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THE LEAVENWORTH SITE CEMETERY: ARCHAEOLOGY AND PHYSICAL ANTHROPOLOGY

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WITH AN APPENDIX ON DENTITION BY
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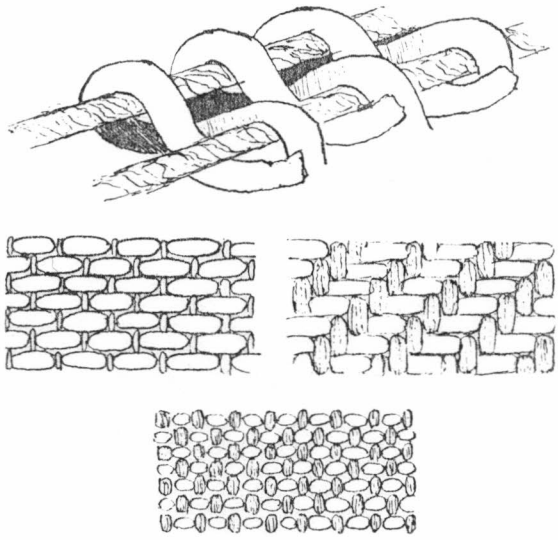


FIGURE 44
Illustration of weaving patterns of cloth.

facts, but present as a result of copper and brass artifacts in the graves, remnants of human hair and flesh are described with the perishable materials from the cemetery. Nine occurrences of identifiable human flesh and hair are present. Four instances of human flesh are identifiable as ears (No. 66). Another example includes the flesh and the cartilage of the upper thoracic region and the right arm (No. 33). Large brass spirals, placed around the neck of this burial, are probably responsible for the preservation of the flesh.

Six graves were located that contained human hair. Two graves (Nos. 194, 240) contained braided human hair. The other four graves (Nos. 33, 66-67, 113, 171) contained straight unbraided human hair.

Chiton. One specimen identified as chiton was found (No. 193).

Cloth. All cloth is of foreign origin and fabrication (Figs. 27 and 44, Plate X E). Color of the fabric upon excavation is probably not indicative of the original color. Among the nine occurrences, are three fragments of black wool adhering to the backs of brass buttons. One blue-green edging of a leather garment (No. 19) and one fragment of finely-woven tan cotton cloth (No. 153) are present. Five examples of brown and black woolen material are present. The weaves of these materials are presented in Figure 44.

INTRODUCTION TO THE DESCRIPTION OF EURO-AMERICAN GLASS BEADS

The most numerous artifact from the Leavenworth Cemetery is the glass bead. All but nine of the glass beads from the cemetery are of foreign origin and manufacture. The nine are probably a result of Arikara experiments in reproducing glass beads similar to those which they had received in trade. This is reasonable in light of the quantity of locally-fabricated triangular pendants, and associated waste products.

After excluding these nine specimens, there are 142,249 glass beads in the collection from the cemetery. Great effort was made to recover all the glass beads buried with the dead at the cemetery, although some were undoubtedly left behind. Recovery of all of the tiny glass beads from the gumbo soil at the site was difficult. Water screening was relatively effective, but quite time consuming. Larger beads were recovered with greater ease than short, cylindrical, beads (variously named "seed beads," "pound beads," etc.), although 138,713 of the latter were recovered.

Many researchers[*] have considered the problem of glass beads, their description, analysis, interpretation, and disposition in the past. Various publications describe large collections of glass beads, with varying degrees of attention devoted to precise provenience. The descriptions which follow may lack some features of comparability with those of other researchers, and may exhibit some invention on our part. They are, however, presented for their value in ordering a large quantity of material, with precise provenience, from an historically-dated site. Keys follow which show precisely what has and has not been done in ordering the glass beads and the reasons for the decisions that have been made.

Through discussions with others working with glass beads as well as from information found in the literature, a decision has been

[*] Since this was written a new classification has been developed by:

Kenneth E. and Martha Ann Kidd
1970 A Classification System of Glass Beads for the Use of Field Archaeologists. In Canadian Historic Sites: Occasional Papers in Archaeology and History—No. 1. National Historic Sites Service, Dept. of Indian Affairs and Northern Development, Ottawa.

