Beads from the *Great White Arabia:* A Mid-19th-Century American Steamboat

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Loaded with 200 tons of goods heading for Omaha, Nebraska, and Sioux City and Council Bluffs, Iowa, the steamboat Great White Arabia *hit a snag and sank near Kansas City in 1856. In 1989, a group of salvors excavated the wreck and recovered almost the entire cargo which was in a remarkable state of preservation. Among the finds were several million glass embroidery beads, as well as several hundred blown specimens in various shapes, sizes, and colors, some of which formed the heads of fancy stickpins. Due to their fragility, blown beads are seldom found in archaeological contexts, so the* Arabia *specimens are especially significant and comprise the largest collection of such beads found at a North American site. Coming from a tightly dated context, the beads reveal exactly what was being brought to a specific area of the American frontier in the mid-1850s. They also provide information concerning the different techniques used to produce them.*

THE *GREAT WHITE ARABIA*

Constructed in Brownsville, Pennsylvania, in 1853, the *Great White Arabia* was a sidewheeler cargo steamer (Pl. IVB) designed to ferry supplies and passengers to riverfront settlements. After spending its first three years on the Ohio and Mississippi rivers in the hands of Captain John Shaw, it was purchased by Captain William Terrill to ferry cargo on the Missouri River between St. Louis, Missouri, and Fort Union, North Dakota. On August 30, 1856, the *Arabia* departed St. Louis bound for the frontier towns of Sioux City and Council Bluffs in Iowa, and Omaha City in Nebraska, carrying 200 tons of cargo and 130 passengers. Most of the passengers were women and children traveling to rejoin husbands and fathers who had gone ahead to build homes in the aforementioned new settlements. On the evening of September 5, as the passengers were sitting down to dinner, the *Arabia* struck a snag beneath the river surface. The boat, with its heavy cargo, sank in about 10 minutes, less than one hour north of Kansas City, Missouri. All passengers and the crew survived, and were taken to the nearby town of Parkville, Missouri, for the night. The boat and its cargo were considered a total loss (Hawley 1989, 1995, 2005).

SALVAGING THE *ARABIA*

The first recovery attempt came in 1877, financed by the Tobener Brothers who were Kansas City tobacco merchants. It was believed that the ship's cargo included Kentucky bourbon, but when all they found were felt hats, the salvage attempt was discontinued.

A second attempt was made 20 years later when Gale Henson of Holt, Missouri, reached the deck of the *Arabia* by constructing a steel caisson tube. The team dug into the cargo in three places, again expecting to find whiskey, but encountered only boots and lumber. Another unsuccessful attempt followed in 1975. By this time the river had changed its course and the wreck, having been silted over, was now under a farmer's field about a half mile from the actual river channel. The project failed primarily because the salvagers could not keep ground water from filling the excavation area.

Finally, in November of 1988, a consortium of eight individuals (Harland "Bob" and Florence Hawley, Greg and Karen Hawley, David and Laurie Hawley, and Jerry and Joan Mackey), operating under the name River Salvage Incorporated, obtained permission from Norman Sortor to dig into his field after the soybean crop had been harvested.

The wreck was located using a magnetometer, a device that detects metal concentrations in the ground. Once the general location had been found, a small drill was used to locate the perimeter of the boat (Fig. 1). On November 13, River Salvage began uncovering the *Arabia*. Using heavy equipment supplied by a contracting company owned by Dave Luttrell and a water pumping system designed by Bob Hawley, the crew excavated an area the size of a football field (Pl. VA). After two weeks of digging, they reached the deck of the Arabia about 11 m (35 ft.) below the surface. For the next 10 weeks, they worked 16-hour days to recover hundreds of wooden boxes and barrels full of cargo and

Figure 1. The site of the *Great White Arabia* prior to excavation. The outline of the boat has been determined by magnetometer readings and drilling (photo: David Hawley).

Figure 2. The cargo included various comestibles including jars of pickles with the contents perfectly preserved (photo: David Hawley).

river silt (Figs. 2-3; Pls. VB-VC). Some of the boxes had been crushed under the weight of the collapsed deck. Approximately 4,000 pounds of cargo were recovered each day, in the end totaling 150 tons.

Once the water was drained to a level below the cargo, the crew knew they had to work fast to reduce the deteriorating effect of exposure to air. Tinware recovered near the end of the project was in significantly worse condition than that which had been removed early on due to the effects of oxidation. A temporary on-site preservation lab was set up to stabilize the artifacts as they were removed. Depending on the material, some were frozen, others were placed in water tanks, while items made of glass, porcelain, and crockery required no special preservation process. Protein-based materials like wool, silk, furs, and leather were found in very good condition, whereas cellulose-based materials such as paper and cotton had almost entirely disintegrated. For example, only the very core of a bolt of cotton calico material survived. Cotton thread had to be replaced in wool jackets, a beaver-hair coat, wool underwear, wool shirts, and leather boots to return them to their original condition.

An archaeologist from the state of Missouri was employed to catalogue the cargo as it was removed, so none of the discoveries could be disputed. The cargo was documented using video and still photography and sketches made by the archaeologist. On February 11, 1989, with the excavation complete, the River Salvage crew turned off the water pumps and let the water reclaim the empty hull of the *Arabia* (Fig. 4).

