A CLASSIFICATION SYSTEM FOR GLASS BEADS FOR THE USE OF FIELD ARCHAEOLOGISTS[1]

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As a result of examination of numerous collections of glass beads in northeastern North America and elsewhere, and as a result of a study of the procedures used in their manufacture, the authors propose a classification and nomenclature which they hope will permit exact descriptions and a reference base for all beads found in archaeological excavations. New bead types may be added to the system which is expansible to accommodate all possible variations.

PREFACE

Archaeologists working on sites occupied after the arrival of Europeans in northeastern North America, and indeed in other parts of the continent, frequently encounter glass beads. Describing these beads has proven to be frustrating for most archaeologists, involving the making of fine distinctions as to colour, size, shape, and other characteristics between many similar specimens. To date, there has been no completely satisfactory frame of reference, such as has been available in other branches of archaeology; e.g., ceramics. Many classification systems have been set up, but none has proven very useful under field or laboratory conditions, and none has found wide acceptance – a necessary factor if there is to be ready comparison of finds from different sites. It is with some temerity, therefore, that the authors venture to submit one more system of classification to the archaeological community. They do so in the hope that it may be of practical use to those who feel the need of a new system.

THE TECHNOLOGY OF GLASS BEADS

This paper is part of a much more comprehensive investigation on the study of glass beads used for trade with the Indians of northeastern North America. Basic to such a study is the need for a satisfactory terminology and the authors, not finding one ready at hand, decided to try to work one out. After accomplishing this to their satisfaction, they decided not to await the publication of the larger work, but to make the results available to any who might wish to use it. It should be stressed, however, that our firsthand knowledge has been confined largely to specimens from the Northeast, and while the classification scheme should be of worldwide application, our specific knowledge does not extend to all of North America, and there may be many types which we have not seen.

There have always been, of course, terms by which the different kinds of beads have been known and identified. Some of them have referred, however vaguely, to physical characteristics; in this category we would place such terms as "pound," "seed," and "tube." Others, derived from sources now often obscure, are "macca," "cornaline," and "rosetta." None of these has any precise significance, and although they may be useful in the trade, are of no assistance to the archaeologist. The use of such terms as "pony" and "Russian" beads, seemingly not used extensively by dealers but rather by the consumer and by students, are equally valueless. In the Old World, individual types of beads were often called by specific names, but these likewise have no classificatory use. Within the present century, several systems have been devised for bead classification, but so far as the authors are aware, none will permit the identification of each and every glass bead known. The one proposed here will, it is hoped, make good that deficiency, or at least pave the way. It is based on the first-hand study of approximately 500 different types, and has been designed to be infinitely extensible.

This classification is based, in the first instance, upon the processes of manufacture; in the second, upon such physical characteristics as shape, size, and colour (including translucency and opacity). The last class of attributes encompasses verifiable entities, for it is possible to subject any given specimen to an examination with regard to them, and to compare said specimen with any other bead with respect to each. Processes of manufacture can also be determined by inspection. It should not be inferred from

these remarks that the authors imply any sort of evolutionary development in the making of beads, but it is difficult, nevertheless, to see how some of the procedures used could have come into being except through some developmental process such as is outlined below.

The manufacture of glass beads will be discussed more fully in the book which is in preparation:[2] but in order to understand the function of the classificatory system under discussion, it is necessary to have at least some understanding of how beads are made. To this end, the following extremely brief and condensed synopsis of the various processes is given.

Glass, a complicated substance made from silica, an alkali, a stabilizer, and (usually) a colouring agent, is molten when raised to a high temperature, and solid at room temperature. In the molten state it is highly ductile, and while cooling can be manipulated into a vast variety of forms by using appropriate techniques. Beads may be made by two principle methods: (1) by drawing out a bubble of molten or viscid glass into a long, slender tube, and (2) by winding threads of molten glass around a wire which is later withdrawn. A third method, probably often used in conjunction with each of the above, is by molding the beads in two-part molds while the glass is still viscid.[3]

The first method of bead manufacture requires the services of two men (Figure 1). The first man gathers up a small amount of molten glass on the end of his blowing rod and by blowing into the rod enlarges it to a bubble. He then puts the bubble into the mass of molten glass to gather up more material. At this time, he may either add more glass of the same colour or glass of a different colour from another pot. If a different colour is added, the process is called "layering." Two or more colours may be used, and even five or six layers of different colours are not uncommon. If a simple round tube is required, the second man attaches another iron rod to the far end of the glass bubble, the blower hands his end to a servant and both these men then move in opposite directions until the glass becomes cool and will not pull out further. (In practice, neither of the runners, or *tiradors,* is the same man as he who withdraws the glass from the furnace and blows it.) The now rigid tube of glass is laid down on slabs of wood to cool. When it has cooled sufficiently, it is broken up into short lengths, and these are finally chopped into sizes which will serve as beads. It is necessary to note that during the process of drawing, the proportions at any given point along the length of the tube remain constant. This means that the bore is almost uniform throughout, but it becomes smaller and smaller the more slender the tube becomes. We now have cylindrical beads either of monochrome or polychrome glass, depending upon whether one or more layers have been given to the bubble.

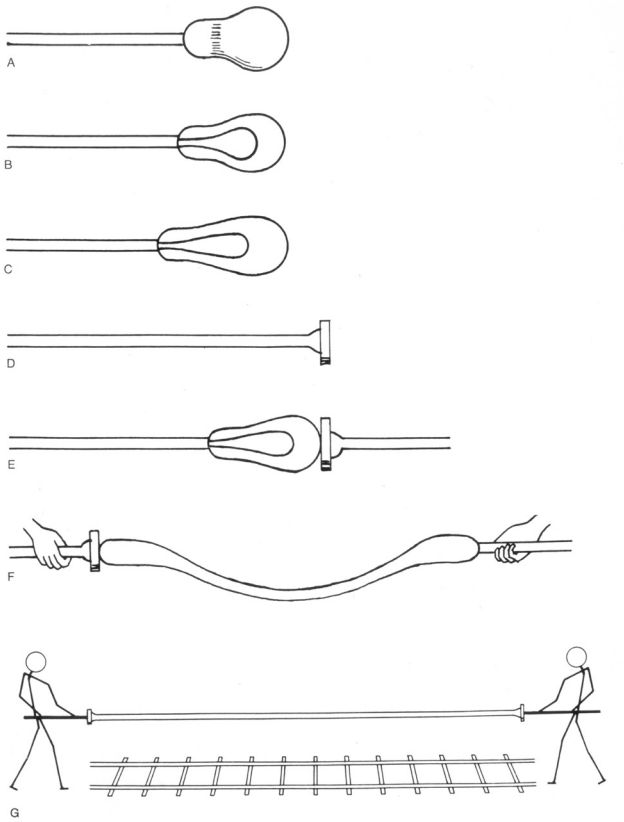

Figure 1. Drawing a tube for glass beads.

Other treatments than that described above may be given to the bubble. The first of these is the so-called inlay treatment, where "canes" or rods of coloured glass are affixed to it, ultimately producing striped beads. In this process, rods of the required colour are ranged around the inside wall of a pail-like container (Figure 2). These rods may be themselves either simple or multiple. The bubble is introduced into the centre of the bucket and expanded sufficiently to cause the rods to adhere, whereupon it is re-introduced to the furnace just long enough to cause the rods to coalesce with the surface of the bubble, but not to lose their form. The bubble is then drawn as described above and the resulting tube bears the diminutive remains of the rods on its surface.