TABLE 10. KEY TO DISCUSSION OF GLASS BEAD GROUPS

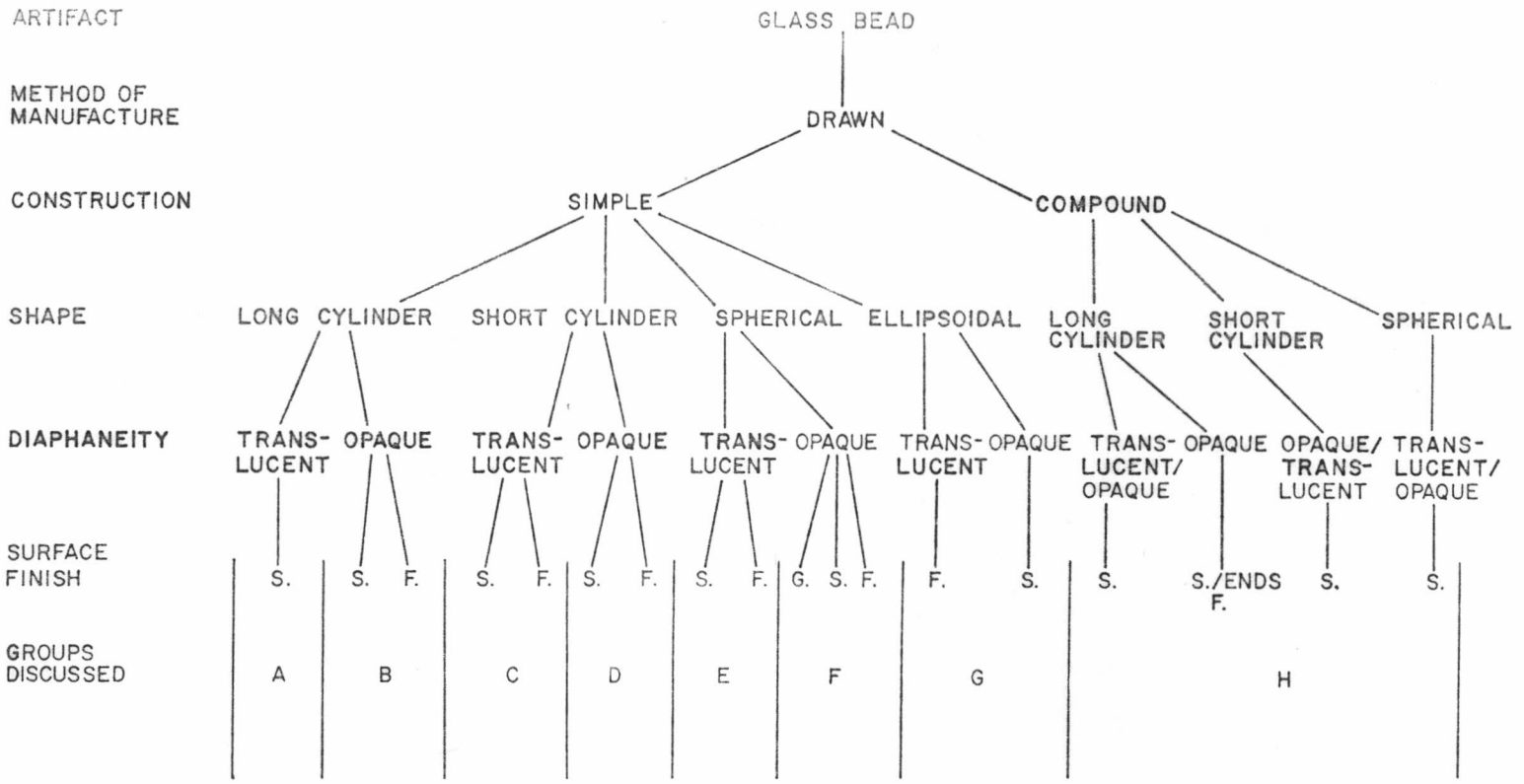
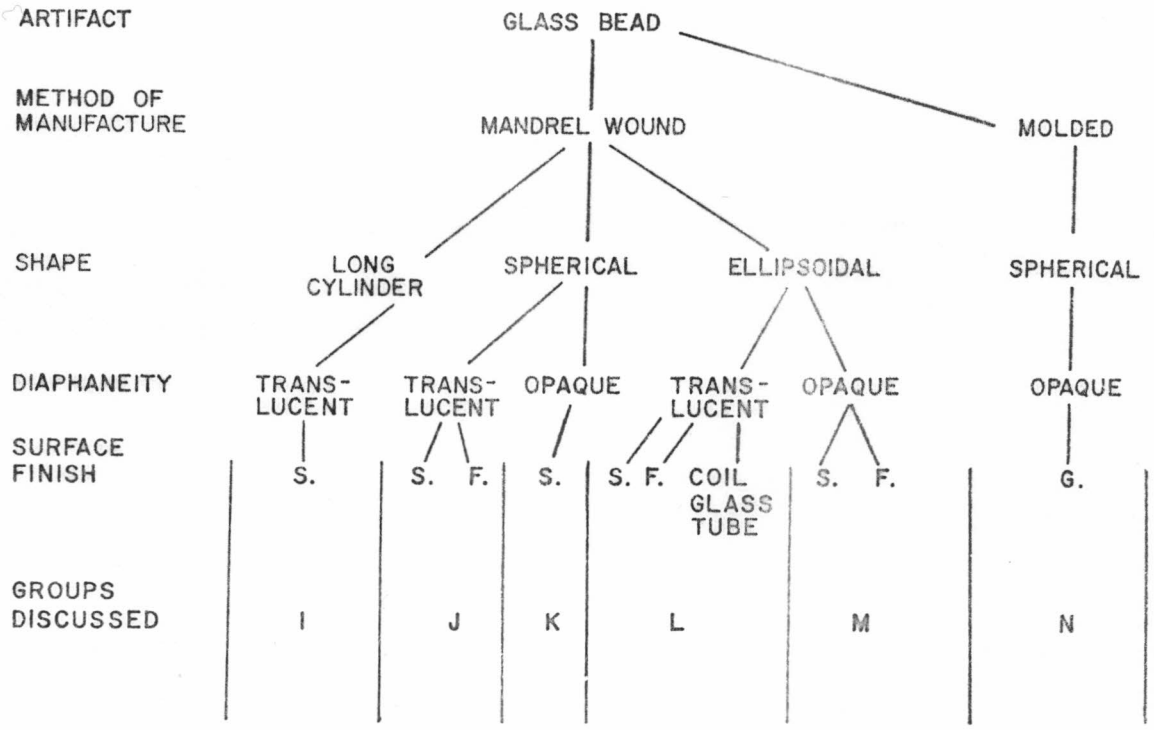


