THE BEADS FROM AN 18TH-CENTURY ACADIAN SITE, PRINCE EDWARD ISLAND, CANADA

Helen Kristmanson, Erin Montgomery, Karlis Karklins, and Adelphine Bonneau

Excavation of the Pointe aux Vieux site, an 18th-century Acadian house located on western Prince Edward Island, Canada, yielded a significant assortment of beads. Among the glass and bone specimens are ten black beads decorated with undulating yellow lines around the middle. Commonly called "rattlesnake" beads by collectors, this stylistic form has been found at many sites in North America as well as elsewhere in the world. Unlike the other beads, however, the ones from Pointe aux Vieux are not glass but formed by melting an igneous rock called "proterobas" to form a totally opaque black glass. The only known source of beads made from this material is the Fichtelgebirge region of northeastern Bavaria. While black ball buttons made of proterobas have been encountered at various sites in the eastern United States and Western Europe, this is the first recorded instance of proterobas beads in North America. It is hoped that this article will lead to more such beads being identified in archaeological collections so that their distribution and temporal range may be determined.

INTRODUCTION

The Pointe aux Vieux site (CdCx-5) is located at Low Point on the western shore of Malpeque Bay on northwestern Prince Edward Island (Figure 1). Known as the Garden of the Gulf, Prince Edward Island is Canada's smallest province, encompassing 5620 square kilometers. Surrounded by over 1100 kilometers of shoreline, the island sits at minimum about 13 km from the mainland and consists mostly of agricultural lands, forest, and rolling hills.

Prince Edward Island's long history of human occupation began about 13,000 years ago, long before it became an island, when the warming climate melted the Laurentide ice sheets and made way for the arrival of plants, animals, and people. Today the Mi'kmaq, who call the island Epekwitk, are recognized as the Island's Indigenous population and their history is documented orally, archaeologically, linguistically, textually, and ethnographically. By comparison, Europeans were relative newcomers to the island, permanently settling there in 1720.

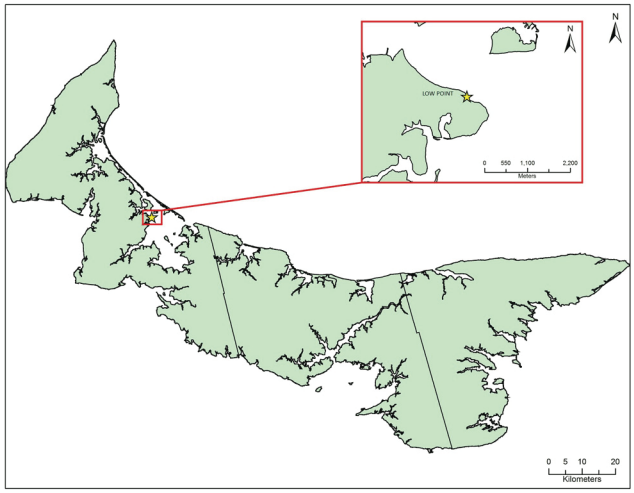

Figure 1. Prince Edward Island showing the location of the Pointe aux Vieux site (CdCx-5) in Low Point (graphic: Erin Montgomery).

HISTORICAL CONTEXT

The Pointe aux Vieux site represents the remains of an Acadian house built and inhabited for 30 years, or parts thereof, between 1728 and 1758, as part of the first non-Indigenous settlement in western Prince Edward Island. Though archaeological evidence points to a comfortable existence at this picturesque location, ongoing political upheaval shaped life during the 17th and 18th centuries as Britain and France vied for territorial control of Atlantic Canada and the lucrative cod fisheries off their coasts. In 1713, the Treaty of Utrecht awarded the French territories of Newfoundland and Acadia (present-day Nova Scotia) to the British, but allowed the French to retain most of New Brunswick, Île Royale (present-day Cape Breton), and Île Saint Jean (present-day Prince Edward Island). In an attempt to secure their loyalty, British authorities pressured Acadians to take an oath of allegiance to the British Crown and move to territory under the French regime, such as Île Saint Jean (Arsenault 2009). Few chose to immediately leave Acadia, however, adhering to the policy of neutrality they

had maintained for generations. The Acadian community continued to prosper and by the 1740s, the population had grown to 10,000.

Beaubassin was a major Acadian settlement during this time. Established between 1671 and 1672, it was a prized site for its strategic location at the Isthmus of Chignecto between French and British territories. Here, the Acadians were constantly exposed to recurring hostilities and political pressures. This, in combination with the pressures associated with a growing population, may have played a role in the decision to relocate to other areas such as Île Saint Jean.

The Acadian Settlement at Malpeque

Although the Mi'kmaq had regular contact with European fishers and traders in the 17th century, permanent European settlement on Île Saint Jean did not take place until 1720, beginning with the French settlement, Port-la-Joye (now Skmaqn–Port-la-Joye–Fort Amherst National Historic Site), and followed by numerous Acadian settlements across the Island. One such settlement, known as Malpec or Malpeque, was founded by the families of Pierre Arsenault II and his wife Marie-Anne Boudrot, their son, Charles, and his wife, Cécile Breau, and Jean Lambert (spouse unidentified), who in 1728, said goodbye to their homes in Beaubassin, Nova Scotia.

Malpeque was the first non-Indigenous settlement in western Prince Edward Island and the new settlers appear to have respected the Mi'kmaq name for the place, *Maqpa'q*, meaning "a large body of water." The Acadians who settled there were likely drawn by the forests, wild game, and fertile soil. Several accounts of the period praise the quality and accessibility of the land, sea, and resources. But while the settlement at Malpeque had access to a bountiful harbor, the settlers were ordered to focus on agricultural production to supply the Fortress of Louisbourg. Only the settlements of Havre Saint Pierre and Tracadie were permitted to engage in commercial fishing, though archaeological evidence confirms that the settlers at Malpeque Bay supplemented their diet with a variety of fish, bird, and wild game species (Kristmanson 2015a, b). Overall the archaeological record points to a fairly comfortable existence, but the settlement at Malpeque periodically endured agricultural hardships including three consecutive years of poor crop yields from infestations of field mice, grasshoppers, and scald.

The French government at Louisbourg commissioned the first Island census in 1728. At this time, the settlement at Malpeque, populated only by the Arsenaults and Lamberts, was the smallest of the six enumerated communities on the island, comprising only 17 men, women, and children (La Roque 1906). Over the next three decades, the settlement expanded approximately 15 km along the shoreline between Green Park and Grand River. Most of the settlers were Acadians from the Beaubassin region, but there were others who hailed from the Acadian settlements of Port-Royal, Grand-Pre, Pisiquid, and Cobequid, as well as Île Royale (Cape Breton), Brittany, Normandy, and Île d'Orleans.

By the time Joseph de la Roque conducted the last Island census under the French regime in 1752, the settlement at Malpeque consisted of at least 201 people in 32 households. The community was supported by infrastructure including farmsteads, grist mills, a windmill, church, and cemetery. While historical records provide no information for the settlement's evolution between 1752 and 1758, the population continued to increase, especially during 1755-1756, when the British began to deport Acadians from the present-day Maritime Provinces. Under this plan, the British military forcibly removed the Acadians, sequestering men from their families, escorting families out of their homes before they could gather their belongings, and often setting fire to their houses and barns to prevent them from resettling. Many Acadians ended up in the British colonies, were put in jail, or died at sea while being transported to France. Others escaped to Île Saint Jean, which provided a relatively safe haven until 1758, when the British captured the Fortress of Louisbourg for the second time.