Another treatment may be given on the "marver," or board. The bubble, whether it is layered, unlayered, striped, or a combination of these, is laid on the marver, and either flattened slightly, or paddled to make it triangular, square, or some other shape in cross-section. If a corrugated marver is used, the bubble is rolled over it to press the corrugations into the sides. The bubble is then drawn in the usual way, and the finished tube will retain the shape, though not the dimensions given it on the marver. (Generally, when the bubble is rolled on the corrugated marver, it is layered in

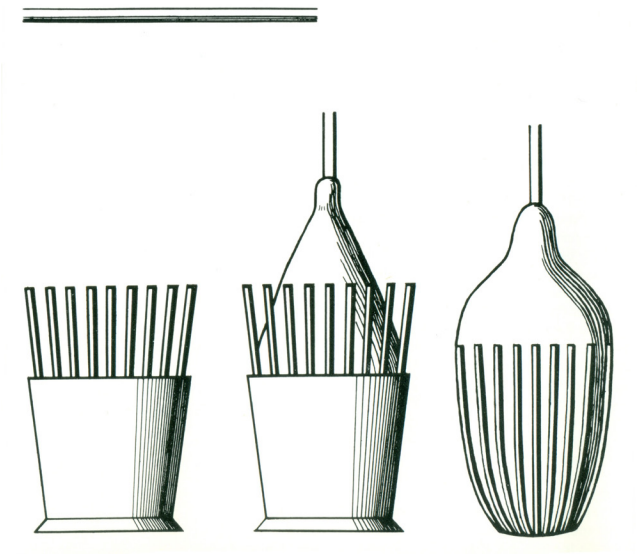

Figure 2. Inlay treatment for glass beads.

glass of another colour, and the process is repeated until five or six layers, and in some cases up to twelve, have been built up before it is drawn. The resulting bead is the so-called rosetta, star, or chevron.)

While the tube is being drawn, it may also be twisted. This applies not only to simple monochrome tubes drawn from the bubble as blown, but to layered, inset, and marvered beads as well; thus it is possible, and indeed it happens, that one finds such complicated forms as beads which have been layered, striped, squared in section, and twisted.

Some beads, especially large ones, like big chevrons, are often ground at the ends and for a short distance along the sides in order to bring out the colour effects in the layering. Most, however, are not given this rather costly treatment.

Imperfectly shaped beads are not uncommon on Indian sites, and their classification poses a slight problem. Even twinned beads sometimes occur. Generally the intended form is easy to see and they are classified accordingly. It would appear that the Indians were not very critical: in fact, one gets the impression that they actually preferred these eccentric specimens.

The diameter of the finished product will depend entirely on the extent to which the bubble has been elongated; it may vary from an eighth of an inch or less to an inch or even more. When the tubes have cooled, they are broken into long pieces which can later be chopped on a block to the desired length; that is, anywhere from a sixteenth of an inch or thereabouts to three or four inches. They may either be left in this condition, or they may be subjected to further treatment to reduce them to oval or rounded beads.

To effect this shaping, a mixture of ground charcoal and fine sand is worked into the orifices of the beads, and the whole is then placed in a metal container and re-subjected to heat. In order to keep the beads from fusing together while in this heated condition, the container is constantly agitated on an eccentric axle.

This action, in conjunction with the heat, reduces the beads to a round shape, while the mixture of sand and charcoal prevents them from sticking together and the orifices from disappearing. When cool, the beads are separated from the mixture, washed, and then agitated for some time in bags of bran to produce a polished surface.

Whether left in tube form or made into round beads, the finished products are sorted, first on a set of sieves of graded sizes, and finally by hand, during which defective examples are removed. They are then strung into hanks, but nowadays this is less often done than packaging in bulk, in which form they are ready for shipment.

Whereas tube beads are mass produced in the sense that thousands may be made from a single bubble or gathering of glass (which, however, is individually fabricated), wire-wound[4] beads are made one by one. Wire which has been covered with chalk, or some similar substance to facilitate removal of the final product, is heated at a flame (originally fed by whale oil) and at the same time a cane or solid rod of glass, about as thick as a lead pencil, is heated and a thread started from it. This thread or strand of molten glass, which may be of any colour, is wound around the wire until a bead of the desired size and shape is built up. Indeed, threads of different colours may be introduced to make multicoloured beads; and glass insets of various kinds, such as simple dots, rosettes, or flowers, may be set into the matrix while it is still soft. Such beads, often called *suppialume,* are capable of almost infinite variation and attempts to classify them are consequently no more successful than other individually made, handcrafted products.

Although little is known of the process, it is quite apparent that in the past some beads were molded, and it seems safe to assume that this was accomplished in conjunction with the processes outlined above for the making of both tube and wire-wound beads. Certainly there are many examples of beads which have been pinched in two-part molds; the so-called “raspberries,” “melons,” and facetted types being examples of such molded beads.

There is no problem, obviously, in determining when a bead has been molded, but it is not always quite so easy to decide whether a given specimen has been produced by the drawing method or by wire winding. Close inspection with a hand lens will usually reveal this, however, for in the former,

the fibres of glass are arranged side by side longitudinally. This is often more clearly shown in tubular beads which have lain in the soil long enough to disintegrate slightly, at which stage the fibres show up quite clearly. In wire-wound beads the fibres are arranged in heliacal fashion, round and round the circumference of the specimen. Such an arrangement is often obvious in the so-called milk-glass beads. But perhaps of even greater help in deciding the method of manufacture is the presence of small air bubbles. In both processes, these tiny inclusions of air are bound to occur, and it is seldom that inspection will fail to reveal them. In the case of tube beads, little bubbles, like the fibres of glass, have been drawn out into long, thin shapes, a sure indication of the method used to make them. Just as certainly in the case of wire-wound beads, the bubbles are either globular or oval and never elongated.

During the 17th, 18th, and 19th centuries, the control of the ingredients was a somewhat haphazard affair for the exact science of chemistry had not yet arisen. The materials which went into the manufacture of glass depended on many variables, but chiefly upon the judgement of the man in charge. It is true that the proportions of the various ingredients which made glass of certain qualities was recognized and followed; but it is equally true that they were not accurately controlled. (A modern analogy would be with a cook who does not follow her recipe exactly in making a cake, but uses her experience and judgement.) Furthermore, the ingredients which went into the glass batch were not chemically pure resulting in considerable variation in the quality of the finished product, some being less stable than others, and so on.

This matter of chemical variation is especially important with regard to colour. It was well understood that certain materials, like copper salts, would produce specific colours; and this knowledge was fully utilized and expanded with increasing experience. But again the colouring chemical was not pure, and slight variations in colour inevitably resulted. Furthermore, the resulting colour could be affected by the nature of the batch into which the chemical was introduced; and if the batch were not uniform in all cases, colour variations could result no matter how pure the pigments were nor how accurately they were measured. All told, therefore, there is room for considerable variation in colour, and 18th-century and earlier beads differ considerably in this regard from those made in the 19th and 20th centuries when strict standarization became the rule. In brief, one cannot expect to find consistency of colouring in these early beads; but on the other hand, one does find a rainbow range of beautiful soft colours, very different from the harsh, strident ones so frequently encountered in the modern product.