TABLE 10. (CONT.) KEY TO DISCUSSION OF GLASS BEAD GROUPS



SURFACE FINISH : S. = SMOOTH ; F. = FACETED ; G. = GROOVED

made that certain attributes of glass beads are more important than others. The method of bead construction is a major consideration, as are shape, surface finish, decoration, and color. The color of archaeological specimens may have changed because of burial. For this reason, color is probably the least dependable attribute. In classification it has been relegated to the final sorting criterion which determines the classes of beads (Tables 10, 11). It is useful to consider level of classification, grouping all beads of similar color together and establishing bead types without regard to color. This will be outlined below.

CLASSIFICATION SCHEME AND DEFINITIONS

A sample of glass beads as large as the one from the Leavenworth Cemetery must be sorted into meaningful groups. The following description of the groups, and criteria used for division into groups (A-N) is presented to explain the classificatory scheme.

Method of Manufacture. The results of three recognizable distinct methods of manufacture of Euro-American glass beads are in the Leavenworth collection. Included are drawn tube beads, mandrel wound beads, and molded beads. Drawn-tube beads are made by drawing molten glass into canes which are then broken into usable lengths and tumbled or fire polished. Spherical beads from Leavenworth were apparently fabricated by severe tumbling and fire polishing of drawn-tube beads.

Mandrel-wound beads are produced by wrapping or winding small canes of glass around a metal mandrel. Traces of the winding process are usually visible as spiral lines in

TABLE 11.—Key to occurrence and description of glass beads.

Method of Manufact.	*Construction*	*Shape*	*Diaphaneity*	*Surface Finish*	*Color*	*No.*	
Drawn	Simple	Long cylinder	Translucent	Smooth	Black/magenta (transmitted)	19	A
					Yale blue	12	
					American beauty red	5	
			Opaque	Smooth	Yale blue	42	B
					Peacock blue	6	
					Jade green	4	
					Black	98	
					White	249	
					Black/lemon yellow stripes	1	
				Faceted	Navy blue (pentagonal)	6	
		Short Cylinder	Translucent	Smooth	Peacock blue	4	C
					Yale blue	2	
					Black/magenta (transmitted)	2	
					Colorless-clear	26	
				Faceted	Black/magenta (transmitted)	3	
			Opaque	Smooth	Peacock blue	131,972	D
					Yale blue	272	
					Sky blue	586	
					Jade green	4	
					Dandelion yellow	34	
					Nickel gray	210	
					White	5,505	
					Black	60	
				Faceted	Black	5	
					Yale blue	3	
		Spherical	Transparent-Translucent	Smooth	Yale blue	284	E
					Peacock blue	8	
					Sky blue	4	
					Amber	133	
					Milky white	10	
					Clear	82	
Drawn	Simple	Spherical	Transparent-Translucent	Faceted	Navy blue	1	
					Yale blue	8	
					Emerald green	1	
					Clear-colorless	18	
			Opaque	Grooved	Robin's egg blue	2	F
				Smooth	Peacock blue	756	
					Jade green	3	
					Black	1	
					Yale blue/white + dandelion yellow dots	15	
					Black/white + pimento red and white and navy blue dots	3	
					White/salmon stripes	2	
					Milky white	1	
				Faceted	Navy blue	1	
		Ellipsoidal	Translucent	Faceted	Yale blue	5	G
					Emerald green	3	
					Amber	1	
			Opaque	Smooth	Peacock blue	2	
					White	2	