As a result of the efforts of River Salvage, Inc., the *Arabia*'s historic cargo can now be viewed and studied. The excavation led to the creation of a 30,000-sq.-ft. museum and research facility dealing with life on the American frontier. Located a few blocks from the Missouri River in downtown Kansas City, Missouri, the *Arabia* Steamboat Museum displays thousands of preserved artifacts in hands-on historic exhibits that recreate the look and feel of 1856 steamboat life. On display is a reconstruction of one of the

Figure 3. Uncovering a shipment of felt hats (photo: David Hawley).

Arabia's matching 28-foot paddlewheels. The original stern hull, boilers, engines, anchor, and paddlewheel hub are also on display. The museum contains a full-scale recreation of the *Arabia*'s 171-ft. boat deck, a general store, and a frontier cabin exhibit to enhance the treasure displays. There is also a hands-on tool and hardware display, and an open conservation lab where one can see how the artifacts are preserved. The *Arabia* Steamboat Museum is a few hundred yards from the old Westport Landing, believed to be the boat's last stop on September 5, 1856 (Hawley 1989, 1995, 2005).

THE CARGO

The Treasures of the Steamboat *Arabia* is the largest collection of pre-Civil War steamboat cargo in the world. The 150 tons of artifacts, dating tightly to one day in September of 1856, create a rare historic snapshot of mid-19th-century global manufacturing and trade. They also provide an accurate benchmark to date other 19th-century collections. But more specifically they provide a new perspective on the tastes and quality of life enjoyed by frontier families.

It is not just the quantity but the variety of items recovered from the *Arabia*'s cargo hold that is staggering. Among newly patented items in the 1850s are canning jars, wooden matches, and rubber products. Unexpected items include shoes with eyelets, colored shoelaces, ready-to-wear women's sweaters, and prefabricated plank houses. There are also luxury items such as fur coats, fine jewelry (Pl. VIA, top), perfumes, cognac, wine, and champagne. Footwear is represented by 4,000 leather boots and shoes (Fig. 5), from 3-in. children's sizes to knee-high gentlemen's boots adorned with gold-leaf crests, as well as 100 pairs of India-rubber overshoes made by the Goodyear Rubber Shoe Company. Sewing supplies include pins, needles, scissors, buttons, thimbles, thread, and 65 bolts of fabric, including a 100-yard bolt of black silk from China. There are 150 full leather hides as well as writing pens in 63 different styles and even some marbles. Tableware encompasses over 1,000 pieces of china, including Wedgewood, found packed in straw.

Representing hardware are such items as deadbolts, door knobs, keys, hinges, square nails, wood screws, and chains. Tools include levels, tape measures, wrenches, saws, hammers, picks, shovels, traps, drills, fireplace tools, axes, awls, and augers. In the comestibles category are pickles (Fig. 2), pie filling, peppercorns, catsup, cheese, nuts, sardines, oysters, ale, and whiskey.

Imported commodities include perfume, buttons, pins, needles, and ink pens from France; gilt-decorated dishware, sculpted vases, brass locks, and iron tools from England; trade guns from Belgium; tobacco boxes, chews, and cigars from South America; coffee from Brazil, Java, and Jamaica; allspice and cinnamon from the Orient; and glass beads from Europe.

THE BEADS

All of the beads recovered from the *Arabia* were found in two large general-merchandise boxes situated amidships, marked for delivery to Council Bluffs, Iowa. The boxes were approximately 6 ft. long, 3 ft. wide, and 2 ft. deep. They contained a variety of items such as buttons, jewelry, cosmetics, toothbrushes, slate pencils, eyeglasses, hairbrushes, perfume, powder flasks, and many other common articles used everyday by frontier families. Beads were found scattered loose throughout the boxes. As time did not permit their recovery on site, the silt from the boxes was packed into containers and then screened after the excavation

Figure 4. The hull of the *Arabia* after excavation. The paddle wheels are visible at the sides and the triple-tank boiler and associated water pump are at the rear (photo: David Hawley).

Figure 5. Some of the recovered shoes, boots, and other leather goods on display in the *Arabia* Museum (photo: David Hawley).

was completed. This process resulted in the recovery of an estimated 3.5 million beads. Glass beads predominated but several metal specimens were also recovered.

The glass specimens represent three major manufacturing types: drawn, wound, and blown. These are classified below using an expanded version of the system developed by Kidd and Kidd (1970) as presented in Karklins (1985). Beads that do not appear in the Kidds' lists are marked by an asterisk (*). Colors are designated using the codes provided in the *Color Harmony Manual* (Container Corporation of America 1958) as used by the Kidds as well as the better-known Munsell color notation system (Munsell Color 1976). The *Color Harmony* names are further supplemented, where correlatives exist, by the more descriptive ones provided in the ISCC-NBS Centroid Color Charts (Karklins 1989). Diaphaneity is designated using the terms opaque (op.), translucent (tsl.), and transparent (tsp.).

Drawn Beads

These consist of sections of tubing drawn out from a hollow globe of molten glass. Most of these were subsequently rounded by tumbling them in a heated drum. The circular embroidery beads (also commonly called seed beads) are generally oblate in form but range to very short tube sections with finished ends. There are 4 tubular (Pl. VIA, bottom) and 27 circular (Pl. VIB, top) varieties.

Due to the overwhelming number of circular embroidery beads, most of which remain unsorted, it was not possible to get an accurate count for each variety. Consequently no quantitative data are provided for them below though some comments on relative frequency are provided in the Discussion and Conclusion section. The quantities listed for the tubular beads are based on an actual specimen count.

Ia*. Long tubular; satin sheen, tsl. white (a; N 9/0); unfinished ends; thin walls; 76 specimens.

