indicate that beads were manufactured there, but it is

often unclear what kind of beads these were or the use for which they were intended. Indeed, since beadmakers were members of the paternostriers guild (Turgeon 2001:68), it is likely that rosary beads were their primary product. In addition, several of the glass beads illustrated by Turgeon from the Jardins de Carrousel in Paris fit comfortably within known late-16th-century Venetian assemblages.[10] This does not mean that glass beads for trade were not produced in France, rather that the evidence to demonstrate this has yet to be presented.

The one exception might be the round, robin's egg blue beads (IIa40) that are ubiquitous on New World sites of the last half of the 16th century and well into the 17th (*see* Lapham 2001 for a summary). These were often described as "turgyns" (turquoise) in the contemporary notarial records (Turgeon 1998:601-602, 2001:76). Peter Francis has argued that these were manufactured in France (2009:78-79) and, given the extremely broad distribution of these beads, spatially and chronologically, it is likely that they were made in more than one location.

England

The demand for Venetian glass also inspired the production of high quality glassware in England during this time. There, as in France, production was initially for the court and upper classes with drinking glasses as the particular focus. To date, no archaeological evidence of glass beadmaking has been reported from any of these glasshouses (Willmott 2004). The exception is the recent discovery of beadmaking at the Hammersmith Embankment in west London. This appears to have been a small-scale operation undertaken by Sir Nicholas Crisp in an attempt to copy Amsterdam bead styles, perhaps for the African slave trade. Although it remains uncertain when production began, probably after 1620, the facility did not function after 1640 (Geoff Egan 2008: pers. comm.). Karlis Karklins (2014: pers. comm.) has examined the recovered beads and recorded 42 varieties. Interestingly, none of these have correlatives in the Saint Croix assemblage.

DISCUSSION

The glass beads from Saint Croix Island fit comfortably with other well-documented early-17th-century assemblages from across the Northeast; indeed, they are remarkably similar. The two most common bead varieties at Saint Croix Island – round robin's egg blue (IIa40) and tubular white (Ia5)[11] – also rank either first or second in the assemblages from the other French and English sites discussed. This similarity extends to the overall bead assemblage as well. Whether the sites are European (as distributors) or Native (as consumers), the glass beads appear to be remarkably consistent during the first decade of the 17th century. This assemblage consisted primarily of simple tubular beads in white (Ia5) and dark blue (Ia19) as well as small oval beads in the same colors (IIa15, IIa57), along with the ubiquitous round robin's egg blue beads (IIa40) and a small number of multi-layered, multi-colored beads. After the establishment of the New Netherland Company in 1614, Dutch-related trade used a much higher percentage of multi-layered, multicolored beads; glass bead assemblages among the Five Nations began to differ substantially from those in Quebec and Ontario (Bradley 2007:42-43).

In spite of the similarities, there may have been subtle differences in the glass beads preferred by English and French entrepreneurs. English sites, for example, yield primarily oval or round beads while tubular beads predominate on French sites. However, in either case, color preferences remain the same: white and dark blue.

Given these color preferences as well as the apparent Native demand for small tubular beads, one might speculate about the role glass beads may have played in the development of wampum, the small tubular beads of white and dark purple marine shell that served as "the source and mother of the beaver trade" after 1624.[12] What is important here is that no shell beads were recovered from Saint Croix, and those from the Champlain-related sites in Quebec are discoidal in shape, not tubular.

Although some scholars have suggested that discoidal shell beads were made in France (Turgeon 2001:70-72), it is clear that they were an established form long before European contact. Discoidal marine-shell beads have been documented on Native sites across the Northeast for nearly 3,000 years (Heckenberger et al. 1990:127) and are the most common shell bead form on Iroquoian and Algonquian sites of the late 16th and early 17th centuries (Petersen et al. 2004:17-20; Wray et al. 1991:411). In fact, they may be what Robert Juet saw in September 1609 when he described the many "stropes of Beads" brought aboard *de Halve Maen* by local Mahican people to revive an apparently dead (drunk) head man (Jameson 1909:2223). The archaeological evidence certainly indicates that the most likely form of shell used for ritual purposes at the turn of the 17th century was a string of discoidal beads.