TABLE 11—(*Continued*)

Method of Manufact.	*Construction*	*Shape*	*Diaphaneity*	*Surface Finish*	*Color*	*No.*	
	Compound	Long Cylinder	Translucent/Opaque	Smooth	Red/white	30	H
			Opaque	Smooth/end faceted	Yale blue/white/henna red/white	9	H
		Short Cylinder	Opaque/Translucent	Smooth	Brick red/emerald green	14	H
					White/white	11	H
		Spherical	Translucent/Opaque	Smooth	Yale blue/white/brick red/sky blue	1	H
Mandrel Wound		Long Cylinder	Translucent	Smooth	American beauty red	1	I
		Spherical	Transparent-Translucent	Smooth	Yale blue	72	J
					Amber	39	J
					Magenta	1	J
					American beauty red	3	J
					Clear-colorless	37	J
				Faceted	Yale blue	24	J
					Amber	1	J
					Clear-colorless	2	J
			Opaque	Smooth	Peacock blue	110	K
					Jade green	11	K
					Cream yellow	8	K
					Black	59	K
					White	16	K
		Ellipsoidal	Translucent	Smooth	American beauty red	26	L
					Clear-colorless	1	L
					Yale blue	108	L
				Faceted	American beauty red	23	L
				Coiled glass tube	Blue-green	13	L
			Opaque	Smooth	Peacock blue	44	M
					Yale blue	21	M
					Sky blue	2	M
					Robin's egg blue	2	M
					Jade green	186	M
					Surf green	23	M
					White	625	M
					Heliotrope	166	M
					Dark shade dandelion yellow	21	M
					Black	17	M
Mandrel Wound		Ellipsoidal	Opaque	Smooth	White/delft blue floral pattern	3	M
					Black/gold spiral + white dots	1	M
					Robin's egg blue/red + gold spiral	10	M
				Faceted	White	29	M
					Robin's egg blue	1	M
Molded		Spherical	Opaque	Grooved	White	2	M
						142,249	

the internal structure of the beads. The usual shape of mandrel-wound beads is ellipsoidal, although spherical beads and even one long cylindrical bead are present.

Molded beads are rare in the Leavenworth collection, and the specimens present (2) suggest enclosure of molten glass in a two-piece mold. More complete descriptions of manufacturing techniques are available in several publications (Van der Sleen 1967:22-7); Harris and Harris 196:134-8).

Type of Construction. For the drawn beads, construction is noted as simple or compound, depending on the number of layers of glass present. Simple beads are composed of only one layer of glass, while compound drawn beads are composed of more than one layer of glass. Differing from Duffield and Jelks (1961:41), "complex" beads have not been separated from compound beads. Using a system developed by Duffield and Jelks (1961:41), the colors of multilayered beads are noted from the outside of the bead to the inside (i.e., a bead with a white center and a red outer layer is noted as red/white).

Shape. The shapes of beads from the Leavenworth Cemetery fall generally into the following classes: long cylinder; short cylinder; spherical; ellipsoidal. Long cylindrical beads have a length greater than the diameter; short, cylindrical beads have a length equal to or less than the diameter. The class of spherical beads also includes some subspherical beads which could be described as doughnut-shaped or even asymmetrical tear-drop shaped. Ellipsoidal beads include football-shaped or barrel-shaped beads, most commonly mandrel wound, but also produced by drawing. Some opaque, white, ellipsoidal beads have fractured perpendicular to the long axis, producing half of an ellipsoid; these have been included with the ellipsoidal beads.

The ends of many beads are irregular because of tumbling and reheating. These irregularities have been disregarded in the general shape classification.

Diaphaneity. The degree of light transmittal has been noted and the beads grouped generally into two categories: those that do transmit light (transparent-translucent), and those which do not transmit light (opaque). The degree of diaphaneity within some groups of beads is consistent, while variation is present in other groups. If beads transmit light they have been grouped as translucent.