DESCRIPTION OF A CLASSIFICATION SYSTEM FOR GLASS BEADS

The Tube Bead Chart

The chart (Figure 3) illustrating tube beads is divided into four quadrants. Contiguous quadrants can be described as units in themselves but this cannot be done with non-contiguous quadrants. The beads in the lower quadrants (I and III) are all basically tube forms; those in the upper quadrants (II and IV) have been modified to a round form by reheating. Furthermore, the beads in quadrants I and II are "simple beads;" that is, they are basically monochrome but may have adventitious surface decoration; but those in the two left hand quadrants (II and IV) repeat the classes covered in I and II but are layered, and may therefore be regarded as compound and not simple. The one exception is the class of star beads which is not duplicated in the right quadrant. The chart is not strictly symmetrical because types corresponding to some that appear are hardly conceivable. For instance, there are innumerable beads of the types Id and Id', but their counterparts in quadrant II do not seem possible. The same is true for quadrants III and IV, but the numbers are available for use if the need should arise. All the beads assigned to a quadrant bear the designator for that quadrant (i.e., I, II, III, IV).

It cannot be emphasized too strongly that this chart shows only the most elementary of the possible forms. Examination of the plates will reveal something of the degree of possible elaboration of these basic types.

[Editor's note: the color notation and abbreviations used in the tables that follow are explained in Tables 1-2.]

Class I

All the beads in quadrant I are designated as Tube Beads, Class I (Table 3). They are simple monochromes with, in some cases, adventitious surface decoration. Bead Ia is the simplest possible monochrome tube. Bead Ib is made by adding simple or compound stripes of a different colour before drawing to a gathering similar to that from which Ia was made. Bead Ib' was made like Ib except that in drawing it was twisted. Bead Ic is made from a simple gathering which has been squared in section before drawing. Bead Ic' is like Ic but has been twisted in drawing. The same observations apply to Id and Id' as to Ib and Ib'. Bead Ie is made from a gathering which has been shaped to a ridged form before drawing, while Ie' is the same which has been twisted in drawing. Bead If is a section of tube whose surface has been modified into facets by grinding.

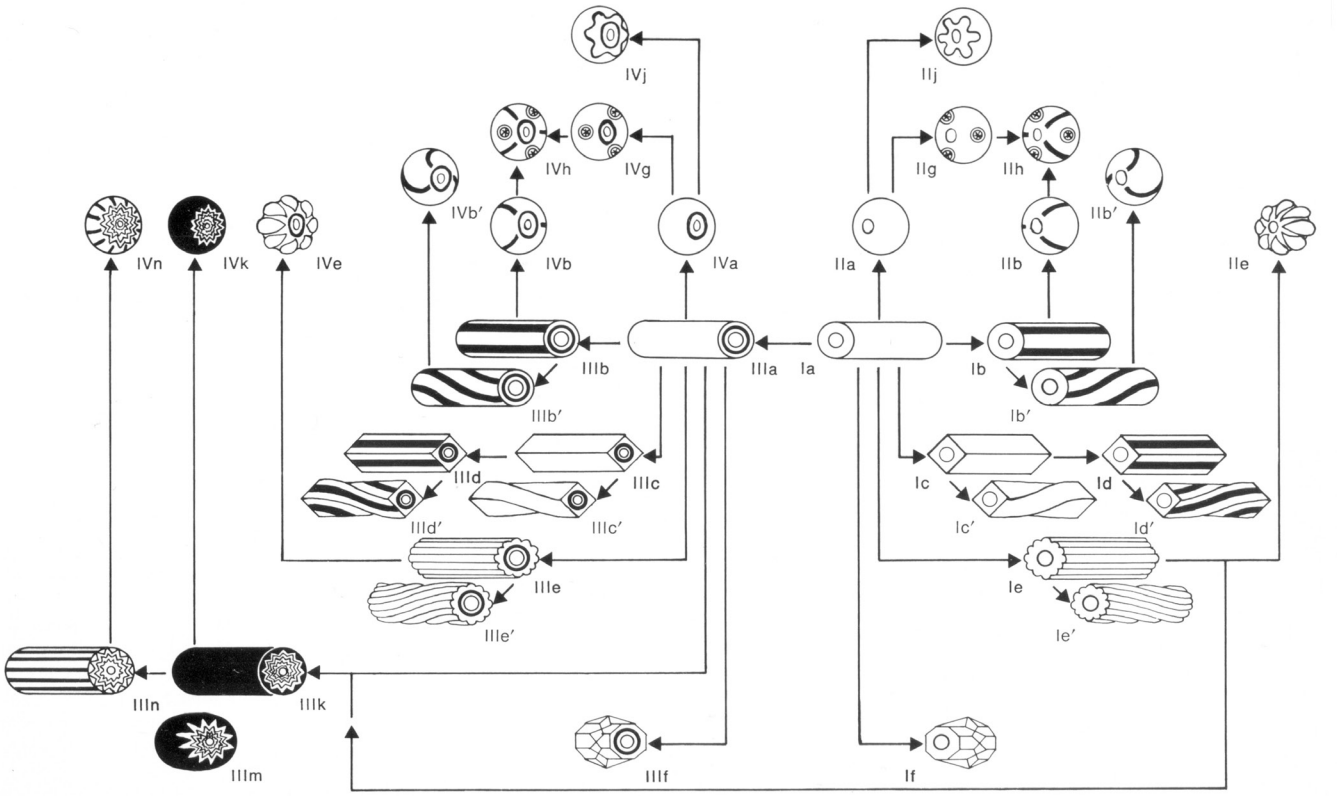

Figure 3. Master identification chart for tube beads.

Class II

Beads in the second quadrant are designated as Tube Beads, Class II (Table 4). Basically, all are theoretically, and probably in practice, derived from Class I types. The essential difference is that, instead of being left in the tube shape, they have been subjected to rounding by reheating (as previously described). The simplest form is, of course, bead IIa, which is derived from Ia by reheating and tumbling the latter until it assumes the round form. Similarly, IIb derives from Ib, IIb' from Ib', and IIe from Ie. Bead IIg is a derivative of IIa, to which round insets or "eyes" have been added, while IIh is a combination of IIb and IIg. Bead IIj is like bead IIa with the addition of two or more wavy lines of a different colour in which the waves may be parallel, crossed, or spiralled.

Class III

Beads in the third quadrant are designated as Tube Beads, Class III (Table 5). With the exception of the star beads (IIIm and IIIn), all the beads in this quadrant have analogies in quadrant I, the essential difference being that, whereas the latter are made from the monochrome gathering, those in quadrant III are made from a two- or multilayered gathering. The star[5] beads have up to seven layers of glass, each with twelve ridges, and each alternate layer consisting of an opaque white glass. Bead IIIk is a simple star tube; IIIm is derived from IIIk by grinding down the ends to show the internal design (and is the true star bead); IIIn is similar to IIIk with the addition of three stripes not unlike those in the "b" varieties.

Class IV

Beads in the fourth quadrant of the first chart are designated as Tube Beads, Class IV (Table 6). They derive from the Class III beads in a fashion parallel to the derivation of Class III beads from Class I beads, and are, like the Class III beads, rounded by reheating. The two beads IVk and IVn have no analogies in the second quadrant, for they are derived from IIIk and IIIn by reheating.

There are two special cases in the classification of tube beads which require explanation. The first is that in which compound stripes occur. It will be recalled that beads with simple stripes are classed as Ib, IIb, IIIb, and IVb. Similar beads with compound stripes are designated as Ibb, IIbb, and IIIbb, and IVbb, respectively. The second exception, including beads which look like inferior imitations of the bead IVn, is designated as IVnn.