Diameter: 2.0-2.9 mm Length: 13.1-14.4 mm

Ia*. Long tubular; satin sheen, tsl. olive yellow (1 le; 10.0Y 5/6); unfinished ends; very thin walls; 21 specimens.

Diameter: 1.8-2.8 mm Length: 11.6-14.4 mm

Ia*. Long tubular; satin sheen, tsl. apple green/light yellowish green (23 ic; 10GY 6/6); unfinished ends; thin walls; 51 specimens.

Diameter: 1.4-2.3 mm Length: 9.1-11.0 mm

Ic'*. Long tubular, hexagonal cross-section, twisted; mustard brown (2 pi; 2.5Y 4/6); unfinished ends; very thin walls; 27 specimens.

Diameter: 1.6-2.3 mm Length: 9.0-10.7 mm

IIa*. Circular; tsp. scarlet (7 pa; 7.5R 4/14).

Diameter: 1.4-2.8 mm Length: 1.2-1.9 mm

IIa7. Circular; op. black (p; N 1/0).

Diameter: 1.3-3.2 mm Length: 0.7-2.7 mm

IIa12. Circular; tsl. oyster white/grayish white (b; N 8/0).

Diameter: 1.5-2.0 mm Length: 0.9-1.3 mm

IIa14. Circular; op. white (a; N 9/0).

Diameter: 1.2-2.5 mm Length: 0.7-1.7 mm

IIa*. Circular; tsp. pale blue, opalescent (15 ca; 7.5B 8/2).

Diameter: 2.0-2.8 mm Length: 1.1-1.9 mm

IIa*. Circular; op. sunlight yellow/brilliant yellow (1½ ga; 5Y 8/8).

Diameter: 2.1-3.0 mm Length: 1.9-2.5 mm

IIa*. Circular; tsp. pale sunlight yellow (ca. 1½ ga; 5Y 8/8).

Diameter: 1.2-1.9 mm Length: 0.8-1.1 mm

IIa*. Circular; tsp. lemon yellow/brilliant greenish yellow (1 la; 10Y 8/10).

Diameter: 1.3-1.9 mm Length: 0.9-1.2 mm

IIa*. Circular; op. olive yellow/dark greenish yellow (1 le; 10Y 5/6).

Diameter: 1.6 mm Length: 1.0 mm

IIa*. Circular; op. grass green/strong yellowish green (23 pe; 10GY 5/10).

Diameter: 2.2-3.2 mm Length: 1.3-2.5 mm

IIa*. Circular; op. dark palm green (23 ni; 10GY 4/4).

Diameter: 1.6-1.7 mm Length: 1.2 mm

IIa*. Circular; tsl./op. bright green (22 nc; 2.5G 5/10).

Diameter: 1.2-1.9 mm Length: 0.8-1.4 mm

IIa*. Circular; tsp. dark green (22 pi; 2.5G 3/6).

Diameter: 2.0-3.3 mm Length: 1.0-2.5 mm

IIa*. Circular; op. emerald green (21 nc; 10G 5/10).

Diameter: 2.7-2.8 mm Length: 1.6-2.2 mm

IIa*. Circular; tsp. turquoise green (20 nc; 5BG 4/8).

Diameter: 3.1-3.9 mm Length: 2.0-2.9 mm

IIa*. Circular; tsl. light aqua green (19 ea; 7.5BG 8/4).

Diameter: 1.7-1.8 mm Length: 1.1-1.3 mm

IIa*. Circular; tsp. bright turquoise (18 la; 7.5BG 6/8).

Diameter: 2.1-3.9 mm Length: 1.2-3.5 mm

IIa43. Circular; tsl. bright blue (16 lc; 5B 5/7).

Diameter: 1.8-3.4 mm Length: 0.9-2.4 mm

IIa*. Circular; tsl. cerulean blue (15 nc; 7.5B 4/8).

Diameter: 2.0-2.9 mm Length: 1.2-2.1 mm

IIa*. Circular; op. sky blue/strong purplish blue (15 ic; 7.5B 6/6).

Diameter: 1.4-1.8 mm Length: 0.6-1.1 mm

IIa*. Circular; op. copen blue (13½ ic; 5PB 5/7).

Diameter: 1.2-1.8 mm Length: 0.9-1.5 mm

IIa*. Circular; op. bright Dutch blue/moderate greenish blue (13 la; 7.5PB 4/11).

Diameter: 1.2-2.0 mm Length: 0.6-1.1 mm

IIa*. Circular; op. royal blue (12½ pc; 7.5PB 2/10).

Diameter: 2.0 mm Length: 1.3 mm

IIa*. Circular; op. orchid mist/grayish purplish pink (9 ec; 2.5RP 7/4).

Diameter: 2.0-2.9 mm Length: 1.3-2.1 mm

IIa58. Circular; tsp. light cherry rose/strong pink (7 ga; 5R 7/8).

Diameter: 1.2-1.9 mm Length: 0.7-1.0 mm

IIa*. Circular; op. light cherry rose/strong pink (7 ga; 5R 7/8).

Diameter: 2.0-2.6 mm Length: 1.0-1.9 mm

IVa*. Circular; tsp. scarlet (7 pa; 7.5R 4/14) on op. white (a; N 9/0).

Diameter: 1.4-4.0 mm Length: 1.0-2.6 mm

Wound Beads

These were formed by winding a viscid filament of molten glass around a metal mandrel until the desired size and shape were achieved. Strands or crumbs of contrastingly colored glass were sometimes applied to the surface to decorate the beads. Three varieties are represented and all form the heads of ornate brass stickpins (described below)(Pls. VIB, bottom and VIC, top).