Shortly after the siege at Fortress Louisbourg, British Lieutenant-Colonel Lord Andrew Rollo brought troops to Île Saint Jean, but his objective of mobilizing a mass deportation plan was diverted by unforeseen factors. For example, their plan to march the Acadians roughly 65 km across land to waiting ships at the colonial capital, Port la Joye, was abandoned due to the poor health of the settlers at Malpeque Bay (Lockerby 1999). Moreover, the British had underestimated the size of the Island Acadian population, arriving with a fleet capable of transporting only those within reach of Port la Joye. This was compounded by changing priorities within the British military which resulted in inaction, giving the Malpeque Acadians time to systematically pack their belongings and escape by sea. The Mi'kmaq came to the aid of the Acadians during this time of upheaval, helping some to find shelter in the woods and others to load their livestock onto boats. Most Acadians moved several times before resettling in the Maritime Provinces, Gaspé Peninsula, Magdalen Islands, Miquelon, Louisiana, or France. While some Acadians returned to settle on Prince Edward Island, the house at Pointe aux Vieux, and the settlement at Malpeque, were never restored (Arsenault 2009; Kristmanson 2015a, b; Lockerby 1999, 2003).

THE ARCHAEOLOGICAL STUDY OF POINTE AUX VIEUX

Telltale signs of the Acadian settlement at Malpeque Bay have long been reported in the Low Point area. In 1846, physician and geologist Abraham Gesner (1847) reported encountering "the site of an old French village and a large chapel" along this shoreline during his geological survey of Prince Edward Island. Here he also mentioned seeing a number of human bones scattered along the base of a low cliff where "the sea has advanced rapidly upon the shore, and has intruded upon the cemetery" (Gesner 1847). Similar observations were made in an Island newspaper, *L'Impartial* (1893:2), by an anonymous person who had visited the site and, guided by the current landowner, noted several vestiges of the past including depressions associated with cellars, a perfectly preserved well, and skeletal remains peeking out of the erosional face at Low Point. Historical maps, such as those produced by Captain Samuel Holland (1765) and Charles Morris (1768), show what remained of the Acadian settlement at Malpeque Bay as much as a decade after the Deportation. In these maps, the Pointe aux Vieux site appears to be situated behind a larger building nearer the shore and represented by Morris as a "Chapple" (Figure 2).

A brief archaeological assessment was conducted in the area in 2001 because bones were found extruding from the bank. These remains were faunal and found in association with other artifacts consistent with 18th-century Acadian sites, including Saintonge pottery, square nails, and pipe stem fragments (Buchanan 2001). Though two archaeological features were identified during this assessment (a domestic refuse pit and a cellar), the Pointe aux Vieux site was not archaeologically studied until 2007, when it was rediscovered during a shoreline survey by Dr. Helen Kristmanson (Government of Prince Edward Island) and Jesse Francis (Parks Canada/Mi'kmaq Confederacy of Prince Edward Island). The aim of the survey was to retrace the steps of William Wintemberg, National Geological Survey archaeologist, who surveyed and tested numerous locations along the Island's north coast between Malpeque Bay and Cable Head in 1913. The research objective was to locate and consider the effects of coastal erosion on the 18 precontact sites he identified in Malpeque Bay (Kristmanson 2008; Wintemberg 1914). If he noticed it, Wintemberg did not identify or record the Pointe aux Vieux site, his main purpose being the discovery of Indigenous sites.

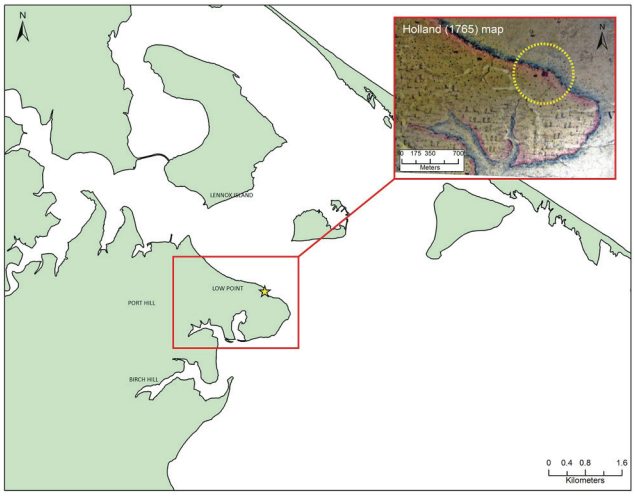

Figure 2. The location of the Pointe aux Vieux site. The inset shows the disposition of the church and house in 1765 (graphic: Erin Montgomery).

At this location, Kristmanson (2008) and her team encountered a cellar feature perched at the water's edge. This evidence, combined with 19th-century accounts of bones showing in the exposed soil profile, suggests that the church and cemetery associated with the settlement at Malpeque have been lost to erosion, leaving only the subsurface house remains partly exposed in the shoreline bank.

We do not know who owned the house at Pointe aux Vieux nor whether it was home to a single family or successive occupants. Given the circumstances under which the site was evacuated, the inhabitants were likely able to pack their belongings, leaving behind only fragmentary detritus. Archaeological evidence points to an original build and a later renovation by a single or extended family (Kristmanson 2015a, b). The census records of 1752 (La Roque 1906) offer no architectural information but provide a glimpse of the Acadian families at Malpeque Bay including the names and ages of all family members and residents of each home, their country of origin, years as an Île Saint-Jean resident, types of crops in cultivation, types and number of livestock, and, occasionally, whether they owned a boat. There are few details describing when Acadian families were granted parcels of land or by what mechanism. On occasion La Roque notes that some parcels were granted through verbal permission. Neither census records nor historical maps (e.g., Holland 1765 or Morris 1768) associate particular plots of land with named Acadian owners.

Methodology

Archaeological excavations at Pointe aux Vieux were conducted between 2008 and 2011 (Kristmanson 2009, 2015a, b). Preliminary investigations began with a geophysical survey of the area using a Bartington

601Grad fluxgate gradiometer magnetometer. The geophysical survey results were inconclusive and offered little information regarding remnant structural features at the site (Gendron 2008). Shovel testing produced a small number of non-diagnostic artifacts but, encouraged by the presence of Saintonge coarse earthenware which is found on archaeological sites in the Maritime Provinces dating from the late 17th to mid-18th centuries, archaeological investigations proceeded (Kristmanson 2008).

A 5-cm elevation map gave a clear view of the cellar depression and basic site topography, but indicated no other cultural features. Further testing by 50cm^2 shovel tests and 1m^2 units helped determine the most productive location for excavations. Using a grid system of 1m^2 squares tied to a fixed datum, 26 units were hand troweled. Back dirt was screened through a quarter-inch mesh and soil samples were removed for water screening and flotation.