Table 1. Color Names and their Codes.

Codes	Name	Type of Glass	Codes	Name	Type of Glass
6 le (10.0R 4/8)	Redwood	op - cl	23 ni (10.0GY 4/4)	Dark Palm Green	cl
8 pc (2.5R 3/10)	Ruby	cl	20 ng (5.0BG 3/6)	Teal Green	cl
7 pa (7.5R 4/14)	Scarlet	cl	17 pa (10.0BG 4/8)	Turquoise	cl
p (N 1/0)	Lamp Black	op	16 ea (5.0B 8/4)	Light Aqua Blue	op - cl - tr
c (N 7/0)	Light Gray	cl	18 gc (2.5B 6/4)	Aqua Blue	op - tr
b (N 8/0)	Oyster White	cl - tr	16 ic (5.0B 6/6)	Robin's Egg Blue	op - tr
a (N 9/0)	White	op	16 lc (5.0B 5/7)	Bright Blue	cl - tr
15 ca (7.5B 8/2)	Pale Blue	op - cl - tr	15 nc (7.5B 4/8)	Cerulean Blue	cl
1 la (10.0Y 8/10)	Lemon Yellow	op - cl	14 ia (2.5PB 6/9)	Bright Copen Blue	op - cl
2 ic (2.5Y 7/8)	Light Gold	op - cl	14 ie (2.5PB 5/4)	Shadow Blue	op - cl - tr
3 lc (10.0YR 7/8)	Amber	op - cl	15 ni (7.5B 3/3)	Dark Shadow Blue	op - cl
3 le (10.0YR 5/6)	Cinnamon	op - cl	13 la (7.5PB 4/11)	Bright Dutch Blue	op
4 ng (7.5YR 4/4)	Maple	cl	13 pa (6.25PB 3/12)	Ultramarine	cl
1 gc (10.0Y 7/5)	Citron	cl - tr	13 pg (7.5PB 2/7)	Bright Navy	cl
2 lg (5.0Y 4/4)	Mustard Tan	op	14 pi (10.0B 2/4)	Dark Navy	cl
2 pn (2.5Y 2/2)	Dark Brown	op	7 ga (5.0R 7/8)	Light Cherry Rose	op - cl
22 ia (2.5G 7/8)	Bright Mint Green	op - cl	8 le (10.0RP 4/6)	Rose Wine	cl
23 ic (10.0GY 6/6)	Apple Green	op - cl	11 lc (7.5P 4/8)	Amethyst	cl
22 ie (5.0G 5/4)	Surf Green	op - tr	7 pn (2.5YR 2/2)	Dark Rose Brown	cl - tr
21 nc (10.0G 5/10)	Emerald Green	cl	6 lc (10.0R 5/10)	Coral	tr

Editor's note: The color names are derived from Taylor, Knoche, and Granville (1950) and are those that appear in the *Color Harmony Manual* used by the Kidds to determine bead colors. Munsell color codes follow the *Color Harmony* ones as the manual is now long out of print and generally unavailable.

Table 2. Abbreviations Used in the Tables.

Shape		Type of Glass	Size
R - Round	CO - Corn	op - Opaque	VS - Very Small, under 2 mm
C - Circular (ring)	ME - Melon	cl - Clear [tsp - Transparent preferred]	S - Small, 2-4 mm
O - Oval	RA - Raspberry	tr - Translucent	M - Medium, 4-6 mm
T - Tube	ST - Star		L - Large, 6-10 mm
F - Flat	FA - Facetted		VL - Very Large, over 10 mm
D - Disk	DO - Doughnut		

Table 3. Description of Class I Beads.

Type	Bead Number	Size	Glass	Name of Colour
Ia	Ia1	VS	op	Redwood
		S	op	Redwood
		M	op	Redwood
		L	op	Redwood
	Ia2	S	op	Black
		M	op	Black
		L	op	Black
		VL	op	Black
	Ia3	M	cl	Lt. Gray
	Ia4	S	tr	Oyster White
		M	tr	Oyster White
	Ia5	S	op	White
		M	op	White
	Ia6	S	op	Lt. Ivory
	Ia7	S	op	Lt. Gold
	Ia8	S	tr	Citron
Ia	Ia9	L	op	Brite Mint Green
	Ia10	M	op	Surf Green
	Ia11	M	tr	Teal Green
	Ia12	M	cl	Turquoise
	Ia13	S	tr	Aqua Blue
	Ia14	M	op	Robin's Egg Blue
	Ia15	L	tr	Brite Blue
	Ia16	M	op	Shadow Blue
	Ia17	S	cl	Dk. Shadow Blue
	Ia18	S	cl	Ultramarine
		M	cl	Ultramarine
	Ia19	S	cl	Brite Navy
		M	cl	Brite Navy
	Ia20	L	cl	Dark Navy
	Ia21	S	cl	Rose Wine
	Ia22	S	tr	Dk. Rose Brown

Body					**Simple Stripes**		
Type	Bead Number	Size	Glass	Name of Colour	Number of Stripes and Name of Colour		
Ib	Ib1	L	op	Redwood	6 Black		
	Ib2	S	op	Redwood	6 White		
	Ib3	S	op	Black	3 Redwood		
		L	op	Black	3 Redwood		
	Ib4	S	op	Black	3 White		
	Ib5	L	op	Black	3 White	3 Redwood	
	Ib6	M	cl	Lt. Gray	6 Ultramarine		
	Ib7	S	tr	Oyster White	3 Redwood	3 Ultramarine	
	Ib8	L	tr	Oyster White	6 Redwood	6 Ultramarine	
	Ib9	M	tr	Oyster White	3 Redwood	3 Dk. Palm Green	
	Ib10	S	op	White	3 Redwood		
	Ib11	L	op	White	6 Redwood		
	Ib12	M	op	White	3 Black		
	Ib13	M	op	Pale Blue	3 Redwood		
	Ib14	S	op	Lt. Gold	3 Dk. Palm Green		
	Ib15	L	op	Lt. Gold	3 Dk. Palm Green	3 Redwood	
	Ib16	M	op	Amber	6 Redwood	6 Black	
	Ib17	S	cl	Apple Green	3 Redwood		
	Ib18	L	cl	Teal Green	8 White		
	Ib19	L	tr	Aqua Blue	3 Redwood		
	Ib20	M	tr	Robin's Egg Blue	3 Redwood		
	Ib21	S	op	Shadow Blue	6 Redwood		
	Ib22	L	cl	Dk. Shadow Blue	6 Redwood	6 White	
	Ib23	S	cl	Brite Navy	3 Redwood		
	Ib24	M	tr	Dk. Rose Brown	2 Redwood	2 White	

				Body	**Compound Stripes**		
Type	Bead Number	Size	Glass	Name of Colour	Number of Stripes and Name of Their Colours		
Ibb	Ibb1	M	op	Redwood	3 Brite Navy	on White	
		L	op	Redwood	3 Brite Navy	on White	
	Ibb2	S	op	Black	3 Redwood	on White	
		L	op	Black	3 Redwood	on White	
	Ibb3	L	op	White	4 Lt. Gold (Double)	on Maple	
	Ibb4	M	op	Pale Blue	3 White	on Redwood	
	Ibb5	L	op	Brite Mint Green	4 Lemon Yellow	on Scarlet	on White
	Ibb6	S	op	Aqua Blue	3 Redwood	on White	

Table 3. Continued.

