

Archaeological essays in honor of Irving B. Rouse

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Trade beads and sunken ships

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In eastern North America chronological scales or sequences of trade beads (*cf.* Pratt 1961; Quimby 1966) have been useful in the dating of undocumented or poorly documented archaeological deposits of the period of contact between Indians and non-Indian invaders. A current problem in the historical archaeology of the Northwest Coast of North America is the lack of such a chronological scale based on changing styles of glass beads.

The construction of a chronology of glass bead types is based on a combination of historical and archaeological evidence. The historical evidence consists of such things as journals, logs and invoices of traders; records of bead manufacturers; dated pictures painted in such detail that bead types can be identified; and beadwork artifacts collected by traders and explorers in a known place at a known time. The archaeological evidence consists of beads and/or beaded artifacts from sites and loci that can be placed in relative chronological order by means of stratigraphy; beads and/or beaded artifacts that are found in sites of known time spans, e.g., A.D. 1610-1640; and beads found in the cargoes of wrecked ships or canoes of fur trading companies. The sunken ship is an especially fine example of encapsulated time. Every artifact in an undisturbed shipwreck was there before the ship sank and cannot be later than the time of the sinking of the ship.

With sufficient data from historical and archaeological sources it should be relatively easy to formulate a trade bead chronology that would be useful in the dating of historic sites in the Northwest Coast culture area. If, however, the same types of beads were used throughout all or most of the contact period, then the construction of a useful bead chronology would not be feasible.

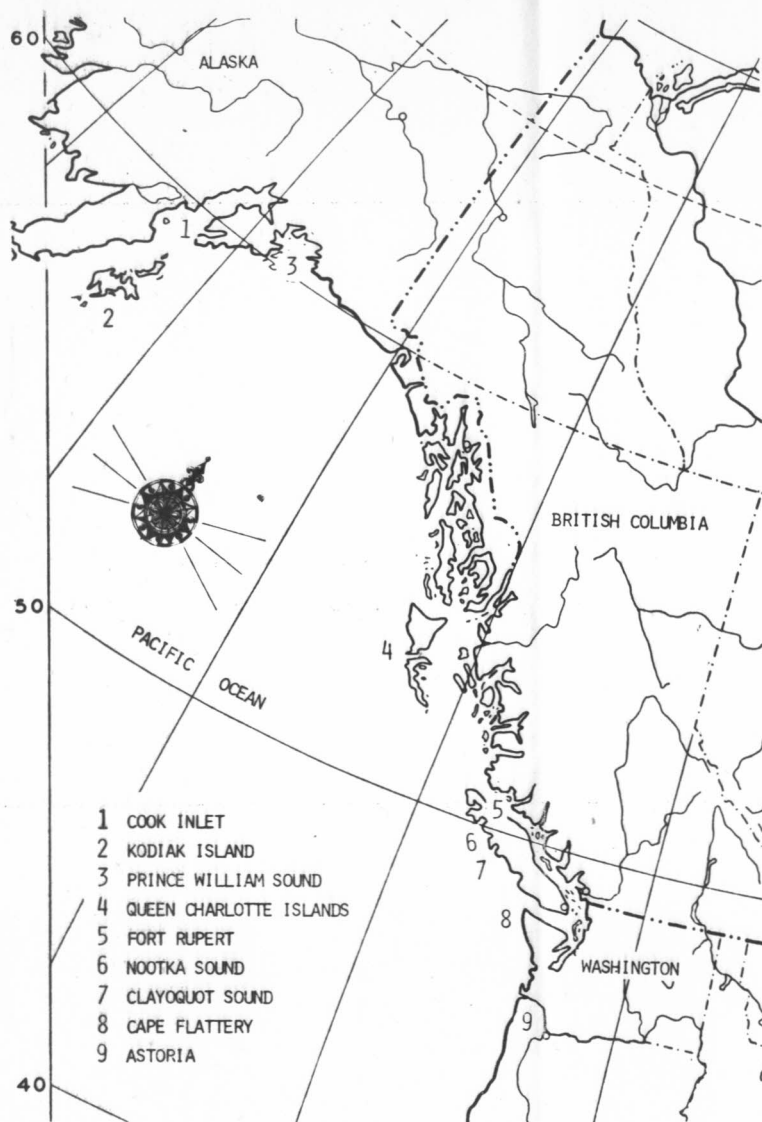


Figure 1. *Locations mentioned in text*

The problem is somewhat complicated by the beginning dates and duration of the contact period as well as the nature of the contact. Whereas in eastern North America the contact period began in the latter fifteenth century and lasted for more than 300 years, on the Northwest Coast the contact period began in the second half of