Architectural evidence

Little is left of the Acadian house at Pointe aux Vieux, which has been quietly disappearing for 250 years. Nonetheless, the collapsed foundation and other features came into view as the archaeologists removed the overburden (Figure 3). Although the foundation was not intact, a pattern could be seen to suggest a footprint of roughly 7 x 6 m oriented on a NW-SE axis, similar to the foundations at the coeval Belleisle sites in Nova Scotia (Christianson 1984; Kristmanson 2015). Eighteenth-century accounts of Acadian homes by Hale (1731) and MacDonald (1795) suggest the house was likely a one-and-a-half-story dwelling with one main room where the occupants slept, cooked, and ate. Archaeobotanical evidence suggests that the structure sat in a clearing and had a thatched steep-pitched roof made from locally available rush grasses (Faucher 2012). The presence of two decomposed hewn planks, an excavated cellar, foundation stones, hand-wrought nails, and a very small amount of what may be mortar or plaster, suggests that the house was wood-framed with a stone foundation. A few pane glass fragments indicate the presence of at least one window.

A depression approximately 1.25 m below ground surface is indicative of a root cellar with a natural sandstone floor underneath part of the house. An outdoor bake oven conjoined to an indoor fireplace is at the eastern end of the dwelling. All that remains of the oven are field stones about the size of a football set into a horseshoe-shaped clay base, while two stonework footings indicate where the fireplace stood. In the cellar, a layer of highly organic soil containing thousands of fragmentary artifacts and ecofacts – including bird, fish, and animal bones, ceramics, smoking pipes, glass, gun shot, and charcoal fragments – was found under 40-50 cm of clay and rock. This suggests that waste was thrown or fell into the cellar, at least for a time, and was sealed with a thick and precisely laid layer of clay and rock in a subsequent episode of construction. There is no evidence to suggest that the site was used before or after the Acadian period (1728-1758) (Kristmanson 2015b).

Figure 3. The foundation of the house at Pointe aux Vieux (photo: Helen Kristmanson).

THE POINTE AUX VIEUX ARTIFACTS

The Non-Bead Material

Approximately 22,000 artifacts and ecofacts were excavated from Pointe aux Vieux with an additional 5000 artifacts surface collected from the shoreline in front of the site. Faunal remains dominate the assemblage with over 11,000 mainly fragmentary elements representing more than 50 species (Stewart 2010, 2012, 2013). These included a variety of wild game, such as terrestrial and sea mammals,

birds, and fish, in addition to a variety of domesticated livestock (chickens, cows, pigs, and sheep). The assemblage contains a high volume of mollusks, mostly oysters. The preservation of faunal remains and bone cutlery handles may be explained in part by the presence of shell in the acidic soil.

A high volume of small (2-6 mm diameter) lead shot was recovered, including a cache of several thousand on the beach. Their small size suggests use in a fowler flintlock which would have been effective for hunting birds or fox-sized game. A lead pistol patch, sprue, and several gunflint fragments are further evidence of firearms at the site. A distinctive escutcheon in the form of an owl with the face of the goddess Athena on its chest was found in the cellar feature. A similar item was uncovered at Fort Michilimackinac in northern Michigan and is interpreted to be of English origin (Kristmanson 2015b).

The assemblage includes an array of cutlery, tableware, and glassware imported from Europe. Over 150 fragments of Saintonge coarse earthenware vessels are in the collection. Dating ca. 1700-1800, this ceramic comes from southwestern France and is indicative of French colonial and Acadian sites. Other ceramics include fragments of tin-glazed earthenware (faience), yellow Staffordshire slipware (ca. 1670-1795), a decorated Delftware chamber pot handle, and a grape vine jar (Kristmanson 2015b). Grape vine jars were used to transport live grape vines to North America from Biot in southwestern France, and have been found at Fortress Louisbourg in the context of wealthy residents (Jonah and Vechambre 2012). It is not clear how this luxury item came into the hands of the people at Pointe aux Vieux or how it was used. Other dining materials recovered from the site include stemmed wine glasses, dark-olive wine bottles, and a bone-handled serving fork and knife set.

A range of personal items hint at the individual identities and activities of the people at Pointe aux Vieux. An ornate copper-alloy shoe buckle, buckle chape, two metal buttons, a fragmentary hook and eye closure, and over 150 straight pins are among the clothing-related artifacts. In addition to their use as clothing fasteners, straight pins were also used for lace making and sewing. Historically, they also served as talismans (Beaudry 2006; Longman and Loch 1911). Direct evidence for sewing is in the form of a small copper-alloy thimble, and several lead bale seals attests to the bolts of fabric to which they were once affixed.

Two items from Pointe aux Vieux may be related to personal adornment. The first consists of six small "gooseberry" beads mounted on a straight pin, the pointed end of which has been bent into a loop, apparently so that the object could be suspended (Figure 4). It is unknown whether this item – which is 19.5 mm long – served as an ornament

Figure 4. Six "gooseberry" beads mounted on a straight pin (photo: Claude Arsenault).

or had some other purpose. The second object is a perforated metal disk which may have functioned as a pendant. There is no evidence that the object is a modified coin.

One of the most fragile and rarest artifacts is a small religious pendant or reliquary (Figure 5). The circular object, which measures 19 mm in length and 12 mm in width, has a copper-alloy frame enclosing a textile disc on which is printed IHS between two red dots. This is variously interpreted as a Christogram or abbreviation of the first three letters of the Greek name of Jesus, Iota-Eta-Sigma (ΙΗΣΟΥΣ), or as *Iesus Hominum Salvator*, meaning "Jesus Savior of Mankind."

A large suspension eye is situated at the top of the reliquary with a smaller one at the bottom. A small emerald green glass bead (IIa27) serves as a buffer between the medallion and the lower eye. The pendant may once have been affixed to a rosary. A few bone rosary beads and a

Figure 5. A reliquary incorporating an emerald green bead (photo: Claude Arsenault).

perforated lead cross may be associated with this object and are a reminder of the Acadians' religious faith.

The Bead Collection

A total of 125 whole and fragmentary beads representing 32 varieties (Figure 6) was recovered from the Pointe aux Vieux site. Most of these are conventional glass, of both drawn (n=97) and wound (n=14) construction, but ten of the wound beads are made of proterobas, an igneous rock (a greenish lamprophyre) that melts readily to form an opaque black glass. Another three beads are made of bone. In addition to the 114 beads described below are 11 glass specimens that were either too fragmentary to be classified or not available for study.

The glass beads are classified using the taxonomic system developed by Kenneth E. Kidd and Martha A. Kidd (2012) as expanded by Karklins (2012). Varieties that do not appear in the Kidds' lists are marked by an asterisk (*) followed by a sequential letter for ease of reference. The color names generally correspond to those used by the Kidds. Diaphaneity is described using the terms opaque (op.), translucent (tsl.), and transparent (tsp.). Regarding measurements, D=diameter; L=length.

Drawn Glass Beads

Drawn beads predominate (n=97) and comprise 24 varieties. Tubular beads (n=32) are represented by 16 varieties while circular seed beads (n=65) are of 8 varieties. All the tubular beads are decorated with stripes, primarily spiral, while the seed beads – with the exception of six "gooseberry" beads – are all plain.

Ib*(a). Tubular; op. white; four (?) op. red stripes; n=1. D: 6.4+ mm; L: 7.0+ mm.

Ib*(b). Tubular; op. white; four (?) op. blue stripes; n=1. D: 4.4 mm; L: 7.3 mm.

Ib'*(a). Tubular; op. red; three op. white slightly spiral stripes; n=1. D: 5.4 mm; L: 38.1 mm.

Ib'*(b). Tubular; op. white; four op. red spiral stripes; n=1. D: 40.8 mm; L: 5.8 mm.

Ib'*(c). Tubular; op. white; eight narrow op. red spiral stripes; n=2. D: 20.9 mm; L: 6.1 mm.