				Body	Simple Stripes	
Type	Bead Number	Size	Glass	Name of Colour	Number of Stripes and Name of Their Colour	
Ib′	Ib′1	M	op	Redwood	8 White	
	Ib′2	M	op	White	9 Brite Navy (3 groups of 3 fine stripes)	
	Ib′3	M	cl	Dk. Shadow Blue	3 Redwood	3 White
	Ib′4	M	cl	Brite Navy	8 White	

				Body	Compound Stripes	
Type	Bead Number	Size	Glass	Name of Colour	Number of Stripes and Name of Their Colour	
Ibb′	Ibb′1	M	op	Surf Green	3 White	on Redwood

Type	Bead Number	Size	Glass	Name of Colour	Number of Sides
Ic	Ic1	M	op	Redwood	4
		L	op	Redwood	4
	Ic2	S	cl	Ruby	4
	Ic3	VS	cl	Scarlet	6
	Ic4	S	op	Black	6
	Ic5	S	cl	Lt. Gray	5
	Ic6	VS	cl	Oyster White	5
		S	cl	Oyster White	5
	Ic7	VS	cl	Lemon Yellow	6
	Ic8	S	cl	Amber	5
	Ic9	VS	cl	Apple Green	5
		S	cl	Apple Green	5
	Ic10	VS	cl	Turquoise	5
	Ic11	VS	tr	Brite Blue	4
	Ic12	S	cl	Brite Copen Blue	6
		M	cl	Brite Copen Blue	6
	Ic13	M	cl	Brite Navy	6
	Ic14	VS	cl	Brite Navy	5
	Ic15	S	tr	Dk. Rose Brown	4

Type	Bead Number	Size	Glass	Name of Colour	Type of Twist
Ic′	Ic′1	S	op	Redwood	Loose Twist
		M	op	Redwood	Medium Twist
		L	op	Redwood	Tight Twist
	Ic′2	M	cl	Apple Green	Tight Twist
	Ic′3	M	cl	Ultramarine	Tight Twist

				Body	Simple Stripe
Type	Bead Number	Size	Glass	Name of Colour	Number of Stripes and Name of Their Colour
Id	Id1	M	op	Redwood	8 White (Thin)

				Body	Simple Stripes	
Type	Bead Number	Size	Glass	Name of Colour	Number of Stripes and Name of Their Colour	Type of Twist
Id′	Id′1	M	op	Redwood	8 White (Thin)	Loose Twist

Table 3. Continued.

Type	Bead Number	Size	Glass	Name of Colour
Ie	Ie1	L	op	Redwood

Type	Bead Number	Size	Glass	Name of Colour	Type of Twist
Ie′	Ie′1	L	op	Redwood	Medium Twist
	Ie′2	M	cl	Apple Green	Medium Twist

Type	Bead Number	Size	Glass	Name of Colour	Number of Sides
If	If1	L	op	Black	6
	If2	L	cl	Lt. Gray	6
	If3	L	cl	Emerald	6
	If4	S	cl	Turquoise	5
	If5	L	cl	Amethyst	6

The Wire-Wound Bead Chart

Because they are handcrafted, it is impossible to reduce wire-wound beads to a neat classification, but for ease in reference, they have been divided into three groups. All wire-wound bead designations are prefaced by the letter W (Table 7; Figure 4). Group WI comprises beads of simple shapes; i.e., tube, round, oval, and doughnut. They are all monochrome. Beads of Group WII are also monochrome but are more elaborately shaped, either by pinching, molding, or some other form of manipulation. The so-called "corn" beads, disc, facetted, raspberry, melon, and odd-shaped forms occur in this group. Group WIII beads are beads of any of the above shapes which are not monochrome, and which may, and often do, have adventitious surface decorations of contrasting colours.

The numbering system has had to be rather more arbitrary than in the case of the tube beads where some systematic developmental order could be discerned. Hence, the following arrangement is presented as covering more or less adequately the contingencies encountered in this class.

Tubular forms are designated as WIa, round as WIb, oval as WIc, and doughnut-shaped beads as WId. The beads of the second group are subdivided as follows: flattened corn-shaped beads, WIIa; disc beads, WIIb; facetted beads, WIIc; raspberry beads, WIId; melon beads, WIIe; cog-shaped or multilateral beads, WIIf; and beads with a pressed design, WIIg.

WIII beads may be any wire-wound bead with additional decoration which may be superimposed on or inlaid in the metal. Thus bead WIb, with a surface coating of a different colour or material, becomes WIIIa; WIb with an inlaid decoration becomes WIIIb; WIIb with an inlaid decoration becomes WIIIc; WIc with a spiral overlaid decoration becomes WIIId; and WIIc with a coating of a different material or colour becomes WIIIe.

The taxonomic system outlined above is based essentially on such characteristics as are observable by visual inspection; the only mechanical aids which might be required would be a low-powered hand lens and a millimetre rule. It has not been within the authors' means to employ complicated laboratory tests to determine the chemical nature of the beads concerned, nor is the field archaeologist likely to have either this laboratory equipment or the background training to use it. His determinations will be, for the most part, empirical. The very simplicity makes the system more useful than would be the case if such devices as spectrographic analysis were an integral part. Certainly the desirability of such analyses can not be denied, however. It is greatly to be hoped that in the near future the means and the facilities for carrying out laboratory analyses of beads will be available. When this becomes possible, the inadequacies (and no doubt the errors) of the present system will be smoothed out and it will become more reliable. But till that happy day arrives, perhaps the system suggested here will serve a useful purpose and make the field archaeologist's task a little easier.

HOW TO USE THE CLASSIFICATION SYSTEM TO IDENTIFY BEADS

To identify any bead, it is necessary to consult (a) the Tube Bead chart and the Wire-Wound Bead chart; (b) the colour chart of beads already identified (Tables 3-7); (c) the

Table 4. Description of Class II Beads.