WIc*. Oval; tsl. light gray (c; N 7/0); 12 specimens.

Diameter: 5.8-6.3 mm Length: 6.0-7.0 mm

WIIIb*. Oval; op. white (a; N 9/0) body decorated with an op. turquoise blue (17 pa; 10BG 4/8) band around the middle and a tsp. scarlet (7 pa; 7.5R 4/14) swirl around either end; 15 specimens.

Diameter: 5.8-6.5 mm Length: 6.3-6.8 mm

WIIIb*. Oval; tsp. emerald green (21 nc; 10G 5/10) body (appears black unless held up to a strong light) decorated with op. white (a; N 9/0) and op. redwood (6 ne; 10R 4/8) "crumbs;" 8 specimens.

Diameter: 6.0-6.5 mm Length: 6.7-7.5 mm

Blown Beads

The blown beads were produced using three different methods: 1) free blowing a glass bubble; 2) blowing a bubble in a drawn tube; and 3) heating and constricting a drawn tube. As most of the beads in the latter two categories were on display, it was only possible to get an accurate count for the free-blown specimens. The counts provided for the other varieties are based on figures in an early museum inventory so may be considered minimal though they do reflect the relative frequency of the different varieties as noted in the museum displays.

Free-Blown Beads

These consist of delicate clear glass bubbles that appear to have been individually free-blown. This is suggested by the fact that some of the perforations are off center and, while some specimens are just about perfect spheres, others are slightly lopsided, tending to rule out mold blowing. The edges of the perforations have been fire polished smooth.

There are two sizes. The smaller ones (Size A; 64 specimens; Pl. VIC, bottom) all formed the heads of brass stickpins (described below; Pl. VID, top) while the larger ones (Size B; 196 specimens; Pl. VID, bottom) probably comprised necklaces or were intended for such. Several of the pinheads exhibit traces of what appears to be the original internal colorant – a bright cinnabar. The other specimens exhibit white, gray, pink, brown, and black internal coloration, all of which are probably the result of silt seeping into the beads.

BIa*. Globular; tsp. light gray (c; N 7/0); internally colored.

Size A)
Diameter: 8.0-9.8 mm Length: 7.5-9.0 mm

Size B)
Diameter: 12.3-13.4 mm Length: 12.4-13.3 mm

Bubbles Blown in Drawn Glass Tubes

Beads in this group were made by blowing a series of bubbles in a heated, thin-walled drawn tube of spirally oriented satin-sheen glass which were subsequently broken apart. A tiny portion of the original tube protrudes from either fire-polished end. Two forms are represented: globular and ovate (Pl. VIIA, top), the latter ranging from football shaped to olive-pit shaped. There are five varieties.

BIa*. Globular; spiral satin sheen, tsl. pale ultramarine (13 pa; 6.25PB); 11 specimens.

Diameter: 6.7-11.9 mm Length: 8.3-13.7 mm

BIc*. Ovate; spiral satin sheen, tsl. apple green/light yellowish green (23 ic; 10GY 6/6); 32 specimens.

Diameter: 10.6-13.9 mm Length: 23.0-25.0 mm

BIc*. Ovate; spiral satin sheen, tsl. ultramarine (13 pa; 6.25PB 3/12); 29 specimens.

Diameter: 11.9-13.7 mm Length: 26.3-31.5 mm

BIc*. Ovate; spiral satin sheen, tsl. pale pink (8 ca; 10RP 8/4); 20 specimens.

Diameter: 5.1-9.3 mm Length: 13.4-21.1 mm

BIc*. Ovate; op. gilded; 5 specimens (Pl. VIIA, bottom).

Diameter: 3.9-4.2 mm Length: 5.0-6.6 mm

Constricted-Tube Beads

These beads consist of thin tube sections with constricted ends (Pl. VIIB, top). They were apparently produced by heating a tube over a flame at even intervals, at the same time pulling the tube in opposite directions, thus constricting it. The segments were then cut apart and the rough edges fire polished to round them. All the beads have a satin sheen with a straight grain. A number of specimens exhibit a black sub-metallic patina. There are five varieties.

BI.** Barrel-shaped; satin sheen, tsl. white (a; N 9/0); 6,755 specimens.

Diameter: 3.9-7.6 mm Length: 5.6-9.4 mm

BI.** Barrel-shaped; satin sheen, tsl. lemon yellow/brilliant greenish yellow (1 la; 10Y 8/10); 53 specimens.

Diameter: 4.8-5.5 mm Length: 5.6-7.0 mm

BI.** Barrel-shaped; satin sheen, tsl. apple green/light yellowish green (23 ic; 10GY 6/6); 400 specimens.

Diameter: 3.8-6.5 mm Length: 4.7-14.5 mm

BI.** Barrel-shaped; satin sheen, tsl. ultramarine (13 pa; 6.25PB 3/12); 425 specimens.

Diameter: 7.2-8.1 mm Length: 8.4-9.7 mm

BI.** Barrel-shaped; satin sheen, tsl. pale pink (8 ca; 10RP 8/4); 1,500 specimens.

Diameter: 4.2-7.4 mm Length: 5.4-9.2 mm

Metal Beads

There are two varieties of metal beads represented by three specimens. Each bead exhibits a longitudinal seam and appears to have been formed by rolling.

Silver-plated Brass

Short barrel; large perforation; 1 specimen.

