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The Cover: Ancient glass beads from Egypt and eastern Mediterranean area, c. 1300 B.C.-300 A.D. Cover photograph by Phil Shima.

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HUDSON'S BAY COMPANY GLASS TRADE BEADS: MANUFACTURING TYPES IMPORTED TO FORT VANCOUVER (1829-1860)

Lester A. Ross[1]

For nearly half a century, the primary importer of glass beads to the Pacific Northwest was the Hudson's Bay Company. Shortly after merging with the North West Company in 1821, the Hudson's Bay Company began moving into the Northwest and established its Columbia Department. This Department covered the territory from Alaska to California, from the Rocky Mountains to the Pacific Ocean, and subsequently included over 40 trading establishments. Headquarters for this Department were established at Fort Vancouver (now Vancouver, Washington) in 1824, and all imports brought into this Department from 1824-1845 were first landed at Fort Vancouver.

Since 1947, the National Park Service has conducted archaeological excavations at the site of the second Fort Vancouver (established in 1829); and those material cultural remains which have been recovered are now providing unparalleled documentation of the trade goods imported to the Northwest throughout the mid-19th Century. Glass beads were the most frequently recovered artifacts, and to date nearly 100,000 beads have been analyzed. Over 150 descriptive varieties of beads have been identified; and, by measuring length and least diameter of each bead, the various bead sizes for each variety have been determined. In this article, however, no attempt will be made to discuss each individual bead variety; but rather, to discuss the techniques used to manufacture these beads.

Thus far, five manufacturing techniques have been recognized for the glass beads found at Fort Vancouver—Tube, Wire Wound, Mandrel Pressed, Blown and "Prosser" Molded.

Tube Beads

The most common bead type imported to Fort Vancouver was the tube bead (comprising approximately 95% of all beads recovered). A generalized manufacturing sequence for simple, single layered tube beads is shown in Fig. 1, and this sequence was based upon published accounts (Kidd and Kidd, 1970:47-49; van der Sleen, 1973:23-26) as well as observations of finished beads from Fort Vancouver.

The tube bead manufacturing sequence began with molten glass (i.e., metal) attached to a blowpipe (Fig. 1*a*); and while plastic, air was

forced into the metal thereby forming a bubble of glass (Fig. 1*b*). Next, an iron rod was attached to the bubble opposite the blowpipe (Fig. 1*c*); and by pulling the rod and blowpipe in opposing directions, a tube (or cane) was formed (Fig. 1*d*). After cooling, the tube was cut into bead-length sections (Fig. 1*e*); and if rounded edges were desired, then these bead-length sections were placed with a mixture of ash and fine sand into a tumbler which was then rotated over a fire (Fig. 1*f*). Tube beads with diameters roughly equivalent to length were then sorted into various sizes by sieving (Fig. 1*g*), and these sizes were either sold by weight or strand.

The above technique for manufacturing canes may not have been the only technique available. Recently, a Portland, Oregon, bead dealer (Ken Dithman) visited Murano, Italy; and he observed that the present-day method for manufacturing canes consisted of winding a stream of molten glass onto a rotating, sloping, conical mandrel. As the molten glass slid down and wrapped itself around the mandrel, it formed a sleeve of glass which gradually became smaller in diameter until it slipped off the mandrel onto a conveyer belt. Thus, a continuous tube was formed, not by stretching a bubble, but by winding a stream of glass. When this technique was invented and when it replaced the bubble technique has yet to be determined. Further, it is not clear if the two techniques could be distinguished by analyzing the finished beads. Hopefully, dated collections from bead factories, such as those described by Richard and Dorothea Casady (1974), will be analyzed; and subsequently, temporal limits for specific techniques can be hypothesized.

Needless to say, the manufacturing sequence presented in Fig. 1 does not attempt to portray the many techniques which were employed to decorate tube beads. Such techniques, for beads from Fort Vancouver, included striping, layering, marvering and grinding; and, as presently planned, these techniques will be described in future articles.