Type	Bead Number	Shape	Size	Glass	Name of Colour
IIa	IIa1	R	VS	op	Redwood
		R	S	op	Redwood
		R	M	op	Redwood
		R	L	op	Redwood
	IIa2	C	M	op	Redwood
	IIa3	O	S	op	Redwood
	IIa4	R	M	cl	Redwood
	IIa5	R	VS	cl	Ruby
	IIa6	R	VS	op	Black
		R	S	op	Black
		R	M	op	Black
		R	L	op	Black
		R	VL	op	Black
	IIa7	C	VS	op	Black
		C	S	op	Black
		C	M	op	Black
	IIa8	O	S	op	Black
		O	M	op	Black
		O	L	op	Black
	IIa9	R	L	cl	Lt. Gray
	IIa10	O	S	cl	Lt. Gray
	IIa11	R	VS	tr	Oyster White
	IIa12	C	S	tr	Oyster White
	IIa13	R	VS	op	White
		R	S	op	White
		R	M	op	White
		R	L	op	White
	IIa14	C	S	op	White
	IIa15	O	S	op	White
		O	M	op	White
	IIa16	R	L	op	Pale Blue
	IIa17	R	VS	op	Lt. Gold
		R	S	op	Lt. Gold
		R	M	op	Lt. Gold
	IIa18	R	VS	op	Amber
		R	S	op	Amber
	IIa19	C	S	op	Amber
	IIa20	R	S	op	Cinnamon
	IIa21	R	S	tr	Citron
	IIa22	R	S	op	Mustard Tan
	IIa23	R	S	cl	Brite Mint Green
	IIa24	R	S	op	Apple Green
	IIa25	R	VS	op	Surf Green
		R	M	op	Surf Green
	IIa26	R	VS	cl	Emerald Green
	IIa27	C	S	cl	Emerald Green
	IIa28	R	M	cl	Dk. Palm Green
		R	L	cl	Dk. Palm Green
IIa	IIa29	O	S	cl	Dk. Palm Green
	IIa30	F	L	cl	Dk. Palm Green
	IIa31	R	VS	cl	Turquoise
		R	M	cl	Turquoise
		R	L	cl	Turquoise
	IIa32	O	S	cl	Turquoise
	IIa33	R	L	cl	Lt. Aqua Blue
	IIa34	C	M	tr	Lt. Aqua Blue
	IIa35	R	M	op	Lt. Aqua Blue
	IIa36	R	S	op	Aqua Blue
		R	M	op	Aqua Blue
	IIa37	C	S	op	Aqua Blue
	IIa38	O	S	op	Aqua Blue
	IIa39	R	S	tr	Aqua Blue
	IIa40	R	VS	op	Robin's Egg Blue
		R	S	op	Robin's Egg Blue
		R	M	op	Robin's Egg Blue
		R	L	op	Robin's Egg Blue
	IIa41	C	S	op	Robin's Egg Blue
	IIa42	O	S	op	Robin's Egg Blue
	IIa43	R	VS	tr	Brite Blue
		R	S	tr	Brite Blue
	IIa44	R	VS	cl	Cerulean Blue
		R	M	cl	Cerulean Blue
		R	L	cl	Cerulean Blue
	IIa45	C	S	cl	Brite Copan Blue
	IIa46	R	S	op	Shadow Blue
		R	M	op	Shadow Blue
	IIa47	C	S	op	Shadow Blue
	IIa48	R	S	op	Dk. Shadow Blue
	IIa49	O	S	op	Dk. Shadow Blue
	IIa50	R	S	cl	Dk. Shadow Blue
		R	L	cl	Dk. Shadow Blue
	IIa51	C	S	cl	Dk. Shadow Blue
	IIa52	R	M	cl	Ultramarine
		R	L	cl	Ultramarine
	IIa53	C	S	cl	Ultramarine
	IIa54	O	L	cl	Ultramarine
	IIa55	R	S	cl	Brite Navy
		R	L	cl	Brite Navy
	IIa56	C	S	cl	Brite Navy
	IIa57	O	S	cl	Brite Navy
	IIa58	R	VS	cl	Lt. Cherry Rose
		R	S	cl	Lt. Cherry Rose
	IIa59	C	M	cl	Rose Wine
	IIa60	O	S	cl	Rose Wine
	IIa61	R	S	cl	Dk. Rose Brown

written description to accompany the bead charts; and (d) the table of colours (Table 1). The following steps will be found helpful:

1. Determine whether the bead under examination is a tube or a wire-wound bead *(see* section on Technology of Glass Beads).

2. If the bead is a tube bead type: (i) consult the tube bead chart to determine whether it follows the tube form or the rounded form; (ii) determine whether it is a Simple Bead (Class I or Class II) or a Layered Bead (Class III or Class IV). For example, in examining a group of tube beads, note those which are simple monochromes; those which are layered; and those which have stripes, eyes, etc. The same technique should be applied to round beads derived from tubes.

3. If the bead is wire-wound, consult the wire-wound bead chart for its proper placement.

Table 4. Continued.

					Body	Simple Stripes		
Type	Bead Number	Shape	Size	Glass	Name of Colour	Number of Stripes Style of Stripes (Average width unless noted) Colour of Stripes		
IIb	IIb1	R	S	op	Redwood	6 op Black		
	IIb2	R	M	op	Redwood	3 op White		
	IIb3	R	M	op	Redwood	4 op White		
	IIb4	O	S	op	Redwood	4 op White		
	IIb5	R	S	op	Redwood	6 op White		
	IIb6	R	S	op	Redwood	8 op White		
	IIb7	R	L	op	Redwood	12 op White		
	IIb8	R	L	op	Redwood	6 op Lemon Yellow		
	IIb9	R	M	op	Black	3 op Redwood		
	IIb10	R	S	op	Black	3 op White		
		R	VL	op	Black	3 op White		
	IIb11	O	M	op	Black	3 op White		
	IIb12	R	M	op	Black	4 op White		
	IIb13	R	L	op	Black	10 op White		
	IIb14	R	L	op	Black	3 op Double White		
	IIb15	R	L	op	Black	3 op Broad Redwood	3 Broad White	
	IIb16	R	L	op	Black	3 op Ruby	3 Lt. Cherry Rose	
	IIb17	R	M	op	Black	3 op Redwood	3 White	3 Lemon Yellow
	IIb18	R	S	cl	Lt. Gray	12 op Thin White	These are called "Gooseberry" beads. The stripes may vary from 12 to 15 and colour may vary from very light to dark with occasionally a yellow cast.	
		R	M	cl	Lt. Gray	12 op Thin White		
		R	L	cl	Lt. Gray	12 op Thin White		
	IIb19	O	S	cl	Lt. Gray	12 op Thin White		
	IIb20	R	L	op	White	3 op Redwood		
	IIb21	O	L	op	White	3 op Redwood		
	IIb22	F	L	op	White	8 op Redwood		
	IIb23	R	M	op	White	4 op Black		
	IIb24	O	M	op	White	4 op Black		
	IIb25	R	M	op	White	4 tr Brite Navy		
	IIb26	O	M	op	White	4 tr Brite Navy		
	IIb27	R	L	op	White	9 tr Brite Navy	(3 Groups of 3 Fine Lines)	
	IIb28	O	L	op	White	9 tr Brite Navy	(3 Groups of 3 Fine Lines)	
	IIb29	R	M	op	White	3 op Redwood	3 op Black	
	IIb30	O	M	op	White	3 op Redwood	3 op Black	
	IIb31	R	S	op	White	2 op Redwood	2 tr Brite Navy	
		R	M	op	White	2 op Redwood	2 tr Brite Navy	
	IIb32	O	M	op	White	2 op Redwood	2 tr Brite Navy	
	IIb33	R	M	op	White	3 op Redwood	3 tr Dk. Palm Green	
	IIb34	O	M	op	White	3 op Redwood	3 tr Dk. Palm Green	
	IIb35	R	M	op	White	4 op Lemon Yellow	4 tr Dk. Palm Green	
	IIb36	O	M	op	White	4 op Lemon Yellow	4 tr Dk. Palm Green	
	IIb37	R	M	op	White	2 op Dk. Brown	2 tr Dk. Palm Green	
	IIb38	R	M	op	White	2 op Dk. Brown	2 tr Dk. Palm Green	
	IIb39	R	M	op	White	2 op Redwood	2 Dk. Palm Green	2 Brite Navy

4. Consult the colour illustrations of the individual beads for visual identification (Plates V-IX).

5. Consult the written descriptions which correspond to the colour illustrations to determine the precise colour, quality, size, and shape classification (a full description of the above appears in Tables 3-7).

If no matching is possible, a new type may have been found; in which case it is desirable that it be reported in order that it may be properly incorporated into the system. If this suggestion meets with general favour, periodic supplements to this paper would be a possibility.[6]

ACKNOWLEDGEMENTS

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Table 4. Continued.