Surface Finish. Surface finish of the beads includes three categories: smooth, faceted or grooved. In only one instance (the "Chevron" bead) is there a combination of a smooth, long cylindrical bead type and faceted ends. Facets are both pressed and cut. Generally, pressed facets are not as finely executed as the cut facets. A grooved surface finish is the result of a cane of glass being drawn through a template, so far as can be determined. Smooth beads show no modification of the original shape of the bead.

Color. The color of the beads has been determined by comparison with a standard color chart (Bustonby 1947:28-9). Because of changes in color of specimens from archaeological contexts, complete reliability of color designations is lacking. In the process of color determination each bead was moistened and viewed under an incandescent light. Differences between such colors as peacock blue and Yale blue are marked. Subtle differences in color have not been taken into consideration, because of the archaeological nature of the collection.

GLASS ARTIFACTS

Simple (Drawn) Beads

Long Cylindrical Beads Translucent (A) (36 specimens). Drawn, simple, long, cylindrical, translucent, smooth beads occur in three colors: black/magenta (transmitted light), American beauty red, and Yale blue. These cylindrical beads range in diameter from 3 to 10 mm.; the black and blue specimens are all between 3 and 4 mm. in diameter, while the red specimen is 10 mm. in diameter. The ends of the beads are fire polished, a process which has rounded the sharp edges of the glass cylinders. (Plate XII A-B).

Opaque (B) (406 specimens). Drawn, simple, long, cylindrical, opaque beads are found in both smooth and faceted varieties. Smooth varieties of this opaque bead are found in Yale blue, peacock blue, jade green, white, black and black with lemon-yellow wavy stripes running perpendicular to the long axis of the bead at each end of the cylinder. The faceted variety is large, pentagonal in cross section and navy blue in color. The facets are

pressed and irregular in size. Smooth varieties range from 3 to 6 mm. in diameter and from 5 to 53 mm. in length. The smooth Yale blue, peacock blue, and jade green specimens occur only in the 6 mm. diameter size while the white and black specimens occur in both 3 and 6 mm. diameters. The navy blue faceted specimens range in maximum diameter from 12 to 15 mm. and are up to 25 mm. long (Plate XII C-F).

Short Cylindrical Beads Translucent (C) (37 specimens). Drawn, simple, short, cylindrical, translucent beads occur in both smooth and faceted forms (Plate XII G-H). Smooth specimens occur in four color groups: peacock blue, Yale blue, black/magenta (transmitted light) and colorless. Translucent faceted beads are all black/magenta (transmitted light). These beads, often called "seed beads" or "pound beads," range in diameter from 1 to 4 mm. In no instance is the length greater than the diameter. The beads show tumble polishing on broken ends in all cases. Faceted specimens are not uniformly faceted. The facets may be pressed, but they are quite distinct.

Opaque (D) (138,651 specimens). Drawn, simple, short, cylindrical, opaque beads are also found in smooth and faceted varieties (Plate XII I). Seven colors of smooth opaque beads occur: peacock blue, Yale blue, sky blue, jade green, dandelion yellow, nickel gray, white and black. Only black and Yale-blue faceted specimens occur. These beads, similar to the translucent varieties in all respects, range in diameter from 1 to 4 mm., and in no case is the length greater than the diameter. Peacock blue specimens of this class are the most numerous type of bead in the collection (131,792). Most of the specimens are 2-3 mm. in diameter.

Spherical Beads Translucent (E) (549 specimens). Drawn, simple, spherical, translucent beads occur in both smooth and faceted varieties. The smooth specimens occur in the following colors: Yale blue, peacock blue, sky blue, amber, milky white, and clear-colorless (Plate XII J). Faceted specimens occur in navy blue, Yale blue, emerald green, and clear-colorless (Plate XII K). The smooth beads range in diameter from 5 to 7 mm. Surfaces are glossy, and the beads have been heavily fire polished. Faceted specimens are multi-faceted, with the facets seemingly cut rather than pressed. An exception is a larger Yale blue specimen. The faceted specimens occur in three sizes: 5, 6 and 7 mm. in diameter.

Opaque (F) (784 specimens). Drawn, simple, spherical, opaque beads are present in smooth, faceted and grooved varieties (Plate XII L-P). Smooth specimens occur in the following colors: peacock blue, Yale blue, jade green, milky white and black. A Yale blue and several black specimens are decorated. The Yale blue bead is decorated with white and dandelion yellow dots spaced around the circumference of the bead in three rows perpendicular to the perforation. Some of the black specimens are decorated with similar dots arranged in rows, but the dots are white and pimento red at the center of the bead. In rows above and below the center the dots are white and navy blue. Individual dots are bicolor, either white and yellow or white and blue occurring in the same dot (Plate XII N).