Wire Wound Beads

Wire wound beads were the second, most common bead type imported to Fort Vancouver (comprising approximately 3-5% of all beads recovered). Generally speaking, beads of this type were produced by winding molten (or at least plastic) glass onto a rotating wire (Fig. 2). Bead varieties produced by this method were made individually, and each beadmaker apparently had a mental template of the size and shape for each variety being produced. Thus, if a beadmaker were producing a single variety, he would attempt to make all beads of that variety the same shape and size; and there would have been no need to subsequently sort or sieve such beads

into separate sizes or groups. This hypothesis is supported by observations of wire wound bead varieties at Fort Vancouver.

Again, as with tube bead decoration, the techniques for decorating the wire wound beads from Fort Vancouver were highly variable and included: layering, spiral applications, molding and grinding.

Mandrel Pressed Beads

As far as can be determined from available publications (e.g., Beck 1973; Kidd and Kidd 1970; van der Sleen 1973), mandrel pressed beads have never been described. From the 84 specimens presently at Fort Vancouver, a complete manufacturing sequence has been hypothesized (Fig. 3). This hypothetical sequence purports to accurately portray each step within the manufacturing process, but not the exact procedure nor the exact equipment utilized.

Mandrel pressed beads at Fort Vancouver were made by pressing two pieces of molten (or plastic) glass together in a mold (Fig. 3*a*). The resultant bead blank had a conical hole which did not pass through the entire bead. This bead blank was placed upon a mandrel and random facets were ground over the entire surface (Fig. 3*b*); and after faceting, the remaining portion of the hole was punched through the bead (Fig. 3*c*).

For each step of the process, one or more beads at Fort Vancouver can be found which definitely documents the activities depicted. Some beads have an unfused seam in the lower hemisphere—demonstrating the beginning and end of the glass wrapped around the mandrel—while the upper hemisphere shows no seam. All beads have a mid-line seam which marks the fused upper and lower hemispheres. This mid-line circumscribes each bead, and on opaque colored beads it appears as a dark line. A few beads retained remnants of their original molded surface (i.e., the surface which was removed during faceting). All beads have ground facets (24-53) arranged randomly over the surface of the bead except for the top and bottom. Most beads did not have facets at the margins of the wide portion of the conical hole (i.e., the bottom), thus suggesting that the beads were held in a similar fashion while the facets were being ground. All beads had a facet ground on the top of the bead at a right angle to the length. This top facet was ground before the final hole was produced and may have facilitated the hole punching process. Production of the top hole by percussion could have shattered the top of the bead, but with one facet on the top, radiating lines of percussion force would terminate at the facet edges, thus producing a uniform conical hole.

Blown Beads

Blown beads were quite rare at Fort Vancouver (only 3 specimens have been recovered), and all were individually produced by the method depicted in Fig. 4. By this method, a closed, grooved tube was formed by blowing glass into a mold (Figs. 4*a-b*). Next, a single upset (in some cases two) was produced by heating one portion of the tube while rotating and forcing air into the tube (Fig. 4*c*). Finally, the ends were formed by heating and crimping the tube (Fig. 4*d*), snapping off unwanted portions (Fig. 4*e*) and subsequently fire polishing the broken edges (Fig. 4*f*).

"Prosser" Molded Beads

In 1973, Dr. Roderick Sprague described the "Prosser" process for dry molding ceramic buttons and hypothesized that a similar (if not identical) process was used to produce a variety of ceramic beads found at the Palouse Burial Site in southeastern Washington (Sprague 1973). Subsequently, through discussions between Dr. Sprague and myself, it became apparent that a manufacturing technique, similar to Richard Prosser's 1841 dry molding technique, had been applied to the manufacture of glass beads. Beads produced by this technique are herein classified as "Prosser" molded beads, and the manufacturing sequence has been hypothesized in Fig. 5.

At Fort Vancouver, only one "Prosser" molded bead has presently been recovered, and its shape is depicted in Fig. 5*d*. This bead has been identified as glass on the basis of numerous small air bubbles within the bead. It was molded from one piece of glass within a two-piece mold (Figs. 5*a-b*), and does not appear to have a surface glaze. After removal from the mold, the bead while still plastic, was placed on a flat surface (Fig. 5*c*) thus flattening one end as well as creating small pits on the flattened surface (an "orange peel" surface identical to that produced on "Prosser" dry molded ceramic buttons and beads).