Ibb'*(a). Tubular; op. red; indeterminate number of red-on-white spiral stripes; n=2. D: 6.0 mm; L: 11-27 mm.

Ibb'*(b). Tubular; op. white; three (?) op. red/yellow/blue spiral stripes; n=2. D: 6.2+ mm; L: 10.1+ mm.

IIa7. Circular; op. black; n=10. D: 2.9-3.2 mm; L: 1.6-2.1 mm.

IIa14. Circular; op. white; n=22. D: 2.2-3.3 mm; L: 1.7-2.7 mm.

IIa17. Circular; op. light gold; n=1. D: 2.6 mm; L: 1.9 mm.

IIa27. Circular; tsl. emerald green; n=1. D: ca. 2.0 mm; L: ca. 1.0 mm. Part of a religious medallion.

IIa47. Circular; op. shadow blue; n=2. D: 2.5 mm; L: 1.5-1.8 mm.

IIa56. Circular; tsp. bright navy; n=20. D: 2.7-3.7 mm; L: 1.7-2.6 mm.

IIb18. Circular; tsl. light gray "gooseberry" beads with 12 op. white internal stripes; n= 6. D: 3.0 mm; L: 2.0-3.5 mm.

IIIb'*(a). Tubular; op. red outer layer; tsp. green core; four op. white, slightly spiral stripes; cased in clear glass; n=1. D: 7.0+ mm; L: 16.8+ mm. The stripes are ridged, apparently representing glass rods laid side by side on the original glass gather.

IIIbb1. Tubular; op. red outer layer; op. green core; three black-on-white stripes; n=1. D: 7.1 mm; L: 17.9 mm.

IIIbb5. Tubular; op. red outer layer; op. black core; three blue-on-white stripes; n=2 . D: 6.0+ mm; L: 11.8+ mm.

IIIbb'*(a). Tubular; op. red outer layer; op. black core; decorated with three black-on-white slightly spiral stripes; n=3. D: 5.7-6.8 mm; L: 11.8-25.5 mm.

IIIbb'*(b). Tubular; op. red outer layer; tsl. light gray core; three black-on-white slightly spiral stripes; n=3. D: 4.9-5.8 mm; L: 13.5-23.2 mm.

IIIbb'*(c). Tubular; thin op. white outer layer; tsl. light gray core; three blue-on-red spiral stripes; n=8. D: 4.7-6.1 mm; L: 15.1-37.3 mm.

IIIbb'*(d). Tubular; thin op. white outer layer; tsl. light gray core; three spiral compound spiral stripes of which only a red component remains; n=1. D: 4.3 mm; L: 25.6 mm.

IIIbb'*(e). Tubular; thin op. bluish white outer layer; tsl. light gray core; three broad blue/red spiral stripes; n=1. D: 5.6 mm; L: 24.0 mm. The stripes are ridged, apparently representing glass rods laid side by side on the original glass gather.

III[e](a).** Tubular-ribbed; op. red outer layer (12 ribs); tsl. light gray core; three (?) op. white stripes; n=2. D: 3.9-6.5 mm; L: 17.9-20.0 mm.

IVa3. Circular; op. red outer layer; tsp. light gray core; n=3. D: 2.9-3.6 mm; L: 1.8-3.1 mm.

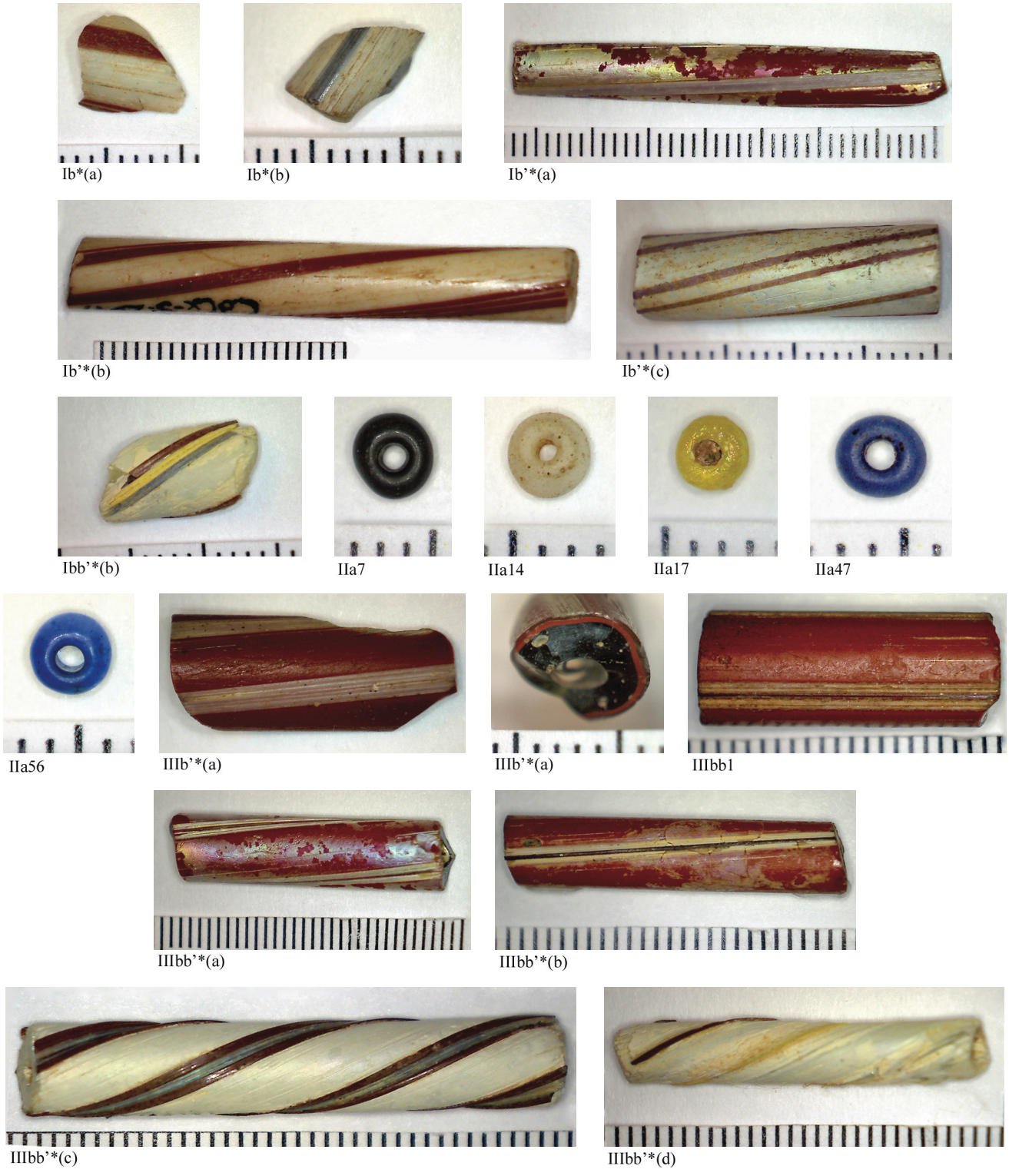

Figure 6. The Pointe aux Vieux bead varieties (not all varieties are illustrated) (photos: Claude Arsenault).