the eighteenth century and lasted about 100 years. Moreover, many European nations of differing national cultures established permanent or semi-permanent settlements and trading establishments in eastern North America. But on the Northwest Coast the maritime fur traders and the somewhat later overland fur traders seem to have represented a pan-fur trade culture despite the differences in their European or eastern North American white cultures. In brief, the fur traders of the Northwest were after furs and profits, and any settlement of the region was for the purpose of furthering the aims of the fur trade. Only in the latter part of the contact period did other motives for settlement by non-Indians occur.

The ubiquitous trade bead of the Northwest Coast is a large, multifaceted bead of light or dark blue color. It is a tube bead made either from a single monochrome gathering of glass (Kidd and Kidd 1970: 51, type If) or from a multilayered gathering (Kidd and Kidd 1970: 51, type IIIf). These beads and large round or oval beads of dark blue colors belong to a class popularly known in the region as Hudson's Bay beads or Russian beads. But just when these kinds of beads were first brought to the Northwest Coast is uncertain.

It was Captain James Cook's third voyage (1776-1780), an account of which was published in 1784, that brought the maritime fur traders to the Northwest Coast. On Cook's previous voyages in the Pacific (1768-1775), his ships carried glass trade beads, but they never were described. There is, however, some useful information from the records of Cook's third voyage. The expedition reached Nootka Sound on Vancouver Island in March of 1778. Cook's officers were alerted especially to look for evidence of commerce with civilized nations, and, except for two silver spoons presumably from the earlier Spanish contacts, there was none. The Indians of Nootka Sound did not possess glass beads in 1778. In fact, they didn't even like glass beads. Cook's journal records of them: 'Beads they were not fond of and cloth of all kinds they rejected' (Beaglehole 1967:III, 297). The journal reiterates this statement later: '... beads and such things of which I had yet some left, were in little esteem' (Beaglehole 1967:III, 302).

Just what kinds of beads were being used in trade by Captain Cook's ships and Russian traders as well is found in the records of events far north of Nootka Sound. In May of 1778 in the vicinity of Prince William Sound, Alaska, Cook's journal records that a native, '...

cloathed in a dress made of Sea beaver skin and on his head such a Cap as is worn by the people of King George's Sound, Ornamented with sky blue glass beads about the size of a large pea, these he seemed to set ten times more Value upon than our white glass beads which they probably thought was only crystal which they have among them. They, however, essteemed [*sic*] beads of all sorts and gave whatever they had in exchange for them, even their fine Sea beaver skins' (Beaglehole 1967:III, 346). Thus Captain Cook's ships are carrying white glass beads of unstated size and shape, and the Russians who had a monopoly on the fur trade north of the Northwest Coast were using sky blue glass beads about the size of a large pea and presumably round. There is some additional information about these beads from the pen of Captain James King who was responsible for the third volume of Cook's third voyage. He wrote of the natives of Prince William Sound (Beaglehole 1967:III, 1418) as follows: '...but the most certain proofs of their having a frequent supply of articles belonging to civiliz'd Nations are their blue beads; these of which they set a very great Value, have not the good shape of English beads but are manufactur'd by some Nation rudder in this art than ourselves, they are a bead about the size of a large currant berry, & intended to be (but are not) round'.

The same or similar beads were seen elsewhere by Cook's men in other parts of Alaska dominated by the Russian fur trade. For instance, Cook's Journal notes of the natives seen at Latitude 60° 37' North: 'They were in possession of iron and a few sky blue glass beads such as have been before mentioned. These they seemed to value very much and I had some difficulty to purchas [*sic*] two or three to satisfy my self whether they were glass or made of some substance they might have amongst themselves' (Beaglehole 1967:III, 365).

In September of 1778 in the vicinity of Cape Denbigh, Alaska, Captain Cook's journal records: '...they had in their possession some such glass beads as I have before noticed' (Beaglehole 1967:III, 438). Thus, it seems in 1778 as if all of the fur traders of Russian America were using roundish beads of sky blue glass the size of a large pea or currant berry.