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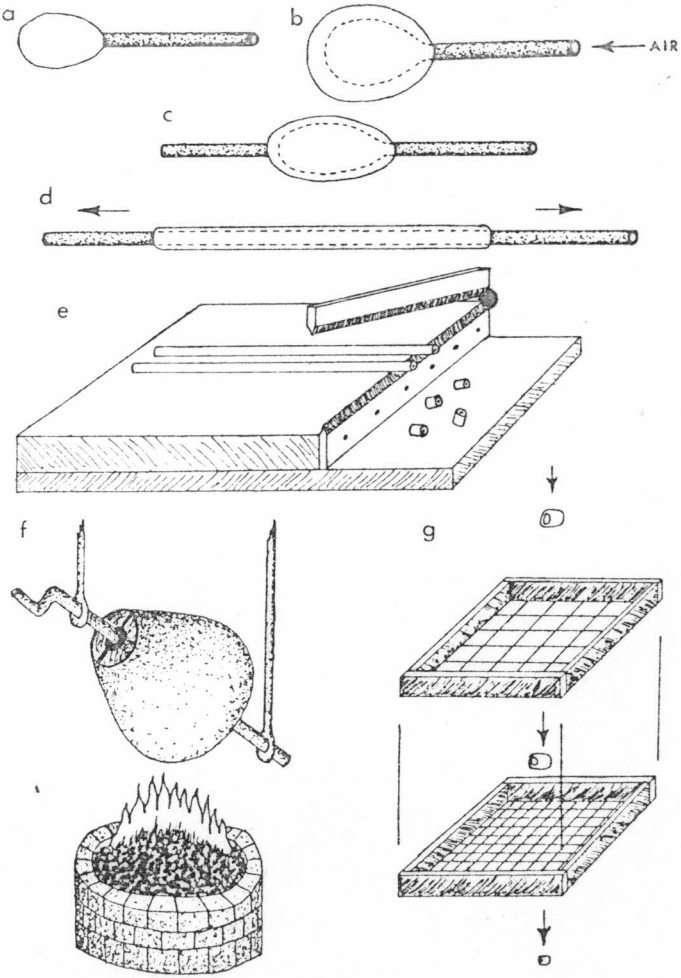

Fig. 1. Manufacturing sequence for tube beads: *a.* Glass on blowpipe, *b.* Bubble formation, *c.* Attachment of rod, *d.* Tube formation, *e.* Cutting, *f.* Hot tumbling, *g.* Sieving.

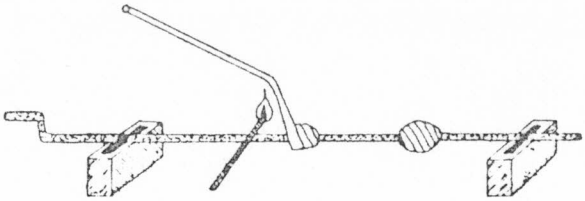

Fig. 2. Wire wound bead manufacture.