The one faceted specimen is navy blue and similar in all respects to the faceted translucent specimens described above (E), but made of opaque glass (Plate XII O). The grooved specimen is made of robin's egg blue glass, and appears to have been drawn through a grooved template as the glass cane was stretched. The bead was then fire polished (Plate XII P). Smooth varieties occur in four general size ranges: approximately 5, 7, 10 and 15 mm. in diameter. The faceted specimen is 6 mm. in diameter, while the grooved specimens are 5 mm. in diameter.

Ellipsoidal Beads Translucent and Opaque Beads (G) (13 specimens). Drawn, simple, ellipsoidal, translucent and opaque beads are rare. These translucent beads occur only as faceted specimens: Yale blue, emerald green, and amber (Plate XII Q-R). Opaque beads occur only as smooth specimens and are peacock-blue and white in color. The translucent ellipsoidal specimens are 5 to 6 mm. in diameter and 11 to 15 mm. long; the shortest translucent bead is amber, while the longest is Yale blue. These beads are similar to the faceted varieties described above in (E), except they are ellipsoidal rather than spherical in shape.

The opaque specimens are somewhat irregular in outline, most closely resembling an ellipsoid (Plate XII R). The peacock-blue bead

is approximately 9 mm. in diameter and 21 mm. long, while the white variety is 10 mm. in diameter and 13 mm. long.

Compound (Drawn) Beads

Compound Beads (H) (68 specimens). Drawn, compound, beads are rare and occur as long cylinders, short cylinders, and spheres. The long cylindrical specimens are multilayered. One is translucent red over opaque white, and measures 8 mm. in diameter and 10 mm. in length. The other long, cylindrical compound bead is opaque with four layers of glass: Yale blue over white over henna red over white (Plate XII S). This bead is smooth and has six coarse facets at each end. This is the "Chevron" bead mentioned above. The short cylindrical beads have a layer of opaque brick red glass over a translucent emerald green center (Plate XII T). The beads occur in two sizes, one 5 mm. in diameter and the other 2 mm. This is the bead type identified as "Cornalene d' Allepo," popular as a trade bead. The other short, cylindrical bead is a two-layered white on white bead. The outer layer is translucent white, while the center is opaque white. It measures 7 mm. in diameter.

The spherical bead of compound construction is a "Star" bead made of four layers of glass. The outer Yale blue layer is translucent, while the other three layers are all opaque. The bead is layered Yale blue over white over brick red over sky blue. It is 11 mm. in diameter (Plate XII U).

Mandrel-Wound Beads

Long, Cylindrical Beads (I) (1 specimen). Mandrel-wound, long, cylindrical, translucent beads occur with smooth surface finishes. They are American beauty red in color and approximately 7 mm. in diameter and 10 mm. long. They closely resemble the long, cylindrical, compound beads described above (H), but lack the white glass center and are mandrel wound (Plate XII V).

Spherical, Mandrel-Wound Beads Translucent (J) (179 specimens). Mandrel-wound, spherical, translucent beads occur in both smooth and faceted forms. The smooth forms occur in Yale blue, amber, magenta, American beauty red, and clear-colorless (Plate XII X), while the faceted forms occur in Yale blue, amber, and clear-colorless (Plate XII Y). The Yale blue varieties occur in sizes ranging from 5 to 19 mm. in diameter. Most specimens range from 5 to 8 mm. Beads of the other colors range in diameter from 5 to 10 mm. The faceted varieties are irregularly faceted, with only a few pressed facets on each specimen. The maximum number of facets on any one specimen is five.

Spherical, Mandrel-Wound Beads Opaque (K) (204 specimens). Mandrel-wound, spherical, opaque beads occur in smooth forms, with peacock blue, jade green, cream-yellow, black, and white forms present (Plate XII W). The beads range in diameter from 5 to 16 mm. White and peacock-blue beads occur in the 5 mm. size range. The peacock-blue are larger spherical beads (16 mm.). Most specimens are approximately 8 mm. in diameter. The greatest variety of sizes occurs among the peacock blue specimens. Surfaces of these specimens range from glossy to dull, probably a result of burial in the earth.