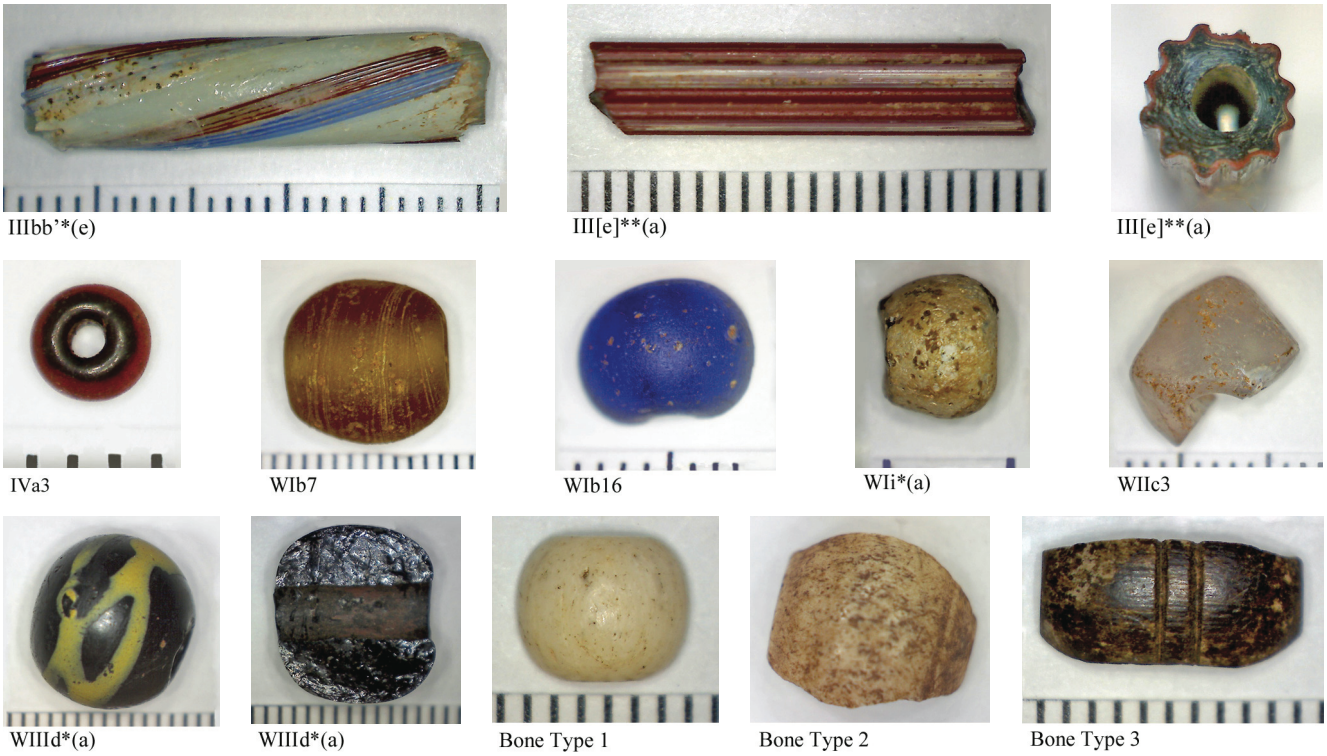

Figure 6, continued. The Pointe aux Vieux bead varieties (photos: Claude Arsenault).

Wound Glass Beads

Wound beads, represented by five varieties, are in a minority (n=14). While it cannot definitely be said of all the beads, the pentagonal-faceted and decorated black beads are furnace wound. The others could have been produced at the lamp.

WIb7. Round; tsl. amber; n=1. D: 9.4 mm; L: 9.6 mm.

WIb16. Round; tsl. bright navy; n=1. D: 7.7 mm; L: 5.8 mm.

WIi*(a). Truncated teardrop; tsl. maple; thick patina; n=1. D: 5.4 mm; L: 4.5 mm. One end appears to be broken.

WIIc3. Pentagonal-faceted; tsl. pale blue with golden cast when held up to the light; n=1. D: 9.2 mm; L: 7.7 mm.

WIIId*(a).[1] Round; op. black; op. yellow meandering lines around the middle; n=10. D: 9.4-11.4 mm; L: 9.3-10.8 mm. One specimen has lost its decoration. Made of proterobas.

Bone Beads

The three bone beads all appear to be lathe turned and most likely represent rosary components.

Type 1. Round; n=1. D: 5.9 mm; L: 5.0.

Type 2. Round; groove around one end; flat ends; n=1. D: 4.5 mm; L: 5.0.

Type 3. Oblong; two medial grooves; flat ends; n=1. D: 4.6 mm; L: 9.6.

ARCHAEOMETRIC ANALYSIS OF SELECT GLASS BEADS

Close examination of the broken surfaces of the fragmentary WIIId*(a) beads revealed that they were rough (Figure 6), unlike the smooth conchoidal fractures exhibited by most glasses. This roughness has also been noted on some broken ball buttons made of proterobas in the Fichtelgebirge region of northeastern Bavaria during the 17th century (Karklins 2014: pers. obs.). Proterobas is an igneous rock, a greenish lamprophyre, that melts readily to form a totally opaque black glass without the need of additives; traditional black glass is either deep purple, green, or blue when held up to a strong light. In that proterobas can be readily identified due to its distinct composition, a sample of the WIIId beads was sent to Adelphine Bonneau at Laval University, Quebec City, for analysis. Also submitted were two proterobas samples recovered from the early-17th-century Wolfslohe glasshouse site near Fichtelberg, Bavaria (Karklins et al. 2016:22-24), and several other Pointe aux Vieux beads for comparison.

Table 1. Semi-Quantitative Analysis (SEM-EDS) of a Sample of Pointe aux Vieux Beads.

Cat. No.	Kidd Code / Color	SiO_2	CaO	Na_2O	K_2O	PbO	MgO	Al_2O_3
Proterobas Waster 1	Black	43.61 ± 2.35	9.44 ± 0.89	2.98 ± 0.23	2.28 ± 0.28	n/a	6.62 ± 0.3	13.58 ± 0.7
Proterobas Waster 2	Black	59.97 ± 0.85	1.76 ± 0.43	5.75 ± 0.64	7.65 ± 0.13	n/a	2.49 ± 0.49	17.43 ± 0.4
1988	WIIId* Black	41.60 ± 2.92	8.24 ± 0.5	2.73 ± 0.32	1.91 ± 0.45	0.33 ± 0.25	5.92 ± 0.37	13.75 ± 0.36
9352	WIIId* Black	47.66 ± 0.99	4.28 ± 0.49	2.17 ± 0.18	9.84 ± 0.14	n/a	6.93 ± 0.07	15.80 ± 0.23
17598	WIIId* Black	47.38 ± 1.68	9.43 ± 0.75	2.97 ± 0.39	1.90 ± 0.1	n/a	6.78 ± 0.21	17.06 ± 0.44
17597	WIIId* Black	37.57 ± 1.32	9.96 ± 0.74	3.11 ± 0.72	2.18 ± 0.12	2.23 ± 0.18	5.77 ± 0.68	11.84 ± 0.79
17617	IIa7 Black	52.30 ± 0.46	11.77 ± 0.75	10.27 ± 0.64	1.83 ± 0.08	n/a	2.56 ± 0.18	5.33 ± 0.27
2048	IIIbb1 Red	63.79 ± 0.42	10.97 ± 0.37	10.66 ± 0.12	1.95 ± 0.04	n/a	3.25 ± 0.20	4.08 ± 0.28
17644	WIIc3 Opal	80.05 ± 1.53	5.84 ± 1.01	1.29 ± 0.19	7.45 ± 1.22	n/a	1.06 ± 0.08	3.45 ± 0.32

The study was conducted in two stages: microscopic observation, and scanning electron microscopy coupled with X-ray energy dispersive spectroscopy (SEM-EDS). LA-ICP-MS analysis would have been the ideal analytical method as many beads have been studied using it including the proterobas products of the Fichtelgebirge workshop in Bavaria (Karklins et al. 2016). Unfortunately, it was not available. X-ray fluorescence was considered but rejected due to its weak capacity to detect and quantify sodium and aluminum which are important elements in glass composition. SEM-EDS was selected for its ease of access at the Lux Laboratory in the Earth and Atmospheric Sciences Department at the University of Quebec in Montreal (UQAM), and because it would provide both images and the chemical composition of the beads without having to sample them. Nine beads representative of the Pointe aux Vieux collection were analyzed. The two proterobas wasters from the Fichtelgebirge workshop were used as references (Table 1).