Beads were carried on the very first Russian voyages to North America; the journal of Georg Wilhelm Steller records that on September 4, 1741, Bering's expedition made a gift of 'two Chinese tobacco pipes and some glass beads' to an Aleut (Golder 1925: vol. 2,

p. 92). Unfortunately, there is no description of the beads. In any event it seems clear that in 1778 glass beads were being introduced to the southern Northwest Coast Indians and that the native peoples of Russian America to the northward already possessed and were fond of small round glass beads of sky blue. The total inventory of trade beads used by the Russians was summarized by Captain James King in speaking of the Aleuts in July of 1778. He wrote: 'The women... were very fond of beads; But preferd [*sic*] those colours & sizes that came nearest to what they had from the Russians, such as blue, white & brown about the size of a large pea' (Beaglehole 1967:III, 1427).

These Russian beads are certainly not of the types later and even now known as Russian or Hudson's Bay beads. Thus, the Russian and Hudson's Bay bead types must have been introduced some time after 1778. However, at this point in the discussion, it seems fruitful to introduce another type of glass bead that was carried on Cook's third voyage. In China in December of 1779 Captain James King who wrote the third volume of Cook's last voyage, recorded that '...six of the finest skins purchased by us, [in North America] were got for a dozen large green glass beads' (King 1784:438). This transaction took place in Prince William Sound in 1778 at which time Capt. King recorded, '...beads were the best & principal article in our trade, & a green bead of an oval figure as big as a small plumb, which one of our Gentlemen got from an Otaheite [Tahiti] man that had receiv'd them from the Spainyards [*sic*] was so eagerly seiz'd that the Chief sold 8 or 10 sea Otter skins... for double the number of beads' (Beaglehole 1967: III, 1418).

After Captain Cook's explorations became known, the maritime fur traders came to the Northwest Coast in increasing numbers. In 1785 there was one vessel, in 1786 there were nine vessels, in 1789 there were fourteen vessels, and in 1792 there were thirty vessels (Quimby 1948: 247). All of these traders were familiar with Cook's voyage and the information about glass beads; consequently, they carried with them the recommended glass beads of blue and green. For instance, blue and green beads were traded at Cook Inlet, Alaska, in 1786 by Captain George Dixon (1789:62). In the same year Captain John Meares traded 'green glass beads' (Meares 1791:I, LXV) on the Northwest Coast. At Nootka where Meares in May of 1788 had an establishment on shore he recorded: 'When the bell rung for our people to leave off work in the

evening, the native labourers were always assembled to receive their daily pay, which was distributed in certain proportions of beads or iron' (Meares 1791:1, 183). Captain Robert Gray's second voyage (1790-1793) in the ship *Columbia* records some useful information about beads. John Boit, the 17-year-old 5th mate on the *Columbia*, reported at Tatooch (in Washington State) on June 28, 1791, they obtained 'five Halibut and Salmon for Nails and Beads' (Howay 1941: 371). John Hoskins, clerk of the *Columbia* in July of 1791 then in the Queen Charlotte Islands wrote of women and their beads as follows: 'The ornaments most common are beads of various sorts, particularly the blue glass bead, of which they appear to be fond; buttons, shells, etca. etca. which they wear in large bunches round their necks' (Howay 1941:205).

Thus, by the 1790s, there is some evidence that blue glass beads are the preferred type in the Northwest Coast fur trade. There is, however, no indication that the multifaceted bead of light blue or dark blue color, variations of which have been called Russian or Hudson's Bay beads, has yet been used by the maritime fur traders.

It was probably in the early 1800s that the kinds of blue beads known as Russian or Hudson's Bay beads were introduced into the Northwest Coast fur trade, and it is likely but not now demonstrable that the North West Company and its contemporaries had been using these beads in midwestern North America before the time of their introduction into the Pacific Northwest. And since it seems that all nations of fur traders were getting their beads from the same sources, the terms Russian and Hudson's Bay are not of much use.

For instance the 'Barter Account' of John Jacob Astor's ship *Beaver* (Porter 1931:1, 521) records that on October 3, 1812, Alexander Baron-off Esqr. received '253 Gallons Gin' worth \$182.16 in exchange for '290 lbs. small blue beads, 137 lbs. Mixed Blue and White Beads, 52 lbs. Dark Blue Large Beads, 116 lbs. Light Blue Large Beads' which were worth \$182.16.