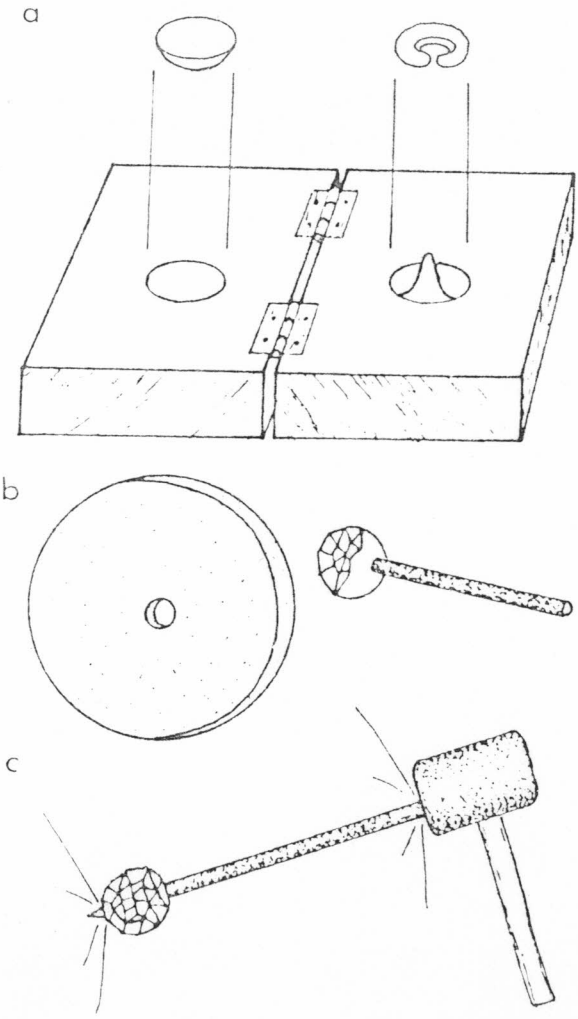

Fig. 3. Manufacturing sequence for mandrel pressed beads: *a.* Formation of bead "blank", *b.* Grinding of facets, *c.* Final hole punching.