SEM examination revealed that the drawn glass beads (e.g., IIIbb1) have a honeycomb texture (Figure 7, a), while the WIIId*(a) beads and the two proterobas wasters have a smooth surface texture with small crystals in the form of

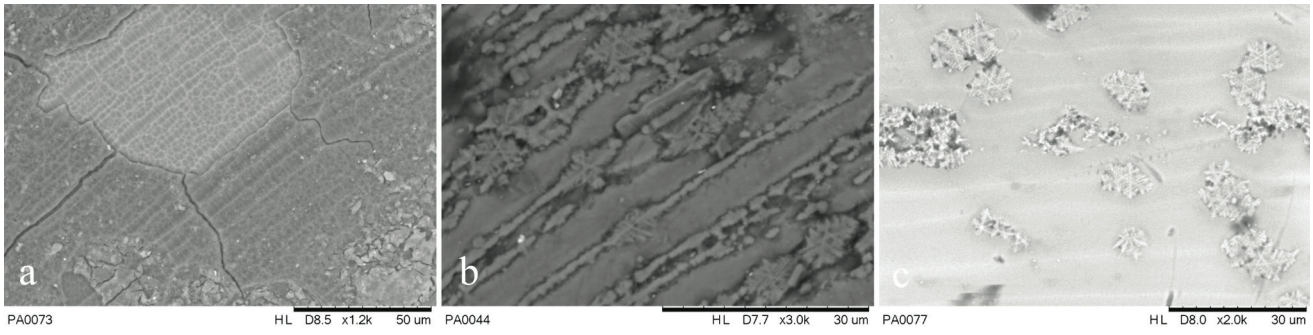

Figure 7. Backscattered SEM images of three specimens: a) honeycomb texture of a glass bead (IIIbb1); b) "snowflake" crystals on a proterobas bead; c) "snowflake" crystals on a proterobas waster (photos: Adelphine Bonneau).

Table 1. Continued.

Cat. No.	Kidd Code / Color	Fe_2O_3	ClO_2	SO_2	MnO	P_2O_3	CuO	TiO_2
Proterobas Waster 1	Black	19.05 ± 2.82	n/a	n/a	n/a	0.12 ± 0.05	n/a	2.32 ± 0.14
Proterobas Waster 2	Black	3.21 ± 0.62	n/a	n/a	n/a	0.22 ± 0.11	n/a	1.51 ± 0.29
1988	WIIId* Black	21.80 ± 4.64	n/a	n/a	n/a	0.49 ± 0.12	n/a	3.23 ± 0.4
9352	WIIId* Black	10.31 ± 0.59	0.16 ± 0.08	n/a	n/a	0.66 ± 0.02	n/a	2.20 ± 0.19
17598	WIIId* Black	11.64 ± 1.24	n/a	n/a	n/a	0.35 ± 0.17	n/a	2.49 ± 0.20
17597	WIIId* Black	23.17 ± 2.26	n/a	n/a	n/a	0.44 ± 0.09	n/a	3.73 ± 0.44
17617	IIa7 Black	3.04 ± 0.19	1.42 ± 0.01	0.16 ± 0.08	10.75 ± 0.67	0.37 ± 0.15	n/a	0.20 ± 0.1
2048	IIIbb1 Red	1.98 ± 0.07	1.17 ± 0.01	0.24 ± 0.12	n/a	0.11 ± 0.05	1.80 ± 0.09	n/a
17644	WIIc3 Opal	n/a	0.87 ± 0.1	n/a	n/a	n/a	n/a	n/a

"snowflakes" (Figure 7, b-c). They resemble similar features called spherulites on obsidians and rhyolites. They are "rounded or spherical masses of one or more acicular minerals that radiate out from a central point" and are "commonly composed of alkali feldspar and quartz polymorphs that are only a few microns in diameter" (Hanson 2020). In that proterobas is an igneous rock, similar crystallization on the surface of the beads is to be expected. Two samples exhibit yellow decoration which is composed of small yellow crystals (Figure 8), and appears to be some kind of paint or glaze rather than glass. The decoration rests on the black glass and can be easily removed by scraping, leaving no trace.

Beads previously analyzed with LA-ICP-MS were used to determine if SEM-EDS semi-quantification results can be directly compared to those obtained using LA-ICP-MS. The results were negative; sodium, magnesium, and calcium were underestimated with SEM-EDS and aluminum and potassium overestimated. This is because SEM-EDS is a surface analysis, whereas LA-ICP-MS makes a microscopic hole in the sample, and obtains readings from the interior (about 100 to 200µm in depth). Even if the glass seems unaltered, ions migrate to its surface and form a layer that has a different chemical composition than the core. We took this phenomenon into account in our interpretation.

In order to determine if the decorated black beads were proterobas, they were compared to the two proterobas wasters and their major and minor compositions match perfectly. Proterobas has a distinct composition: low soda and potash but high concentrations of alumina, lime, magnesia, and iron (Karklins et al. 2016:27). It is very different from that of the drawn black bead (IIa7) which is

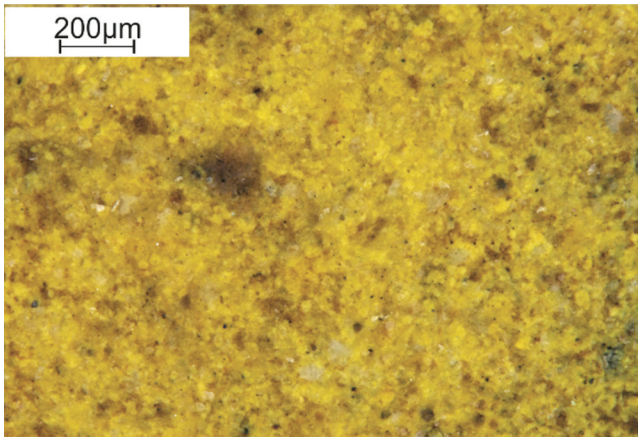

Figure 8. Microscope image of the yellow decoration on the proterobas beads showing its crystalline structure (photo: Adelphine Bonneau).

composed of a soda-lime glass. The yellow decoration is composed of lead and antimony, pointing to the use of the pigment, Naples Yellow ($Pb_2Sb_2O_7$). The exact composition and structure of the yellow material remain undetermined. Further investigation is needed to determine if it is a paint, a glaze, or something else.