Diameter: 5.1 mm Length: 4.4 mm

Brass

Globular; small perforation; 3 specimens (Pl. VIIA, bottom).

Diameter: 3.3 mm Length: 3.0-3.1 mm

DISCUSSION AND CONCLUSION

The wreck of the *Great White Arabia* is a unique time capsule whose remarkably well-preserved cargo reveals precisely what was being shipped to the American frontier in September of 1856. While one of the *Arabia*'s destinations, Council Bluffs, was relatively well established by this time, nearby Omaha and Sioux City were only surveyed and opened to settlement in 1854. This explains the presence of the large number of tools and hardware items, and two prefabricated frame houses in the hold of the *Arabia*.

The recovered beads were generally found loose in two large wooden crates but the presence of a substantial hank remnant (Pl. VIIB, bottom) as well as several small clusters of aligned seed beads suggests that the circular embroidery beads were doubtless all strung in hanks. Several hanks of blown beads in the author's collection that are of similar form to those found on the *Arabia* suggest that the blown satin-sheen beads were doubtless formed into hanks as well, if they were not already strung as necklaces. It is likely the hanks were wrapped in manilla paper, a common method of packaging bead hanks (Carroll 2004:22).

While beads formed only a minuscule portion of the cargo, their presence nonetheless reveals that even on the frontier, with all its hardships and privations, there was a desire for adornment. The circular embroidery beads may have been intended for some of the settlers but it is also quite possible that a good portion of them was also destined for trade with the Indians in the region as they were far more inclined to decorate their garments and possessions with variously colored glass beads at the time. (Women's publications of the period, such as *Godey's Lady's Book* [1852, 1859] and *Peterson's Magazine* [1859, 1861], call primarily for the use of white and crystal (colorless) beads, as well as small metal beads, in the decoration of various personal and household articles; no mention is made of beads for decorating garments save for an occasional accessory.) In fact, a number of the circular varieties have counterparts at the site of Fort Union, an American Fur Company post which operated on the Upper Missouri River near Williston, North Dakota, from 1828 to 1867 (Ross 2000:108-109). Interestingly, while excavations at Fort Union yielded a number of drawn tubular beads, many wound specimens, and several blown varieties, none are replicated in the *Arabia* material. A list of the beads stocked by some of the traders operating out of Council Bluffs during the decade preceding the sinking of the *Arabia* is presented in Table 1.

Due to their fragile nature, the blown beads were almost certainly meant for the settler's wives. The large and very large ovate and globular specimens are recorded as having found their principal use in necklaces (Neuwirth 1994:280). As such they would have been very comfortable to wear due to their lightness. Some of the smaller blown beads served a similar function (Neuwirth 1994:455) but they also found use in coverings for milady's head (Fig. 6) as well as fringes for shawls (Fig. 7)(Neuwirth 1994:427, 445, 455). They were also applied to such domestic items as needle books (Fig. 8) and pincushions of both White (Weaver 1863:317) and Native American manufacture. In the latter instance, op. white satin-sheen beads of the barrel-shaped constricted-tube variety were noted on four such objects produced by the

Figure 6. A woman's head covering adorned with small crystal beads and blown white satin beads, and a necklace incorporating ovate blown beads similar to those from the *Arabia* (*Der Bazar: Berliner Illustrirte Damen-Zeitung* 1867:96; Neuwirth 1994:455).

Tuscarora for the Niagara Falls tourist trade from the 1850s to the 1870s (Dolores Elliott 2009: pers. comm.). Measuring about 5.5 mm in diameter and 7.5 mm in length, the satin beads were used in combination with colorless seed beads (Pl. VIIC).

Some of the smaller, globular free-blown beads and all the wound beads formed the heads of 64 ornate brass

Table 1. Beads in Traders' Inventories Operating out of Council Bluffs, 1848-1852.

Quantity	Description	Price/Piece	Total Cost
A.S. Papin, August 1, 1848			
58	lbs. Black round beads [$0.25/lb.]	25	14.50
100	lbs. Blue round beads [$0.40/lb.]	40	40.00
15,700	White wampum [1000 beads/hank @ $2.50/hank]	250	39.25
24,550	BLK Wampum [1000 beads/hank @ $3.00/hank]	300	73.65
2¾	lbs. assorted sized beads [$1.00/lb.]	100	2.75
48	pairs 4 in Hair pipe [$0.25/pair]	25	12.00
P.A. Sarpy, July 20, 1849 NY			
30	Blue beads [$0.50/hank?]	50	15.00
30"	Chalk white beads [$0.28/hank?]	28	8.40
30	Black beads [$0.22/hank?]	22	6.60
34"	Carnelian beads [$0.60/hank?]	60	20.40
10	bu Blue agate beads [$0.75/bunch]	75	7.50
4	bu White agate beads [$1.50/bunch]	150	6.00
5	bu Blue barley corn beads [$0.75/bunch]	75	3.75
4	bu Chalk white pigeon egg beads [$0.75/bunch]	75	3.00
4	bu Red pigeon egg beads [$0.875/bunch]	87½	3.50
30,200	Blk wampum [1000 beads/hank @ $2.8125/hank]	281¼	84.94
20,000	White wampum [1000 beads/hank @ $2.375/hank]	237½	47.50
Mesuir, Ellis, Deorine, Cleghorn, and Fuller			
for Omaha trade			
10 lbs.	Black beads [$0.50/lb.]	50	5.00
10 lbs.	White chalk [$1.00/lb.]	100	10.00
for Pawnee trade			
20 lbs.	Black beads [$0.50/lb.]	50	10.00
20 lbs.	Chalk white beads [$1.00/lb.]	100	20.00
Duncan MacDonell, October 1, 1852			
4,000	White wampum [1000 beads/hank @ $4.00/hank]	400	16.00
5,000	Black do [1000 beads/hank @ $5.00/hank]	500	25.00
16	Ruby beads [$1.25/hank]	125	20.00
8	Sky Blue do [$1.00/hank]	100	8.00
20	Orange do [$.75/hank]	75	15.00
10	Garnet do [$1.50/hank]	150	22.50