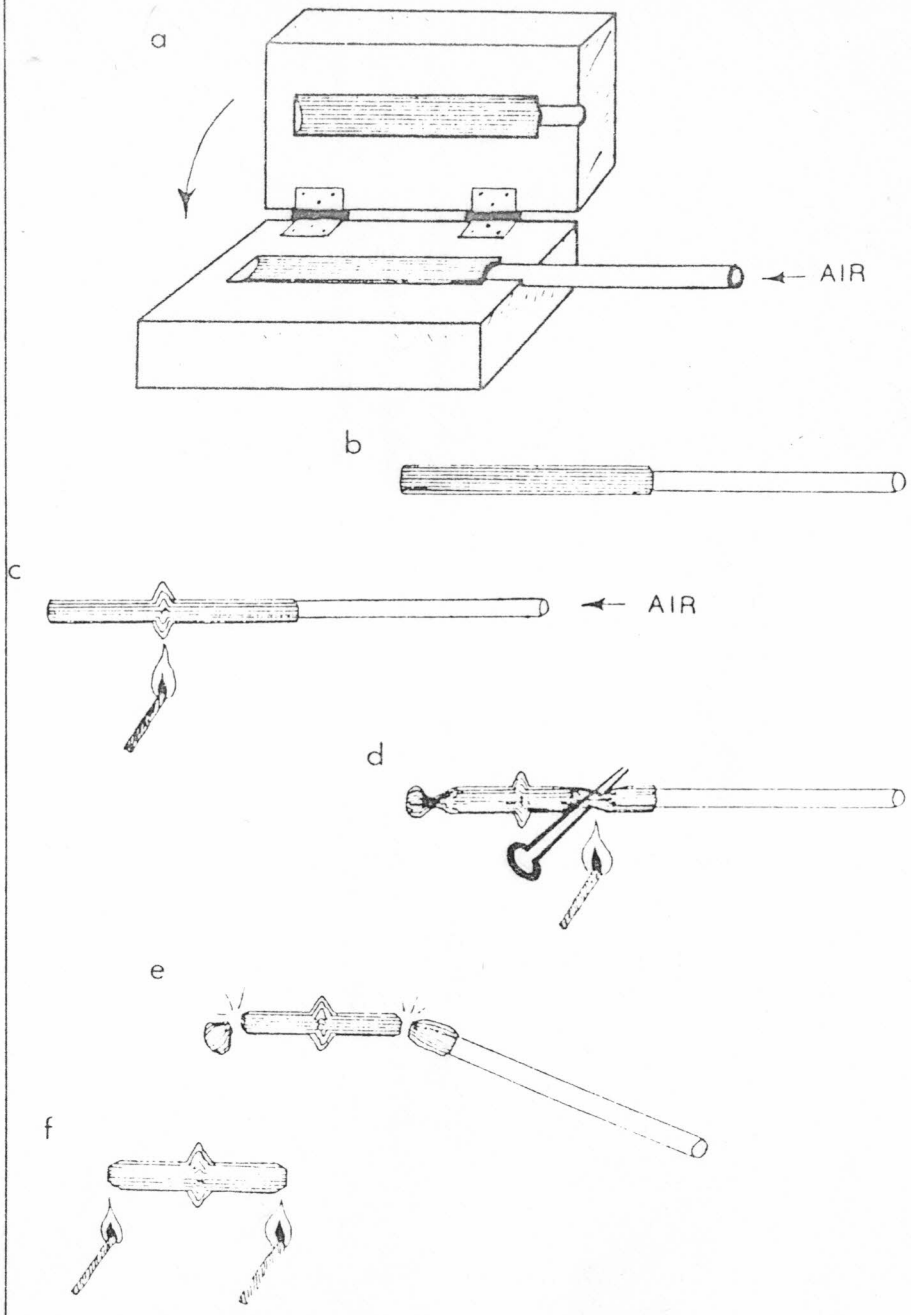

Fig. 4. Manufacturing sequence for blown beads: *a.* Glass tube blown in mold, *b.* Grooved tube removed and cooled, *c.* Upset decoration formed, *d.* Tube crimped, *e.* Ends snapped, *f.* Ends fire polished.

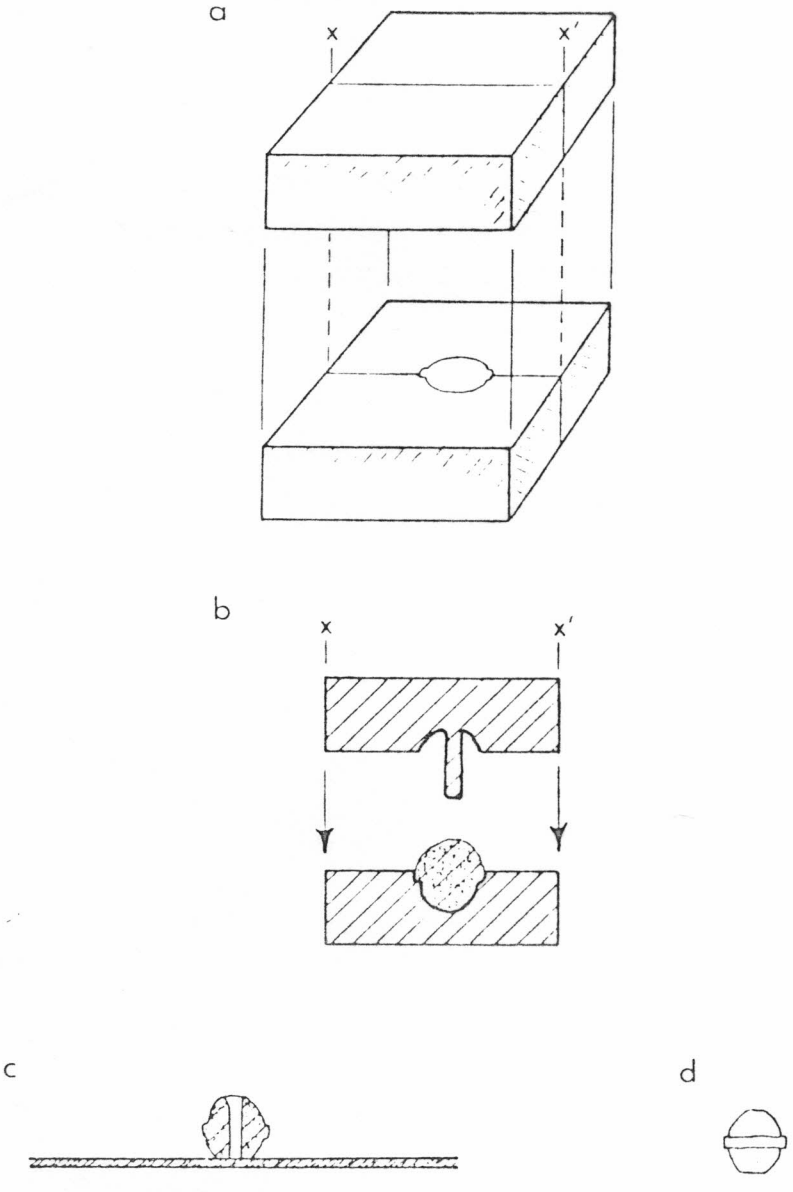

Fig. 5. Manufacturing sequence for "Prosser" molded beads: *a.* Two-piece mold, *b.* Cross-sectional view of molding process, *c.* Molded bead removed from mold and placed on flat surface, *d.* Finished bead.