Aleksandr Andreyevich Baranov was head of the Russian American Company in Alaska at the time he traded beads for gin with Astor's agents. John Jacob Astor was a well-established New York merchant and owner of the Pacific Fur Company, the Southwest Company and the American Fur Company.

Apparently, the ship *Beaver* needed more beads than were received

from Governor Baranov. On December 24, 1812, according to the vessel's barter account (Porter 1931:1, 522) the *Beaver* traded '2 kegs [Gun] Powder worth \$32.00 to the Brig *Lydia* Capt. Bennett for 44 lbs. Small Blue Beads @ 64/100' and for 'Gurrahs', a kind of cloth.

Trade beads for Northwest America were also obtained in China. In a letter to Astor dated January 24, 1811, Canton, Capt. John Ebbets wrote, '...the Merchants are now counting our Furs – and it requires every moment of my time in attending them and collection [*sic*] articles for N.W. America. The Beads that answer Columbia's River are plenty here. I shall purchase some for the *Tonquin*' (Porter 1931:1, 461). On July 29, 1811, Astor's ship *Beaver* returned to New York from China with 'teas, silks, nankeens, chinaware, nutmegs, cloves, cassia, vermillion, chair bottoms, and beads' (Porter 1931:1, 153).

Beads were also purchased in England for trade on the Northwest Coast. A letter from John Jacob Astor to Churchill C. Cambreleng dated June 21, 1813, contains some relevant information. Astor wrote (Porter 1931:1, 539), 'and if you go from England take out with you about 300 pair 2½ point Blankets, 300 – 2 point, 100 – 1½ point, some 50 to 60 thimbels, gimblets, some fils [files], common knives and scissors – Buttons and blue point Beads – all of which are very good for the Coast, also some common Linnen and indian Callicos of high color – the investment not to be very large – some Windsor Glass – and 100 northwest Guns, cost about 30/-500 lbs. Powder and some Goos [goose] and Buckshot'.

Astor purchased glass beads in central Europe. The evidence for this is a New York advertisement of November 8, 1814, for the cargo of the Astor ship *Hannibal* (Porter 1931:1, 306–307). The glass in this advertisement consisted of 70 cases assorted Bohemian ware, decanters, tumblers and wine glasses, twelve cases each 1500 half pink tumblers, Westphalian glass, ten cases each 800 pink tumblers, Westphalian glass, five cases pint and half-pint cut glass tumblers, Bohemian glass, four cases elegant cut glass lamps and milk glass lamps, three cases assorted Bohemian glassware, cut and figured, three cases elegant cut glassware for table sets, double flint, one case assorted beads, one case glass animals, birds and fishes for children. Presumably the case of assorted glass beads came from Bohemia. Whether or not these beads were of a class used in the fur trade, the source of the beads was known to Astor's buyers and such a source probably produced trade beads. This was

certainly the case with the Venetian glass workers of Murano from at least the beginning of the seventeenth century into the first quarter of the twentieth century.

From the early seventeenth century trade beads were made also in Holland. In fact identical beads were made in Holland and in Venice, the only difference being in the composition of the glass which can be detected by chemical analysis but not by visual inspection (Van Der Sleen 1963).

The American ship *Boston* owned by Francis and Thomas Amory of Boston, Massachusetts, was prepared for a trading voyage to the Northwest Coast at Hull, England, in the summer of 1802. The glass beads to be used in the fur trade came from Holland. The cargo of the *Boston* (Jewitt 1815:14) consisted of 'English cloths, Dutch blankets, looking glasses, beads, knives, razors, etc. which were received from Holland, some sugar and molasses, about twenty hogsheads of rum, including stores for the ship, a great quantity of ammunition, cutlasses, pistols, and three thousand muskets and fowling pieces'.

Fur trader, Gabriel Franchere, speaking of the Indian women and beads on the Lower Columbia River in the period of 1811-1814 wrote (1854:244): 'Their ornaments consist of bracelets of brass, which they wear indifferently on the wrists and ankles; of strings of beads of different colors (they give a preference to the blue), and displayed in great confusion around the neck, and on the arms and legs; and of white shells, called *Haiqua*, [Dentalium], which are their ordinary circulating medium.' Certainly great numbers of the beads seen by Franchere were traded to the Indians by Astor's fur company which it should be recalled obtained beads from Russian America as well as from Europe.