Type	Bead Number	Shape	Size	Glass	Body: Name of Colour	Simple Stripes: Number of Stripes, Style of Stripes, Colour of Stripes			
IIb	IIb40	O	M	op	White	2	op	Redwood	2 Dk. Palm Green 2 Brite Navy
	IIb41	R	M	op	White	3	tr	Dk. Palm Green	3 tr Brite Navy
	IIb42	R	M	op	Pale Blue	3	op	Redwood	
	IIb43	R	M	op	Pale Blue	3	op	Redwood	3 tr Brite Navy
	IIb44	O	M	op	Pale Blue	5	op	Redwood	5 tr Brite Navy
	IIb45	R	M	cl	Lt. Gold	4	op	White	
	IIb46	R	M	op	Lt. Gold	2	op	Redwood	2 tr Dk. Palm Green
	IIb47	F	L	op	Lt. Gold	2	op	Redwood	2 tr Dk. Palm Green
	IIb48	R	M	op	Mustard Tan	8	op	Redwood	
		R	L	op	Mustard Tan	8	op	Redwood	
	IIb49	O	L	op	Mustard Tan	8	op	Redwood	
	IIb50	R	L	op	Mustard Tan	8	op	White	
	IIb51	F	L	tr	Surf Green	8	op	Lt. Gold	
	IIb52	R	M	cl	Emerald Green	4	op	White	
	IIb53	R	L	cl	Teal Green	8	op	White	
	IIb54	R	L	tr	Lt. Aqua Blue	8	op	Redwood	
	IIb55	F	L	tr	Lt. Aqua Blue	8	op	Redwood	
	IIb56	R	S	op	Robin's Egg Blue	3	op	White	
		R	M	op	Robin's Egg Blue	3	op	White	
		R	L	op	Robin's Egg Blue	3	op	White	
	IIb57	R	L	op	Robin's Egg Blue	4	op	White	
	IIb58	R	M	op	Robin's Egg Blue	2	op	Redwood	2 op White
	IIb59	R	L	tr	Brite Blue	3	op	Redwood	
	IIb60	O	S	cl	Brite Copan Blue	12	tr	Brite Navy "Gooseberry" Bead	
	IIb61	R	M	op	Shadow Blue	6	op	Redwood	
	IIb62	R	M	cl	Dk. Shadow Blue	8	op	Redwood	
	IIb63	O	S	cl	Dk. Shadow Blue	2	op	White	
	IIb64	O	M	cl	Dk. Shadow Blue	2	op	Redwood	2 op White
	IIb65	R	L	cl	Brite Navy	2	op	Broad Redwood	
	IIb66	O	L	cl	Brite Navy	4	op	Redwood	
	IIb67	O	S	cl	Brite Navy	3	op	White	
		O	L	cl	Brite Navy	3	op	White	
	IIb68	R	M	cl	Brite Navy	4	op	White	
	IIb69	O	S	cl	Brite Navy	4	op	White	
	IIb70	R	L	cl	Brite Navy	16	op	Thin White	
	IIb71	R	M	cl	Brite Navy	2	op	Redwood	2 op White
	IIb72	O	S	cl	Brite Navy	2	op	Redwood	2 op White
	IIb73	O	M	tr	Dk. Navy	3	op	White	
	IIb74	R	L	tr	Dk. Rose Brown	9	op	White (3 Groups of 3 Thin Lines)	

author held in 1951-52 for the general study of trade goods among the American Indians of the Northeast. He was later assisted by a grant from the Corning Museum of Glass, given for the study of glass beads in the same area, and by aid toward clerical assistance from the Canada Council. To each of these agencies he wishes to acknowledge a deep debt of gratitude, for without such help the study could not have been carried to completion.

At the outset, virtually all of the important collections, both in private hands and in public museums in the Northeast, were examined by both authors, notes made upon individual specimens, and numerous photographs and drawings made. At later dates, collections in British and European museums were examined, a visit made to the glassworks at Murano, Italy, and archival and library research carried out.

Both authors wish to thank all those who made their collections available for study. Their names are many, and it would be impossible to list them all here, but special thanks are due to one of them, Mr. Charles F. Wray, of West Rush, New York. Mr. Wray made his extensive bead collection available to us for study. His interest in the subject and generosity in imparting his hard-won knowledge greatly enhanced the value of the research.

Table 4. Continued.

					Body	Compound Stripes		
Type	Bead Number	Shape	Size	Glass	Name of Colour	Number of Stripes Style of Stripes Colour of Stripes		
IIbb	IIbb1	R	L	op	Redwood	3 Brite Navy	on White	
	IIbb2	F	L	op	Redwood	3 Brite Navy	on White	
	IIbb3	R	L	op	Redwood	4 Brite Navy	on White	
	IIbb4	R	VL	op	Redwood	3 Brite Navy 3 Lt. Gold	on White	
	IIbb5	R	L	op	Black	5 Thin Redwood	on White	
	IIbb6	O	M	op	Black	3 Thin Redwood	on White	
	IIbb7	R	VL	op	Black	3 Broad Redwood	on White	
	IIbb8	R	VL	op	Black	3 Double Redwood	on White	
	IIbb9	R	VL	op	Black	3 Lemon Yellow between Redwood		
	IIbb10	R	VL	op	Black	3 Lemon Yellow between Redwood 3 Fine Brite Navy	on White	
	IIbb11	R	VL	op	Black	2 Fine Redwood 2 Redwood 2 Amber	on White	
	IIbb12	R	M	op	White	3 Brite Navy	on Redwood	
	IIbb13	O	M	op	White	3 Brite Navy	on Redwood	
	IIbb14	R	M	op	White	3 Lemon Yellow	on Brite Navy	(Yellow stripe
	IIbb15	O	M	op	White	3 Lemon Yellow	on Brite Navy	appears green)
	IIbb16	R	M	op	White	3 Redwood	on Dk. Palm Green	
	IIbb17	O	M	op	White	3 Redwood	on Dk. Palm Green	
	IIbb18	R	M	op	Pale Blue	3 Redwood	on White	
	IIbb19	O	M	op	Pale Blue	3 Redwood	on White	
	IIbb20	R	VL	op	Mustard Tan	4 Brite Navy 8 Redwood (In Pairs Between Other Stripes)	on White	
	IIbb21	R	M	op	Teal Green	3 Redwood	on White	
	IIbb22	R	M	op	Lt. Aqua Blue	3 Redwood	on White	
	IIbb23	O	M	op	Lt. Aqua Blue	3 Redwood	on White	
	IIbb24	R	M	op	Robin's Egg Blue	3 Redwood	on White	
	IIbb25	O	M	op	Robin's Egg Blue	3 Redwood	on White	
	IIbb26	R	M	op	Robin's Egg Blue	3 Redwood	on Lemon Yellow	
	IIbb27	R	M	cl	Brite Navy	3 Redwood	on White	
	IIbb28	O	S	cl	Brite Navy	3 Dk. Brown	on White	
	IIbb29	F	L	cl	Dk. Rose Brown	3 Brite Navy	on White	

					Body	Simple Stripes		
Type	Bead Number	Shape	Size	Glass	Name of Colour	Number of Stripes Colour of Stripes		
IIb′	IIb′1	R	M	op	Redwood	6 White		
	IIb′2	R	S	op	Black	7 White		
	IIb′3	O	M	op	Black	3 White		
	IIb′4	O	L	tr	Oyster White	Numerous irregular stripes–Lt. Gold, Redwood, Ultramarine, Aqua Blue. (Marbled effect)		
	IIb′5	R	M	op	White	6 Redwood		
	IIb′6	O	M	op	White	6 Redwood		
	IIb′7	O	M	op	White	9 Brite Navy (3 Groups of 3 Thin Lines)		
	IIb′8	O	M	op	White	3 Lemon Yellow	3 Brite Navy	
	IIb′9	O	L	op	Mustard Tan	6 White		
	IIb′10	F	L	op	Mustard Tan	6 White		
	IIb′11	R	L	op	Robin's Egg Blue	6 Redwood	(6 Stripes which had disappeared)	
	IIb′12	R	M	tr	Brite Navy	4 White		
	IIb′13	R	L	cl	Dk. Rose Brown	9 White (3 Groups of 3 Thin Lines)		

Table 4. Continued.