Ellipsoidal Mandrel-Wound Beads Translucent (L) (171 specimens). Mandrel-wound, ellipsoidal, translucent, smooth, faceted and coiled glass-tube beads are present. Mandrel winding of glass produces an ellipsoidal glass bead. Thus, the number of varieties of ellipsoidal mandrel-wound beads is large. The translucent smooth varieties occur in American beauty red, Yale blue, and clear-colorless colors. The only faceted, translucent, ellipsoidal bead is American beauty red (Plate XII a). The facets are coarse and pressed, four on each half of the bead. The smooth beads range in diameter from 3 to 15 mm.; the largest is clear-colorless, while the smallest is red (Plate XII Z). Specimens made of coiled, hollow, glass tubing wound around a mandrel to produce an ellipsoidal bead are blue-green in color and translucent (Plate XII i). The beads consist of six coils of 2 mm. glass tube. The resultant beads are approximately 8 mm. in diameter and 10 mm. long.

Opaque (M) (1151 specimens). Mandrel-wound, ellipsoidal, opaque beads occur in both smooth and faceted forms. Some of the smooth forms are decorated with spiral lines, dots, and floral patterns (Plate XII b-h). More individuality occurs within this class of bead

than in any of the others. This is probably because the beads were created one at a time. Smooth forms occur in the following colors: peacock blue, Yale blue, sky blue, robin's egg blue, jade green, surf green, white, heliotrope, dark-shade dandelion yellow, and black. Three varieties of decorated ellipsoidal beads occur. They are (1) white with Delft-blue floral patterns, (2) black with a gold spiral line with white dots between the spirals and (3) robin's egg blue with red and gold spiral, inset lines. The red and gold lines appear to be canes of glass inset into the blue base after the red and gold canes had been twisted together. An alternating red-gold pattern in spirals was produced. Faceted beads occur in robin's egg blue and white with pressed facets (Plate XII j).

Molded Beads

Spherical Molded (N) (2 specimens). Molded, spherical, opaque, grooved, white beads occur. The mold line around the center is quite obvious. The beads are 13 mm. in diameter and are spherical with molded grooves (Plate XII k).

Pendants, Local Manufacture (36 specimens). Thirty-six locally-made glass pendants are present. These objects of blue glass are plano-convex in cross section, opaque, perforated, and 12 of the 36 are decorated (Plate XIII). The measurements of the specimens are presented in Table 12. The quality of the glass and the color differs from one specimen to another, yet an analysis (Walter E. Hill, Jr., Personal Communication: 1965) shows that the composition of the glass is identical to that of the blue, short, tubular beads traded to the Arikara. The Arikara apparently melted prepared glass beads on a flat surface, such as a brass buttplate or copper sheet, until the mass fused to form the roughly triangular pendants. Ubelaker and Bass, (MS.), discuss the ethnographic evidence for the suggestion that Arikara made the pendants.

The decoration of the pendants is exclusively in white. Some specimens show a bullseye design of white dots with red centers. The dots are about the size of the short, tubular, white, glass beads from the cemetery. Other design motifs include parallel, horizontal, white lines alone or accompanied by white dots with red centers, equal arm crosses, short curvate lines, and one example of an animal representation. One circular glass object, which appears to have a bullseye decorative motif of white circles on blue was found. The fragment (Nos. 100-103; Plate XIII i) measures 20 mm. by 12 mm. and is 4 mm. thick. It resembles specimens illustrated by Wedel (1955; Plate 68b), which were more commonly found in Stirling's excavations than the ones described herein. Eighteen of the 35 occurrences were associated with the skulls or chests of skeletons, while 10 of the 35 are of undetermined association.

Perforations are consistently at the apex of the triangular pendants. Some specimens show a buildup of glass around the perforation. This suggests that a stick or some other object was placed through the glass as the object was fired.

Experiments by Ubelaker and Bass (MS.) suggest that the pendants may have been made by placing glass beads on a metal plate and then heating them. This procedure was followed in the laboratory production of facsimile specimens from short, tubular, glass beads. Statements in Denig (1930:413), Grinnel (1924:223), and Thwaites (1904:272-4) or Gilmore (1924:21) that molds of clay were used should not be disregarded, however. Although the molds were not necessarily fired, they could have been used to model the glass into the triangular shape of the finished object. Unless fired, such molds would not survive burial.