The same kinds of beads that are now popularly known as Russian beads are also popularly known as Hudson's Bay beads in the Pacific Northwest. These multifaceted beads of light or dark blue color in several sizes and round or oval beads of similar color and sizes seem to have been stocked by the Hudson's Bay Company on Vancouver Island in the last half of the nineteenth century.

The evidence for this is as follows: In 1883 the Hudson's Bay Company sold its trading post and stock of goods to Robert Hunt, an Englishman who had worked for the company (cf. Johnson 1972:14). Mr. Hunt had married the daughter of a Tongas (Tlingit) chief. With

his wife and children he occupied the former Hudson Bay Company house and ran the store. One of his sons was the famous George Hunt who supplied anthropologist Franz Boas with the bulk of the material he published concerning the Kwakiutl Indians of Fort Rupert and vicinity. The store, run by descendants of Robert Hunt, continued in operation until 1968 after which time some of the former stock of the old store was sold to some collectors and dealers. Among the things sold were allegedly some old multifaceted Hudson's Bay beads (Holm 1973).

All of the types of Russian or Hudson's Bay beads mentioned above were available in quantity from a European bead company with bead outlets in Amsterdam, Hamburg and Murano as late as the first quarter of the twentieth century. I have seen (courtesy of Kenneth Kidd) a copy of this company's catalog dated in the 1920s in which the Russian or Hudson's Bay beads currently offered for sale were illustrated in color.

Were these beads stocked by the Hudson's Bay Company from the time of its beginning operations in the Northwest in 1821? In that year the Hudson's Bay Company had acquired by merger the trading posts and personnel of the North West Company, heretofore their chief rivals. It should also be noted that during the War of 1812 the North West Company had, by duress, purchased the holdings and hired some of the employees of Astor's Pacific Fur Company. Were these companies and the Russian American Company all using the so-called Russian or Hudson's Bay beads in their trading ventures in the Northwest? Probably they were.

There is some evidence that the Russians were using multifaceted beads of blue glass at some time around 1810. This evidence is as follows: In the collections of the Museum of Anthropology and Ethnography, Leningrad, U.S.S.R., there is an Aleut Hunting Hat of wood with painted designs, ivory ornaments, sea lion whiskers, feathers and trade beads of glass (Collins *et al.* 1973:50). This hat was collected in the Aleutian Islands or Kodiak Island by Andrei Khlebnikov, circa 1810. On November 10, 1973, I examined this specimen on temporary exhibit at the Portland Art Museum, Oregon. Centered in the middle of the front of the hat there were three blue trade beads of translucent glass. These were elliptical or egg-shaped and multifaceted with sharply cut facets. They are about 1.5 to 2 cm long and have small hole diameters. If Kidd and Kidd's bead types IIa 54 or IIa 42 (1970:56)

were faceted, they would approximate the three beads on the Aleut hunting hat.

That this artifact was collected ca. 1810 is a most important piece of information. I would interpret this to mean that the hunting hat could have been collected at any time between 1805 and 1815. Assuming that the beads were attached to the hat when it was collected, the beads should date from a time not later than 1815.

Thus, multifaceted blue beads were being traded by the Russians ca. 1810 and were being traded by the Hudson's Bay Company in the latter part of the nineteenth century and probably even later. It seems that there were different types of multifaceted beads and other bead shapes. But the specific types and the order of their introduction into Russian America and the Pacific Northwest is not yet well enough known. The historical and ethnological evidence is not sufficient. The archaeological evidence is imprecise and lacks the kind of time capsules in which beads might be associated. Answers might be found by underwater examination of the hulls and bottoms of sunken ships that belonged to the trading companies.

A good example of such a ship is the *Tonquin*, the remains of which lie beneath the waters of Clayoquot Sound probably in the vicinity of Village Island a few miles from Tofino, Vancouver Island, Canada.