Based on material prepared December 19, 1969, by Carl Hugh Jones, Curator of Anthropology, Nebraska State Historical Society, Lincoln (Davis 1972:311-312). Lester Ross (2009: pers. comm.) provided the pricing information in brackets.

Figure 7. Garnitures for shawls which incorporate (top) crystal beads, bronzed globular blown beads, and ovate satin-glass blown beads (*Der Bazar* 1865:198), and (bottom) white ovate, globular, and barrel-shaped forms (*Der Bazar* 1864:223)(Neuwirth 1994:427).

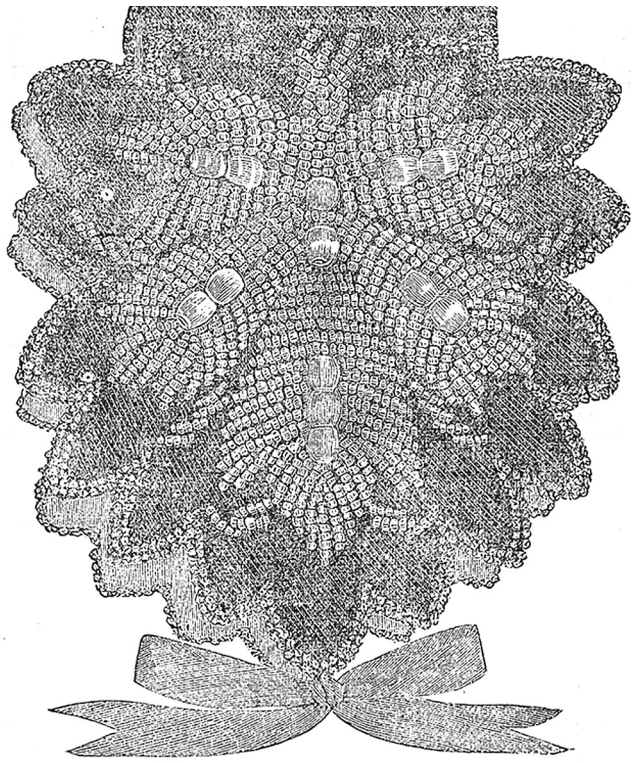

Figure 8. Clam-style needle case decorated with small white beads and white barrel-shaped blown beads (Weaver 1863:317).

stickpins (Pls. VIB, bottom to VID, top) that were commonly used as decorations for cravats. While silt had seeped into the blown beads, a number retained some of the original cinnabar coloration, probably in imitation of precious coral. The pins range in length from 55 to 63 mm (59 mm average) and have round shanks. The ornamental brass caps at either end of the beads are star shaped and have pebbled surfaces.

The bulk of the blown beads and the tubular drawn beads are composed of satin-sheen glass. This type is created by kneading the initial gather to introduce hundreds of tiny bubbles into the glass. When the gather is drawn into a tube, the bubbles become long fine tubes that refract the light and impart a silky appearance. Such beads are known by the trade name “Atlas” (Neuwirth 1994:153).

Although several European countries such as France, Italy (Venice), and Austria produced blown beads, especially in the form of false pearls, it is likely that the *Arabia* specimens originated in Bohemia or possibly Germany. The evidence for German production is in the form of several sample cards of large, globular blown beads similar to those recovered from the *Arabia* produced in Lauscha, Thuringia, Germany, in the 1840s-1850s (Jürgen Busch 1985: pers. comm.). Lauscha is probably best known for its blown

Christmas tree ornaments which continue to be made there today (Krebs Glass 2009). The evidence for Bohemian manufacture is far stronger. Beads practically identical to the very large globular and ovate specimens as well as the smaller barrel-shaped ones are illustrated by Neuwirth (1994:280, 283, 360-361) in her excellent book on the Gablonz bead industry. The globular and ovate beads she shows were produced by H. Göble of Gablonz (now Jablonec-nad-Nisou in the Czech Republic) and are believed to date to around 1837 (Neuwirth 1994:280). The barrel-shaped ones are on a sample card from the company of the Mahla Brothers (Pl. VIID) and date somewhere between 1878, when the company was founded, and 1913, when the card, along with several others, was apparently donated to the Technical Museum for Art and Industry in Vienna (Neuwirth 1994:300). These beads seem to have had a long temporal span as they, along with the globular and ovate types, also appear on several Bohemian sample cards believed to date to the second quarter of the 20th century (Neuwirth 1995:51, 59, 67). The Mahla Brothers also manufactured satin-sheen tubular beads (Neuwirth 1994:352) and it is likely the ones from the *Arabia* are also Bohemian products. Similarly the likelihood is that the circular embroidery beads also originated there as Bohemia was a serious manufacturing rival to Venice during the mid-19th century (Neuwirth 1994:158-159). The stickpins were also probably produced in Gablonz which is well known for its jewelry. The origin of the metal beads remains undetermined.