Animal Effigy, Glass (1 specimen). One animal effigy of glass is present in the collection from the cemetery. It is made of white, opaque glass and has a faded blue decoration. It is a four-legged, tailed animal. It is executed in the same manner as the glass pendants, and is plano-convex in cross section. It is 81 mm. long with a maximum width at the hind legs of 43 mm. It is 3-7 mm. thick (No. 77; Plate XI M). Blue decorations on the white effigy include four chevrons on the back, one chevron on each leg, and four horizontal bands —three at the neck and one at the base of the tail. Dots represent the eyes of the effigy; there are also three dots on the tail, and 29 additional dots placed randomly over the remainder of the animal. Groups of three dots at

the end of each leg, possibly represent toes. All the decorations are patinated and faded. Ubelaker and Bass (MS.) suggest that the effigy may represent a mammal pelt or possibly a lizard-like animal. It is also possible that the decorations may be an attempt to represent a skeleton, possibly that portion of an animal remaining after the pelt has been removed.

Beads, Glass, Local Manufacture (9 specimens). The nine specimens are all from the same grave. The beads are ellipsoidal, with coarse white and blue decorations in a dark, burned, blue base material. The specimens (No. 12) are similar to spherical Euro-American trade beads with decorations of lines and dots, but are more crudely executed. The lengths range from 11 to 17 mm. and the diameters range from 9 to 12 mm (Plate XII l-s).

TABLE 12.—Provenience and measurement of locally made glass pendants.

Provenience	Dimensions (mm)	Weight (gms)	Decoration
F101 B13B	33x23x5	3.93	
B13B	35x22x5	5.21	dog motif (white)
B14	39x30x7	9.13	
B15	25x20x6	2.90	
B15	24x20x6	2.79	
B21A&B	27x17x4	2.49	lines and dots (white)
B25	34x24x5	4.66	lines and dots (9) (white)
B32	33x26x7	6.57	
B32	30x22x7	5.50	
B32	29x23x6	5.05	
B45	35x25x6	6.39	
B59	20x18x4	1.63	
B66	32x22x7	5.66	
B69	26x19x4	2.51	
F102 B3D	32x22x7	5.29	
B5	20x12x4	1.63	circle (?-white)
B17	39x23x6	7.14	
B18D	29x26x5	5.39	lines (2-chevrons)
B20	37x26x6	6.34	line chevron, cross, (white)
B20	35x26x6	6.21	line chevron, cross, (white)
B29	32x24x8	6.70	
F201 B3	29x23x6	4.16	dots (4) (white-red center)
B3	28x21x5	3.92	dots (5) (white-red center)
B3	26x21x5	3.41	dots (5) (white-red center)
B3	28x23x5	3.85	dots (5) (white-red center)
F202 B3	35x23x4	3.86	
B3	32x20x5	3.90	
B4	38x24x7	9.90	
B4	31x22x6	6.04	
B10A	33x23x6	5.79	
F203 B4	37x26x7	7.45	
B6	14x12x4	0.92	
B17B	31x24x3	3.11	
B17B	29x22x7	4.03	dots (4) (white-red center)
B30	34x28x5	5.94	
SURFACE	39x27x8	10.57	

Waste Products of Aboriginal Glass-Working (11 specimens). In addition to fragments of glass pendants, produced by the Arikara, there are 11 irregular items made of glass. Four are roughly circular with ground edges and smooth, flat surfaces (Plate XI P). These lozenge-shaped objects could be remnants of broken pendants which the Indians attempted to salvage. The specimens could also have functioned as buttons. There is little supporting evidence for this supposition, except the presence of brass buttons and remnants of button holes in clothing which demonstrate that the Arikara knew of buttons and button holes. Circular glass objects, found by Stirling (Wedel 1955, Plate 68b), which are perforated in the center, also indicate the use of buttons. One of the lozenge-shaped specimens is layered with black and blue glass in a fashion similar to modern, layered, cold tablets. There are, in addition to the semi-symmetrical specimens, eight rounded pieces of glass, which may have cooled as droplet-shaped masses, and could have been waste materials, which fused in the fire quite by accident. Four of the blebs of glass are striped black and white, in irregular chevron designs. All four are identical, appear to be of the same composition, were probably melted at the same time, and occurred in the same grave (Nos. 111, 112) inside a leather pouch. The other specimens are blue in color and similar in texture to the symmetrical, blue glass pendants. Two specimens of fused glass, attached to metal plates are present. These are additional evidence of the means and method of molding and heating the pendants (Nos. 41, 77, Plate XIV T).

Glass, Window and Bottle (3 specimens). Three broken glass specimens, either window or bottle glass, were found. Two specimens (Nos. 28, 29, 61) are window glass 2 mm. thick (No. 61). Both lack evidence of silvering as would be expected on a mirror. The first (No. 61) is inlayed in a wooden frame and was used as a pendant; one end of the wooden frame is