The ship *Tonquin* of Boston was owned by John Jacob Astor. Under the command of Jonathan Thorn, the *Tonquin*, on June 5, 1811, sailed from the Columbia River northward on a trading venture to Vancouver Island. The ship carried its regular crew plus an Indian interpreter (Swan 1857:225). The next news of the *Tonquin* is found in the journal of Stephen Reynolds, a foremast hand on the brig *New Hazard*, 281 tons, of Salem, Massachusetts. In the summer of 1811 while the *New Hazard* was at Nahwhitti on northwestern Vancouver Island, Reynolds made the following entry in his journal (Howay, ed. 1938:33): 'Monday, 15 July. At six came to anchor in New-Etta. The Indians told us there was a ship taken at Nootka, and was [Captain] Blanchard. Overhauled bales to see how much the rats had eaten; stowed back again. Stinking fish for dinner.'

Although it is not correct, Reynolds' notation is the earliest mention of the destruction of the *Tonquin* that I have been able to find. However, a longer entry on August 31, 1811, correctly identifies the lost ship and the proper locality. Reynolds (Howay, ed. 1938:42) wrote as

follows: 'The ship which we were told was Blanchard at New-Etta proved to be the *Tonquin*, Captain Thorn. A large number of Indians came on board; he desired them to go away; they would not; he used some authority to get them off, when they attacked him; finding it in vain to regain his ship, the captain with one other ran and set fire to the magazine, which blew her stern out and she went down stern first. About one hundred Indians were killed, blown up, and sunk. One of the boats was on shore with six men, who, finding they had no refuge from the Indians, set out for Columbia River, it is supposed, but going ashore at Classet [Cape Flattery] were shot by the natives. The place where this melancholy event happened was Wickanenashees [Clayoquot Sound].'

Another account of the loss of the *Tonquin* appeared in a letter written by Captain John Ebbets of Astor's ship *Enterprise*. It was Captain Ebbets who in January of 1811 wrote to Astor that he was planning to purchase glass beads in China for use by the *Tonquin*. Ebbets' letter was received at Astoria on the Columbia River, May 5, 1812. The information in it as summarized by James G. Swan (1857: 226-227) is as follows: 'The *Tonquin*, it appears, anchored in the middle of June, 1811 opposite a village on the Bay of Clyoquot [Clayoquot Sound] near the Straits of Fuca. Captain Thorne [Thorn], who is represented to have been totally unfitted to trade with the Indians, had given a mortal affront to one of the chiefs by slapping him in the face with an otter-skin he was offering for sale. The Indian seized the opportunity when the men were busily engaged about their duties on board the ship to get possession of her, and put to death every one of the crew and passengers except the [Indian] interpreter, the clerk, Mr. Lewis, and five or six sailors. The interpreter was saved by leaping into a canoe where there were some women, who concealed him. Four of the men managed to leave in the [ship's] boat during the night, but were taken by the savages and murdered in the most cruel manner. The following day while the ship was crowded with Indians, she was blown up by Mr. Lewis, as was supposed, killing by the explosion a great number of savages.'

According to Stephen Reynolds of the *New Hazard* the *Tonquin* sank stern first after the explosion which blew out the stern. There is a strong possibility that much of the ship is preserved in the cold waters of Clayoquot Sound. Trade goods and especially beads of glass should

be found on the wreck, and probably the beads would be of the types called Russian or Hudson's Bay Beads.

Another example of a wreck in protected waters is that of the *Boston* lost in Nootka Sound, Vancouver Island, in 1803. The trading cargo of the *Boston*, much of it obtained from Holland, included glass beads. Information concerning this ship is in the writings of John R. Jewitt (1815) who was the only survivor of 27 men.

The ship *Boston*, named for her port of registry in Massachusetts, was under the command of Captain John Salter. She was repaired and outfitted at Hull and departed from England on September 3, 1802. Via Cape Horn the *Boston* arrived at Nootka Sound on March 12, 1803. According to Jewitt the *Boston* continued to sail to a place about five miles to the northward of the Nootka Indian village on Friendly Cove and came to anchor 'in twelve fathom water, muddy bottom... on the western side of an inlet or small bay at about half a mile from the coast near a small island which protected it from the sea' (Jewitt 1815:20). This anchorage was 'so near the shore', wrote Jewitt (1815:20) 'that to prevent the ship from winding we secured her by a hauser to the trees'. It was at this anchorage on March 22, 1803, that the *Boston* was captured by Nootka Indians, and all but two of the ship's crew were put to death. The Nootka chief, Maquina, spared the life of John Jewitt because of his skill as an armorer and blacksmith. Jewitt then became Maquina's slave. Of this event Jewitt (1815:29) wrote: 'Maquina... led me to the quarter deck, where the most horrid sight presented itself that ever my eyes witnessed - the heads of our unfortunate Captain and his crew, to the number of twenty-five, were all arranged in a line, and Maquina ordering one of his people to bring a head, asked me whose it was: I answered the Captain's; in like manner the others were showed me, and I told him the names, excepting a few that were so horribly mangled that I was not able to recognize them.'