As mentioned earlier, it was not possible to get an accurate count of the circular embroidery beads. Some idea of their relative frequency is, however, provided by a museum inventory apparently made in the early 1990s when many of the beads had been sieved from their silt matrix (Table 2). The other recorded varieties apparently appeared in lesser quantities. Certainly David Henneberg (1993: pers. comm.) noted that the following colors were especially scarce, less than 50 specimens being encountered while sorting beads for size determination: tsp. scarlet, op. olive yellow, op. grass green, tsp. dark green, tsl. light aqua green, tsl. bright blue, and op. royal blue.

As for the blown beads, the barrel-shaped constricted-tube varieties predominated with white specimens being the most common (6,755 sp.). Pink was the next most common color (1,500 sp.) with blue (425 sp.) and green (400 sp.) in third place. Yellow specimens were scarce (53 sp.). The free-blown beads were next in frequency being represented by 196 necklace-size specimens and 64 pinheads. The globular and ovate blown examples were relatively scarce, each variety being represented by no more than 32 specimens.

In that the recovered beads formed a single shipment, it was hoped that some insight might be gained concerning mid-19th-century bead sizing. To start, a representative sample of the circular embroidery beads (1,150 specimens) was measured and graphed (Fig. 9). Visual inspection of the beads suggested there were five size populations and the recorded measurements tend to substantiate this although the data for the three largest sizes are limited (Table 3). Postulated Sizes A and B predominate in the collection while Sizes C-E are present in minimal quantities and may have only been represented by a few hanks. The means of the proposed size groups are at 0.4-0.6 mm intervals which corresponds fairly well to the intervals determined for bead variety IIa-ops-1 (0.45-0.56 mm intervals) at Hudson's Bay Company Fort Vancouver, Washington, which was in operation from 1829 to 1860 (Ross 1990:42). Although Ross measured and graphed a massive sample of 18,028 drawn beads representing 14 varieties (Ross 1976:697-737), IIa-ops-1 (Kidd IIa14) was one of the few varieties where four sizes were represented. Ross (2000:189) subsequently determined hypothetical historical bead sizes for the extensive glass bead collection recovered from Fort Union, North Dakota, which operated at about the same time (1828-1867) as Fort Vancouver. He postulated three possible sizing systems (A-C) for the circular embroidery beads with six to seven sizes in each. The average least diameters for the first three sizes in System A closely correspond to those determined for the *Arabia* specimens (the latter are in parentheses): Size 1, 1.55 mm (1.6 mm); Size 2, 1.9 mm (2.1 mm); and Size 3, 2.5 mm (2.6 mm). The next two sizes are totally dissimilar: Size 4, 3.8 mm (3.0 mm) and Size 5, 5.25 mm (3.6 mm).

Table 2. Estimated Counts (Based on Weight) of the Circular Embroidery Beads.

Description	Quantity
IIa*. Op. light cherry rose	600,000
IIa14. Op. white	450,000
IIa12. Tsl. oyster white	300,000
IIa58. Tsp. light cherry rose	300,000
IIa*. Tsp. turquoise green	300,000
IIa*. Op. sky blue	300,000
IVa*. Tsp. scarlet on op. redwood	300,000
IIa7. Op. black	150,000
IIa*. Op. sunlight yellow	150,000
IIa*. Tsp. lemon yellow	150,000
Total	3,000,000