The glass beads from Saint Croix Island and related sites also supply clues to their production and distribution. In terms of production, it is clear that, based on visual evidence, a very strong similarity exists between the beads produced in the Carel-Soop glasshouse and those recovered

from both European and Native sites in the Northeast. The next steps would be to make a formal comparison between the beads from Amsterdam and North America, then conduct an appropriate analysis of comparable specimens to determine chemical signatures or other quantitative markers. An example is the work that has been done over the past 20 years on those ubiquitous, round, robin's egg blue beads (IIa40). Neutron activation testing has demonstrated that, although visually similar, some late-16th-century beads have a different chemical composition than some early 17th-century examples (Chafe et al. 1986; Hancock et al. 1994). It remains unclear whether these differences reflect temporal or production differences (Fitzgerald et al. 1995). To date, none of the beads from St. Croix Island have been analyzed. This would be a logical next step and could provide a useful basis for comparison with the ongoing analyses of samples from Amsterdam and other production centers.

Issues of production can be clarified through well-designed analysis; distribution is likely to remain much murkier. Simple designations such as "English," "Dutch,"or "French" not only mislead, they blur the fundamental reality of early-17th-century commercial activity. At that time, Spain was the primary enemy of the emerging nation-states in western Europe. As small Protestant countries, England and the Dutch Republic were frequently allied against the Spanish. Although Catholic, France likewise saw Spain as a threatening neighbor with territorial ambitions. Obstructing those ambitions was a fundamental part of French policy, regardless of who was king.

Such factors helped create new and diverse economic partnerships. A good example is Lambert van Tweenhuysen who was born in the old Hanseatic town of Zwolle and became one of Amsterdam's most successful merchants with economic ties from Archangel to Istanbul and northwest Africa to northeast North America (Hart 1959:39-44). Among Van Tweenhuysen's close contacts were two La Rochelle merchants, Samuel Georges and Jean Macain, who had strong connections with the emerging fur trade in Terra Nova. In fact, Georges and Macain shared a one-fifth ownership in a new company established in Rouen in 1604 to promote trade and colonization in Canada. The director of the company was Pierre Dugua, Sieur de Mons. Although no documentary trail connects Amsterdam glass beads with the provisioning of the Saint Croix Island expedition, it is not a stretch to suggest that beads from the Carel-Soop glasshouse could easily have been incorporated into a cargo from Rouen. Indeed, van Tweenhuysen continued to play a very strong role in the emerging fur trade: as leader of the first Dutch company to trade in the Hudson Valley, as a director of the New Netherland Company, and, finally, through his own firm. Only after the West India Company received a monopoly on the Hudson River trade did van Tweenhuysen's interests move on (Hart 1959:40). Van Tweenhuysen was not a unique case. Another successful Amsterdam fur trader, Arnout Vogels, also established a partnership with two Rouen merchants in June 1611, specifically to trade in Canada. As with van Tweenhuysen, the fur trade became Vogels' primary interest and within a few years, he too shifted his focus to the Hudson Valley (Hart 1959:15-16, 20-41).

These connections among Dutch, French, and English entrepreneurs during the first decades of the 17th century help to explain the overall similarity in bead assemblages across the Northeast. There were very few sources for high-quality glass beads and it appears that buyers purchased much of their trading stock from the same source. In all likelihood, that source was the Carel-Soop glasshouse.

CONCLUSION

Traditionally, most researchers have looked to Venice as the likely source for glass trade beads, especially the multi-layered and multi-colored varieties (Francis 2009; Lapham 2001). Yet, based on archaeological evidence and visual comparison, the glass beads from Saint Croix and other Champlain-related sites in Quebec were most likely made in Amsterdam. This seems especially the case with complex and distinctive bead varieties, such as IIbb1 and IIIk3, that are present as production tubes, wasters, and finished beads at the site of the Carel-Soop glasshouse (KL010) in Amsterdam. The presence of production tubes and beads for the more generic styles (IIa40, Ia5, and IIa57) at KLO10 and related waster deposits (KLO3 and KLO8) suggest that at least some of the beads of these styles found at Saint Croix Island and in Quebec were produced in Amsterdam as well. The beads produced at the Carel-Soop glasshouse in Amsterdam are a material expression of the culturally diverse partnerships that sponsored many of the early-17th-century voyages to Terra Nova.