Of the other three beads that were analyzed, the pentagonal-faceted specimen (WIIc3) is composed of a high-potash glass, whereas the tubular red bead (IIIbb1) and the black seed bead (IIa7) are soda-lime glass. This suggests two different sources for these beads.

DISCUSSION

Beads of European manufacture have been found at numerous archaeological sites throughout eastern North America, but few beads have been reported from 18th-century Acadian sites in Canada's Maritime Provinces. Two comparable sites from the region are the Belleisle and Melanson settlements in Nova Scotia, each of which was settled in the pre-Deportation era and characterized by similar archaeological features and artifact assemblages that include glass beads. At the Melanson settlement, an unspecified number of spherical glass beads were identified as jewelry to be threaded on a ribbon to form a choker as was the fashion in 18th-century France (Crépeau and Dunn 1986; Dunn 1999). At Belleisle, only two beads were recovered, both glass. The first is a white seed bead found on the surface above a house feature. The second is a blue "raspberry" bead associated with a house feature. The bead has "smooth ends, was presumably tumbled, and is translucent" (Christianson 1984:54).

Considering the dearth of beads elsewhere, the Pointe aux Vieux assemblage provides major insight into what varieties were available to the Acadians during the second quarter of the 18th century. While the diversified nature of the recovered beads hints at possible trade with the local Indigenous population, there is no evidence for this. In fact, excavations conducted at Pitaweikek (Kristmanson 2019) and Nikani-ika'taqank, two nearby sites occupied by the Mi'kmaq between 1728 and 1758, yielded no beads, suggesting that the Pointe aux Vieux beads were not intended for trade.

The Pointe aux Vieux assemblage is dominated by small seed beads, primarily white and blue in color. Tubular beads are less common but quite varied, being represented by 16 varieties, either white or red in color and all decorated with stripes. Not a single monochrome tube is present.

Of special interest are the wound black beads with yellow decoration (WIIId*) as these represent the first proterobas beads to be recorded in North America. While wound "black" beads with the same kind of decoration have been found at numerous sites in the United States and elsewhere (e.g., Brain 1979; Good 1972; van der Sleen 1967), they have all been identified as "glass" and in some cases, they are specifically described as being a translucent burgundy glass when held up to a strong light (e.g., Pluckhahn 1996-1997:52). There is, however, the possibility that some of the beads, especially if truly opaque, are actually proterobas.

The production of proterobas beads was restricted to the Fichtelgebirge region of northeastern Bavaria where an 8-km-long dike of this material cut through the Ochsenkopf, a granite mountain situated between the towns of Bischofsgrün and Fichtelberg (Karklins et al. 2016:16). While glass beads were already being made in the region by 1450, when exactly proterobas began to be used for this purpose remains to be determined. The earliest date recorded so far comes from the archaeological excavations at the Wolfslohe glassworks site which operated on the Ochsenkopf ca. 1640 (Steppuhn 2008). The last mention of proterobas beads in the literature is in 1811 (Schaller 1989). Consequently, archaeologists with these beads in their collections, especially if from well-dated contexts, are encouraged to have them analyzed. If their specimens turn out to be made of proterobas, this will greatly assist in determining their exact temporal range as well as their geographical distribution.

The fragmented pentagonal-faceted bead (WIIc3) is also noteworthy as it may have been produced in the Fichtelgebirge as well, the same form, but in amber glass, having been surface-collected near Bischofsgrün (Karklins et al. 2016:25). If not there, it likely originated in the Bavarian/Bohemian Forest region ca. 150 km to the southeast where an extensive furnace-wound bead industry produced these and other related forms during the 17th to early 19th centuries (Fröhlich 2015; Karklins 2019; Tarcsay and Klimesch 2018). That this bead is composed of high-potash glass further supports a Bavarian or Bohemian origin as it is typical of the *Waldglas* (forest glass) produced in the general region (Karklins 2019:27).

It should be pointed out that these beads, as well as the decorated black beads and other distinctive furnace-wound forms (e.g., raspberry, pigeon egg, five sided), were originally thought to have been produced in Amsterdam, examples having been recovered – along with wasters of drawn bead manufacture – from material dredged from its canals and used to fertilize gardens outside the city during the 17th century (Karklins 1974; van der Sleen 1967).

Subsequent research has revealed no evidence, either archaeological or archival, for the manufacture of wound beads there and it is now clear that Amsterdam only served as a transhipment point for them, along with other glass products of the Fichtelgebirge glasshouses.

Based on the composition of the analyzed tubular beads (soda-lime glass), they were likely made in Venice or another beadmaking center that utilized this type of glass. The bone beads could have originated in any of a number of countries including Germany or Spain (Moreno-García 2010; Spitzers 2013).

CONCLUSION

Overall the artifact assemblage at the Pointe aux Vieux site points to a fairly comfortable life in which the Acadians were well adapted to their environment and connected to an international economy. Among the items are glass, proterobas, and bone beads which originated in several European production centers. How the inhabitants utilized these items is not clear since only seven of them were found in functional contexts: the six "gooseberry" beads mounted on a straight pin which may have served as an ornament, and the emerald green bead that was incorporated into a reliquary. The three bone beads most likely represent rosary components, and the decorated black beads and the pentagonal-faceted example may have served a similar purpose. The small seed beads may have been used in beadwork. How the numerous tubular beads were utilized remains to be determined.

ACKNOWLEDGEMENTS

Thanks are extended to Michel Lamothe, director of the Lux Laboratory at UQAM for access to the SEM-EDS. Claude Arsenault is thanked for helping to catalog and document the bead collection and for bringing to our attention that the decorated black beads are wound, not drawn.

ENDNOTE

1. The wound, "opaque" black beads with yellow or white meandering lines are generally assigned to the WIIIb group in that the decorative elements are glass and marvered into the surface to some degree. In the case of the proterobas examples, the decoration is a paint or glaze that rests on the surface and can be easily scraped off. They therefore belong in the WIIId group.

REFERENCES CITED

Arsenault, Georges
2009 The Malpeque Bay Acadian: 1728-1758. *The Island Magazine*, Fall/Winter 66:2-9.

Beaudry, Mary C.
2006 *Findings: The Material Culture of Needlework and Sewing*. Yale University Press, New Haven.

Brain, Jeffrey P.
1979 *Tunica Treasure*. Harvard University, Papers of the Peabody Museum of Archaeology and Ethnology 71.

Buchanan, Scott
2001 Interim Report and Recommendations: Archaeological Investigation, Gillis Point, Malpeque Bay. Report to Indigenous Relations Secretariat, Government of Prince Edward Island, Charlottetown.

Christianson, David
1984 *Belleisle 1983: Excavations at a Pre-Expulsion Acadian Site*. Nova Scotia Museum Curatorial Report 48.

Crépeau, Andree and B. Dunn
1986 The Melanson Settlement: An Acadian Farming Community (ca. 1664-1755). Parks Canada, *Research Bulletin* 250.

Dunn, Brenda
1999 Aspects of the Lives of Acadian Women in Ancienne Acadie. In *Looking into Acadie: Three Illustrated Studies*, edited by Margaret Conrad, pp. 29-52. Nova Scotia Museum, Halifax.

Faucher, Ann Marie
2012 Seed Macro-Remains from Pointe aux Vieux Archaeological Site, Prince Edward Island. Report to Indigenous Relations Secretariat, Government of Prince Edward Island, Charlottetown.