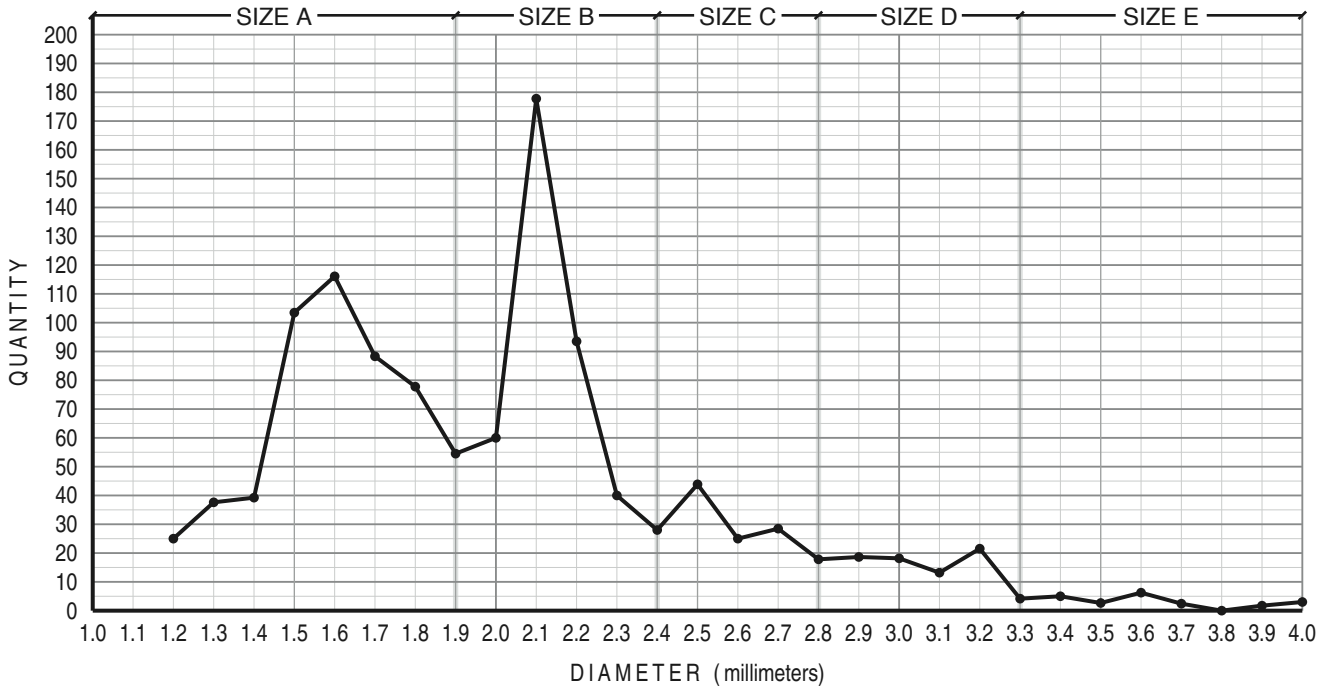

Figure 9. Probable size populations for the circular embroidery beads (n = 1,150)(drawing: David Weisel).

This is doubtless due to the relatively small sample of size 4 and 5 in the *Arabia* sample. In any event, the first three sizes would appear to be historically relevant.

The drawn tubular beads are less varied in size and only two sizes appear to be represented, based primarily on length (Table 4). The wound beads formed one size population (Table 5). Turning to the blown beads (Table 4), two distinct sizes were recorded for the free-blown globular specimens. As for the beads created by blowing bubbles in drawn glass tubes, there appear to be three sizes of the globular variety and four for the oval specimens but these groupings are quite hypothetical due to the small sample size. The constricted-tube beads tend to cluster into two rather broad size groups.

The beads recovered from the *Arabia*, while only a small part of the cargo, provide a great deal of information concerning what varieties were heading to the American frontier in the mid-1850s. The blown varieties are especially interesting as they are infrequently found in archaeological contexts due to their fragility and the *Arabia* specimens provide a wealth of information concerning their manufacture, form, and sizing. The stickpins with bead heads are a unique find with no known correlatives at other contemporary archaeological sites in North America. While the sinking of the *Arabia* was a tragedy for the settlers and merchants, it has turned out to be a blessing for those interested in frontier material culture.

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Table 3. Postulated Size Populations for the Circular Embroidery Beads (n = 1,150).

Size	Diameter	Length
A	1.2-1.9 mm (1.6 mm mode; 1.6 mm mean)	0.6-1.5 mm (1.0 mm mode; 1.0 mm mean)
B	1.9-2.4 mm (2.1 mm mode; 2.1 mm mean)	0.9-2.2 mm (1.2 mm mode; 1.4 mm mean)
C	2.4-2.8 mm (2.5 mm mode; 2.6 mm mean)	1.2-2.8 mm (1.5 mm mode; 1.6 mm mean)
D	2.8-3.3 mm (3.2 mm mode; 3.0 mm mean)	1.6-3.2 mm (— mm mode; 2.3 mm mean)
E	3.3-4.0 mm (3.6 mm mode; 3.6 mm mean)	2.0-3.5 mm (— mm mode; 2.5 mm mean)

Table 4. Postulated Size Populations for the Drawn Tubular Beads (n = 35).

Size	Diameter	Length
A	1.4-2.3 mm (1.7 mm mode; 1.8 mm mean)	9.1-11.0 mm (10.4 mm mode; 10.2 mm mean)
B	1.7-2.9 mm (2.4 mm mode; 2.4 mm mean)	11.6-14.5 mm (14.0 mm mode; 13.1 mm mean)

Table 5. Postulated Size Populations for the Wound and Blown Beads.

Wound Oval Beads (n = 15)		
Size A	Diameter: 5.8-6.5 mm (6.1 mm mean)	Length: 6.0-7.5 mm (6.7 mm mean)
Free-blown Globular Beads (n = 22)		
Size A	Diameter: 8.0-9.8 mm (8.8 mm mean)	Length: 7.5-9.0 mm (8.3 mm mean)
Size B	Diameter: 12.3-13.4 mm (12.8 mm mean)	Length: 12.4-13.3 mm (12.8 mm mean)
Globular Bubble Blown in Tube (n = 9)		
Size A	Diameter: 6.7-7.0 mm (6.8 mm mean)	Length: 8.3-8.7 mm (8.5 mm mean)
Size B	Diameter: 8.8-10.7 mm (10.1 mm mean)	Length: 10.8-12.3 mm (11.5 mm mean)
Size C	Diameter: 11.9-14.0 mm (13.0 mm mean)	Length: 13.7-15.6 mm (14.6 mm mean)
Oval Bubble Blown in Tube (n = 22)		
Size A	Diameter: 3.9-4.2 mm (4.0 mm mean)	Length: 5.0-6.6 mm (6.0 mm mean)
Size B	Diameter: 5.1-6.5 mm (5.9 mm mean)	Length: 13.4-15.7 mm (14.3 mm mean)
Size C	Diameter: 8.1-10.6 mm (9.3 mm mean)	Length: 16.0- 21.1 mm (18.6 mm mean)
Size D	Diameter: 11.9-13.9 mm (13.2 mm mean)	Length: 23.0-31.5 mm (26.4 mm mean)
Constricted-Tube Barrel Beads (n = 69)		
Size A	Diameter: 4.0-6.0 mm (4.9 mm mean)	Length: 4.7-7.4 mm (6.3 mm mean)
Size B	Diameter: 6.4-8.1 mm (7.6 mm mean)	Length: 5.7-9.7 mm (8.7 mm mean)

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