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## Material Culture Notes: Dating Colorless Glass Bottles

Douglas C. Wilson

*Portland State University*, [doug@pdx.edu](mailto:doug@pdx.edu)

Bob Cromwell

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# Material Culture Notes: Dating Colorless Glass Bottles

by Doug Wilson and Bob Cromwell, NPS Archaeologists

There are many ways to date a bottle, including embossed manufacturers marks, embossed labels, the bottle's manufacturing traces, its shape, and other characteristics. The Society for Historical Archaeology (SHA) and Bureau of Land Management's web site on historic glass bottle identification and information (developed by Bill Lindsey, <http://www.sha.org/bottle/>) represents a crucial (and very interesting) resource for historical archaeologists interested in bottle glass.

At Fort Vancouver in the 1970s, Historical Archaeologists David and Jennifer Chance (1976:133) noted that bottle glass color changed through time with a decrease in dark olive glass after 1874. They noted:

Most of the Hudson's Bay Company vessel glass is dark olive-green, a color that usually appears black unless the sherd is held to the light. Most of the remainder is aqua-colored, but some is clear. Only a handful of amber or brown sherds were found in the Hudson's Bay Company deposits.

Today, "colorless" glass is the term we use in preference to "clear" glass in describing bottles, as it does not confuse the translucence qualities of the glass with its color. Citing the SHA web site, archaeologists recently attempted to use glass color to help date historical deposits associated with the project to replace the Interstate 5 Bridge (the Columbia River Crossing Project). They tied their inferences to a brief reference on the SHA web site which suggests: "Generally speaking, bottles of colorless glass were relatively uncommon prior to the 1870s but became quite common after the wide spread use of automatic bottle machines in the mid to late 1910s" ([www.sha.org/bottle/colors.htm](http://www.sha.org/bottle/colors.htm)).

The question of using glass color as a meaningful classification device

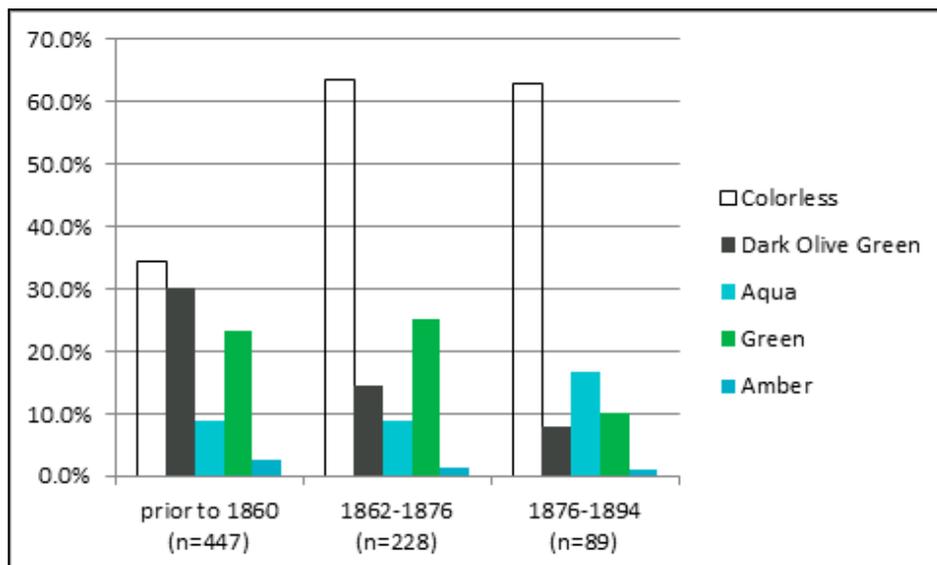


Figure 1. Relative frequencies of bottle glass (by color) in the Pond (Operation 11) excavated in 1974.

has been debated by historical archaeologists for nearly a generation now. As stated by Jones and Sullivan (1989: 12) in their seminal work, *The Parks Canada Glass Glossary*:

Because colour is a universal attribute of glass and is convenient for mending and establishing minimal vessel counts, it has been latched onto by some archaeologists as a classification device. Although classification by colour is simple to do, the end result is of little value for the following reasons: colour does not have a direct relation with glass type. . . ; colour is not related to the technology of glass object production. . . ; colour is only weakly related to the function of the object. . . Given these factors there is little justification for using colour as a means of classification. There is a very broad chronology of popularity of various colours over time; however that chronology cannot be applied to individual glass objects with any significant level of meaning.