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in *Beads* and letting me express my opinions, even when he did not agree with them.

ENDNOTES

1. *La habitation de Champlain* is part of the larger Place-Royale archaeological district, the first permanent settlement area in New France. Several excavations have been undertaken in this area. *See* Niellon and Moussette (1985) for an initial report. My thanks to Claudine Giroux of the Ministère de la Culture, des Communications et de la Condition Feminine, Quebec, for her assistance in allowing me to study this assemblage.

2. This series of forts and governors' residences was excavated by Parks Canada in 2005, 2006, and 2007. The Parks Canada site code is 38G and most of the beads I saw were from one lot, 38G29A28. I thank Paul-Gaston l'Anglais for his assistance in allowing me to study these beads.

3. Although I was able to examine several of the beads from Champlain's *habitation*, limits of time and collection availability made it impossible to locate all the specimens that had been recovered. Claudine Giroux therefore informed me that another researcher, Nadia Charest, a graduate student from Sheffield University, had spent a week examining the bead assemblage in 2008. Ms. Giroux permitted me to copy the summary notes that Ms. Charest had made. Although Ms. Charest also used the Kidd system to classify the beads, we each appear to have applied that system in slightly different ways. The descriptions in Tables 3-7 are therefore based on my application of the Kidd system. I am extremely grateful to Ms. Charest for the opportunity to utilize her data. Any errors or omissions are my, not her, responsibility.

4. At Fort St. Louis, 18 (42 %) of the 41 beads recovered from the pre-1629 context were shell. Of these, 16 were white and two were dark gray to black. These beads were generally 6-8 mm in diameter and 2-4 mm in thickness. They appear to have been made from both *Busycon* and *Merceneria* species. Interestingly, no tubular beads were observed. Although I did not have the opportunity to count the shell beads from the three phases at Champlain's *habitation*, my sense is that similar shell beads were also present in a comparable degree.

5. Glass beads, in particular white tubes (Ia5) and ovals (IIa15), were also recovered from the pre-1642 level at Pointe-à-Callière in Montreal. These beads appear to be related to Champlain's brief use of the site during the summer of 1611 (Brad Loewen 2009: pers. comm.).

6. Brain (2007:133-134) reported 166 drawn glass beads (counting 29 half beads as 15 whole beads) and 2 wound beads although there appear to be provenience issues with the latter. In addition, Brain utilized his own classification system for describing these beads and this makes it more difficult to compare them with those from other sites. I have assigned Kidd and Kidd numbers to these beads based on Brain's descriptions and the published photographs, and have not examined the beads myself.

7. It should be noted that the majority of the beads were recovered from mortuary contexts, and that the distribution of bead varieties from mortuary (intentional) and non-mortuary (random) contexts on the same site can be significantly different.

8. A total of 1,353 marine-shell beads were recovered from the Cameron site, primarily from burials. Of these, 1,059 (78%) are discoidal. These occur in three sizes: small (averaging 3.5 mm in diameter), medium (averaging 6.4 mm in diameter), and large (averaging 11.6 mm in diameter). Medium-size beads are the most frequent. The majority of these beads appear to be white, although color is not specified (Wray et al. 1991:342-346).

9. Recent re-assessment of the KG10 assemblage now indicates these beads were probably from the first Two Roses glasshouse (1621-1657) located on the Keisersgracht, and not from the Carel-Soop glasshouse as previously suggested (Baart 1988:70). My thanks to Michel Hulst (2010: pers. comm.; 2013:28-29) for this information.

10. The Gnalic wreck, a Venetian merchant vessel that sank off the Dalmatian coast around 1580 to 1600, has provided a large assemblage of comparable Venetian-made glass beads (Hugh Willmott 2008: pers. comm.).

11. George Hamell has argued that among the Northeast Woodland peoples, "sky-blueness" appears to be interchangeable with "whiteness" in most mythic and ritual contexts (Hamell 1983:6, 1992).

12. Petrus Stuyvesant to the WIC Directors, April 1660 (O'Callaghan and Fernow 1853-1887, 14:470). For a more comprehensive evaluation of the relationship between Glass Bead Period 2 beads and the origins of wampum, *see* Bradley (2011) and Hamell (1996).

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