Fröhlich, Jiří
2015 Šumavské páteříkové hutě [Rosary Bead Furnaces of the Šumava]. *Archeologie ve středních Čechách* 19:431-438.

Gendron, Jason
2008 Geophysical Survey of the Pointe aux Vieux Site, Port Hill, PEI. Report to Indigenous Relations Secretariat, Government of Prince Edward Island, Charlottetown.

Gesner, A.
1847 Report on the Geological Survey of Prince Edward Island, 1846. *Journal of the House Assembly of Prince Edward Island*, Appendix D, pp. 11.

Good, Mary Elizabeth
1972 *Guebert Site: An 18th Century, Historic Kaskaskia Indian Village in Randolph County, Illinois*. Central States Archaeological Societies, Memoir 2.

Hale, Robert
1731 Journal of a Voyage to Nova Scotia Made in 1731 by Robert Hale of Beverly. Original manuscript. American Antiquarian Society, Worcester, MA.

Hanson, S.L.
2020 Word to the Wise: Spherulites and Lithophysae. *Rocks & Minerals* 95:183-187.

L'Impartial
1893 Une Reminiscence Acadienne. 17 August. Tignish, PE.

Jonah, A.M.L. and C. Vechambre
2012 *French Taste in Atlantic Canada, 1604-1758. A Gastronomic History*. Cape Breton University Press, Sydney, NS.

Karklins, Karlis
1974 Seventeenth Century Dutch Beads. *Historical Archaeology* 8:64-82.
2012 Guide to the Description and Classification of Glass Beads Found in the Americas. *Beads: Journal of the Society of Bead Researchers* 24:62-90.
2019 Furnace-Wound Beadmaking in the Bavarian/Bohemian Forests and Environs, 15th-19th Centuries. *The Bead Forum* 74:1-3.

Karklins, Karlis, Sibylle Jargstorf, Gerhard Zeh, and Laure Dussubieux
2016 The Fichtelgebirge Bead and Button Industry of Bavaria. *Beads: Journal of the Society of Bead Researchers* 28:16-37.

Kidd, Kenneth E. and Martha Ann Kidd
2012 A Classification System for Glass Beads for the Use of Field Archaeologists. *Beads: Journal of the Society of Bead Researchers* 24:39-61.

Kristmanson, Helen
2008 Permit Report: Malpeque Bay Archaeological Project, August 18-22, 2008. Report to Indigenous Relations Secretariat, Government of Prince Edward Island, Charlottetown.
2009 Archaeology at Pointe aux Vieux. *The Island Magazine*, Fall/Winter 66:10.
2015a Archaeology at Pointe aux Vieux. *The Island Magazine*, Spring/Summer 77:22-38.
2015b Archaeology at Pointe aux Vieux Part Two. *The Island Magazine*, Fall/Winter 78:21-39.
2019 Pitawelkek: A 2000 Year Old Archaeological Site in Malpeque Bay. *The Island Magazine*, Fall/Winter 88:2-14.

La Roque, Sieur de
1906 Tour of Inspection Made by the Sieur de la Roque. Census. 1752. In *Report Concerning Canadian Archives for the Year 1905*, Vol. II, Appendix A. Ottawa.

Lockerby, Earl
1999 Deportation of the Acadians from Ile St.-Jean, 1758. *The Island Magazine*, Fall/Winter 46:17-25.
2003 Threats and Indulgences: Ile-Saint-Jean in 1745-1747. *The Island Magazine*, Fall/Winter 54:2-10.

Longman, G. and S. Loch
1911 *Pins and Pincushions*. Longmans, Green, London.

MacDonald, Captain J.
1795 DeBarres Papers C-1455, Series 2 (M.G. 23, F1-2), Image 714. Tatamagouche and Minudie Estates. Library and Archives Canada, Ottawa. https://heritage.canadiana.ca/view/oocihm.lac_reel_c1455/714?r=0&s=1https://heritage.canadiana.ca/view/oocihm.lac_reel_c1455/714?r=0&s=1, accessed 1 December 2020.

Moreno-García, Marta, Carlos M. Pimenta, Ana Pajuelo Pando, and Pedro M. López Aldana
2010 Archaeological Evidence of Pre-Industrial Worked Bone Activity in 18th Century Seville, Spain. In *Ancient and Modern Bone Artefacts from America to Russia*, edited by Alexandra Legrand-Pineau et al., pp. 183-190. BAR International Series 2136.

Pluckhahn, Thomas J.
1996-1997 Beads, Pendants and Buttons from Early Historic Creek Contexts at the Tarver Sites, Georgia. *Beads: Journal of the Society of Bead Researchers* 8-9:45-65.

Schaller, Christoph
1989 Johann Heinrich Scherbers Umsichten auf dem Ochsenkopf aus dem Jahre 1811. *Das Fichtelgebirge* 2.

van der Sleen, W.G.N.
1967 *A Handbook on Beads*. Musée du Verre, Liège.

Spitzers, Thomas A.
2013 Die Konstanzer Paternosterleisten: Analyse zur Technik und Wirtschaft im spätmittelalterlichen Handwerk der Knochenperlenbohrer. *Fundberichte aus Baden-Württemberg* 33:661-940

Steppuhn, Peter

2008 Eine Hütte der Zeit um 1640 im Fichtelgebirge zur Herstellung von Knöpfen aus Proterobas und Glas. In *Glashüttenlandschaft Europa. Beiträge zum 3. Glassymposium in Heigenbrücken/Spessart*, edited by Helmut Flachenecker, Gerrit Himmelsbach, and Peter Steppuhn, pp. 105-108. Schnell & Steiner, Regensburg.

Stewart, F.L.

2010 Zooarchaeological Remains from the Pointe aux Vieux site (CdCx-5), PEI. Report to Indigenous Relations Secretariat, Government of Prince Edward Island, Charlottetown.

2012 Zooarchaeological Remains Excavated in 2010 from the Acadian Pointe aux Vieux Site (CdCx-5), PEI. Report to Indigenous Relations Secretariat, Government of Prince Edward Island, Charlottetown.

2013 Zooarchaeological Remains Excavated in 2011 from the Pointe aux Vieux Site (CdCx-5), PEI. Report to Indigenous Relations Secretariat, Government of Prince Edward Island, Charlottetown.

Tarcsay, Kinga and Wolfgang Klimesch

2018 A Glass-Beadmaking Furnace at Schwarzenberg in the Bohemian Forest, Upper Austria. Translated by Karlis Karklins. *The Bead Forum* 73:1-4.

Wintemberg, William J.

1914 Archaeological Work on the Atlantic Coast, 1913. In *Summary Report of the Geological Survey of Canada, Department of Mines for the Calendrical Year of 1913, Anthropological Division, Sessional Paper* 26:385-386. Ottawa.

Helen Kristmanson
Director, Aboriginal Affairs and Archaeology
Indigenous Relations Secretariat
Government of Prince Edward Island
Charlottetown, PE
hekristmanson@gov.pe.ca

Erin Montgomery
Archaeologist
Indigenous Relations Secretariat
Government of Prince Edward Island
Charlottetown, PE
emmontgomery@gov.pe.ca

Karlis Karklins
Independent Researcher
Ottawa, ON
karlis4444@gmail.com

Adelphine Bonneau
Postdoctoral Fellow
Archaeology Laboratories
Laval University
Quebec City, PQ
adelphine.bonneau@gmail.com