Jones and Sullivan go on to say about colorless glass (1989: 13):

This term is used to describe glass with no colour and is preferable to terms like "clear," "white," "flint," or "crystal," which have not been used consistently by contemporary authors or in historical documents.

Given the earlier patterns noted by the Chances and recent attempts to use 1870 as a temporal marker for colorless bottles, the question is: How much colorless bottle glass exists at sites prior to 1870? At Fort Vancouver, that represents sites related to both the fur trade and the early U.S. Army. In the absence of other technological information, how much colorless glass might be suggestive of a particular time period in the 19th and early 20th century? While the Chances did not measure the frequencies of their bottle glass, luckily their collections are still available for study in our museum facility.

A recent project by Portland State University undergraduate student Diana Hillstrom reanalyzed

# Material Culture Notes: Colorless Vessel Glass

*continued from page 7*

glass fragments from some of these collections to look at how much colorless glass was present in well-dated deposits. She explored the bottle glass excavated from a pond on the southern edge of the Hudson's Bay Company Village (at the Chances' "Operation 11"). We have summarized her results in Figure 1. Deposits that are directly tied to the Hudson's Bay Company Village date to prior to 1860 when the Company left the site permanently. Colorless glass represents 34% of these deposits, while the later 19th century deposits (all related to the U.S. army's use of the site) contains about twice this amount by percentage. It should be noted that all of these deposits predate automatic machine-made bottles which make their appearance at the start of the 20th century. Dark olive glass decreases through time, from 30% prior to 1860 to about 8% after 1876. Green glass decreases from about 25% to 10% after 1876, while in the same time frame aqua glass increases from about 9% to 17%.

These results are similar to that found on the earthen floors of Hudson's Bay Company-era Fort Vancouver Village houses. For example, House 4b, just west of the pond, contained 19% colorless glass fragments and 56% dark olive green glass fragments (n=738). The "Kanaka House", identified from the 1846 Covington map, was a house inhabited primarily by Native Hawaiians. It contained 24% colorless and 68% dark olive green glass (n=185 fragments). Interestingly, the nearby Tayenta's House, which was inhabited by an Iroquois worker with a Chinookan wife and their family, contained only about 5% colorless glass with over 90% dark olive green glass (n=1268). While these results indicate that dark olive green glass was more prevalent at Fort Vancouver prior to 1870, there is also abundant colorless glass.

Colorless glass is harder to manufacture than other colored glass

as it needs an impurity-free silica base or additives (decolorizers) that will counteract the effects of impurities. The "natural" color of glass is usually a shade of green or aqua. This does not mean that colorless glass was impossible to manufacture prior to 1870. According to the SHA website, Venetian glassmakers made a form of colorless glass called *crystallo* as early as the 15th century. English glassmakers made a colorless glass called "flint" glass in the 18th century from calcined flint. Based on our results, above, it appears likely that some of this flint glass was making its way into the Oregon Country long before 1870. One of these early "flint" bottles is shown in the picture. It was recovered from a privy (also known as an outhouse) behind the Indian Trade Store from deposits dating to ca. 1836-38 to 1860. Lester Ross, Bryn Thomas, Charles Hibbs, and Caroline Carley reported on it. It is a free-blown apothecary bottle where a paddle was used by the glassblower to flatten the sides. This technology predates the much more common blown-into-mold bottles we usually find at Fort Vancouver from Hudson's Bay Company contexts.

Obviously, inferences on bottle color and dating are fraught with difficulties. One issue to consider is how the sites under study formed. Bottles and fragments of bottles may have been deposited at the site in different ways depending on what type of bottle it was, and how and where it was used. Stephanie Simmons' thesis at Portland State University is looking at indigenous reuse of bottles at the Fort and elsewhere. Her results may help us to better understand aspects of historical bottle disposal at the site.

Further work is clearly needed on how types of bottles reflect the relative frequencies of their fragments. Use of bottle color by itself seems very problematic. Our recommendation, and one echoed by the SHA web site and Jones and Sullivan, is to treat color with caution and to use all of the



*Free-blown colorless panel bottle found in the Indian Trade Store Privy (circa 1836-1860).*

available technological characteristics of bottle fragments to help ascertain the date of a deposit.

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