Continuing his narrative, Jewitt (1815:30) said: 'Maquina then ordered me to get the ship under weigh for Friendly Cove [site of the Nootka village]. This I did by cutting the cables and sending some of the natives aloft to loose the sails, which they performed in a very bungling manner. But they succeeded so far in loosing the jib and topsails, that with the advantage of a fair wind, I succeeded in getting the ship into the cove, where, by order of the King, I ran her ashore on a sandy beach, at 8 o'clock at night.'

'On the 24th and 25th', wrote Jewitt (1815:34), 'the natives were busily employed in taking the cargo out of the ship, stripping her of her sails and rigging, cutting away the spars and masts, and in short rendering her as complete a wreck as possible; the muskets, ammunition, cloth and all the principal articles taken from her, being deposited in the king's house.'

'Early on the morning of the 18th [April, 1803] the ship was discovered to be on fire' (Jewitt 1815:40). This was owing to one of the savages having gone on board with a fire brand at night for the purpose of plunder, some sparks from which fell into the hold, and communicating with some combustibles soon enveloped the whole in flames. The natives regretted the loss of the ship the more as a great part of her cargo still remained on board.'

From Jewitt's incomplete account it seems likely that the *Boston*, bow into the sloping beach in front of the Nootka village in Friendly Cove, burned to the waterline and sank, stern first. It is possible that a good portion of the *Boston*'s bottom lies beneath the waters of Nootka Sound close by the site of the Nootka village in Friendly Cove.

The ship's bottom, covered by copper sheeting, whether charred or not, should be intact. Ideally there would be large masses of partly molten beads that could still be identified by type and perhaps many other items still preserved in the cold, protected waters of Friendly Cove.

In these northern waters preservation of wrecks is better than in tropical waters. The build-up of coral is lacking, and the damage from taredo worms is not so great. I have personal knowledge of the remains of a clipper ship that burned and sank in a bay of Juan de Fuca Straits in 1883, some eighty years after the sinking of the *Boston*. The remains of the clipper ship which, like the *Boston*, had copper bottom sheeting are in excellent condition in about fifty feet of water. Although taredo worms have been at work, the ship's planking, decking, knees, etc., all retain their shapes and are in position.

Although the data that have been presented here are not sufficient for the formulation of a chronological system based on bead types, there is, nonetheless, enough information indicative of variability in glass beads and the dates of their introduction to warrant additional research using the same kinds of sources and the same methods. For instance, the further potential of intact assemblages of glass beads that might be obtainable from shipwrecks and other tightly datable sites could well be

realized in the near future. More work with documented museum collections in the Old World is needed. In general the older ethnological specimens from America are in European museums, and they should be studied in the context of bead types. Certainly new data will be forthcoming from historic sites. Historical archaeology, now in its infancy, is a rapidly expanding field, and surely many new site investigations will be undertaken in Northwest America. All of these lines of research should be pursued and should be fruitful. But such a combination is not the only possible approach to a chronological construct derived from glass trade beads.

It might be useful to try to calculate a straight line regression formula based on the diameters of the line holes in the beads, a method similar to that used by Lewis R. Binford (1962, 1972; Hanson 1971) in determining dates from the bores of kaolin pipe stems. My impression, based on a somewhat superficial examination of the so-called Russian or Hudson's Bay beads in the collections of the Thomas Burke Memorial Washington State Museum, is that the diameters of the line holes in the beads increased in size from early to late times. Unfortunately, I have not had the opportunity, in this context, to test this idea, but hopefully someone else will pursue this matter or I will at a later date. By the same token, I have not been able to carry my study of glass beads from the Northwest Coast beyond what has been presented here. However, I take satisfaction from the pleasure of the study itself and the hope that it will provide a point of beginning for someone else or even myself at a future time.

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