					Body	**Compound Stripes**	
Type	Bead Number	Shape	Size	Glass	Name of Colour	Number of Stripes Colour of Stripes	
IIbb′	IIbb′1	R	L	op	Teal Green	3 Redwood	on Lemon Yellow
	IIbb′2	R	L	op	Robin's Egg Blue	6 Redwood	on Lemon Yellow

					Body	**"Melon" Beads**
Type	Bead Number	Shape	Size	Glass	Name of Colour	
IIe	IIe1	R	M	cl	Brite Blue	7 Ridges
	IIe2	R	M	cl	Brite Blue	8 Ridges

					Body	**"Flush Eye" Beads**	
Type	Bead Number	Shape	Size	Glass	Name of Colour	Name of Colour	Decoration
IIg	IIg1	R	M	op	Black	3 White Dots	
	IIg2	O	M	op	White	3 Redwood Stars	
	IIg3	R	M	op	White	3 Redwood Stars on White Dots on Brite Blue Dots	
	IIg4	R	M	op	White	3 Brite Navy Dots each containing 2 White Rings	
	IIg5	R	M	op	Shadow Blue	3 Redwood Dots on White Dots	

					Bead with "Flush Eye" and Stripes This bead has always appeared as two joined beads	
					Body	**Decoration**
Type	Bead Number	Shape	Size	Glass	Name of Colour	Name of Colours Description
IIh	IIh1	O	M	op	Shadow Blue	3 Redwood Stars on White Dots 3 White Stripes between "Flush Eyes"

					"Roman" Beads		
					Body	**Decoration**	
Type	Bead Number	Shape	Size	Glass	Name of Colour	Name of Colours Description of Decoration	
IIj	IIj1	R	M	op	Black	2 White Parallel Wavy Lines	
	IIj2	R	L	op	Black	3 White Alternating Wavy Lines	
	IIj3	R	L	op	Black	2 Lemon Yellow Alternating Wavy Lines	
	IIj4	R	L	op	Black	1 Lemon Yellow between 2 White Parallel Wavy Lines	
	IIj5	R	L	op	Black	2 White Spirals between 2 Lemon Yellow Spirals	
	IIj6	R	M	cl	Brite Blue	2 White Alternating Wavy Lines	

To Dr. Paul N. Perrot, Director of the Corning Museum of Glass, special thanks are due for encouragement and sound advice. The authors wish to emphasize, however, that they alone are responsible for whatever shortcomings the paper may have, as well as for any errors which may occur.

EDITOR'S ENDNOTES

1. The classification system for glass beads devised by Dr. Kenneth E. Kidd and Martha Ann Kidd is a classic in bead research. Originally published in *Canadian Historic Sites: Occasional Papers in Archaeology and History* 1 (1970), it remains the best system for classifying drawn beads and has found broad acceptance, especially in the eastern United States. Being a pioneering effort, it is far from complete and I subsequently added many new types and made a few corrections in my "Guide to the Description and Classification of Glass Beads" in *Glass Beads* (1982, 1985). Due to its historic value and its continued usefulness to those studying European glass beads, the Kidds' report is reprinted here complete with the color plates. The text remains unchanged except for

Table 5. Description of Class III Beads.

				Outside Layer		Core		Middle Layer	
Type	Bead Number	Size	Glass	Colour Name	Glass	Colour Name	Glass	Colour Name	
IIIa	IIIa1	M	op	Redwood	op	Black			
	IIIa2	M	op	Redwood	cl	Lt. Gray			
	IIIa3	S	op	Redwood	cl	Apple Green			
		M	op	Redwood	cl	Apple Green			
	IIIa4	M	op	Redwood	cl	Brite Blue			
	IIIa5	M	cl	Scarlet	op	White			
	IIIa6	M	cl	Lt. Gray	cl	Lt. Gray	op	Redwood	
	IIIa7	M	cl	Lt. Gray	cl	Lt. Gray	op	White	
	IIIa8	S	tr	Oyster White	cl	Lt. Gray			
	IIIa9	S	tr	Shadow Blue	cl	Brite Navy			
	IIIa10	VS	cl	Ultramarine	cl	Ultramarine	op	White	
		S	cl	Ultramarine	cl	Ultramarine	op	White	
	IIIa11	S	cl	Brite Navy	cl	Lt. Gray	op	White	
	IIIa12	VS	cl	Brite Navy	cl	Brite Navy	op	White	
		S	cl	Brite Navy	cl	Brite Navy	op	White	
		M	cl	Brite Navy	cl	Brite Navy	op	White	

				Outside Layer		Core		Middle		Simple Stripes	
Type	Bead Number	Size	Glass	Colour Name	Glass	Colour Name	Glass	Colour Name		Colour Name Number of Stripes	
IIIb	IIIb1	VS	op	Redwood	op	Black			6 op	White	
	IIIb2	M	op	Redwood	cl	Apple Green			6 op	White	
	IIIb3	S	cl	Lt. Gray	cl	Lt. Gray	op	White	3 op	Black	
	IIIb4	S	tr	Oyster White	cl	Brite Copan Blue			6	Redwood	6 Brite Navy
	IIIb5	L	tr	Oyster White	cl	Brite Copan Blue			4	Redwood	4 Brite Navy
	IIIb6	L	cl	Lt. Aqua Blue	cl	Lt. Aqua Blue	op	White	8 op	White	
	IIIb7	M	cl	Shadow Blue	cl	Shadow Blue	op	White	8 op	White	
	IIIb8	M	cl	Dk. Shadow Blue	op	Redwood	op	White	3 op	White	
	IIIb9	L	cl	Brite Navy	cl	Brite Navy	op	White	15 op	White	
	IIIb10	VL	cl	Dk. Navy	cl	Dk. Navy	op	White	16 op	White	

				Outside Layer		Core		Middle		Compound Stripes	
Type	Bead Number	Size	Glass	Colour Name	Glass	Colour Name	Glass	Colour Name		Colour Name Number of Stripes	
IIIbb	IIIbb1	L	op	Redwood	cl	Black			3 op	Black	on White
	IIIbb2	S	op	Redwood	op	Black			3 cl	Brite Navy	on White
	IIIbb3	L	op	Redwood	op	Black			4 cl	Brite Navy	on White
	IIIbb4	L	op	Redwood	cl	Apple Green			3 op	Black	on White
	IIIbb5	L	op	Redwood	cl	Apple Green			3 cl	Brite Navy	on White
	IIIbb6	L	op	Black	cl	Lt. Gray			3 op	Redwood	on White
	IIIbb7	L	cl	Brite Navy	cl	Brite Navy	op	White	3 op	Redwood	on White
	IIIbb8	L	cl	Brite Navy	cl	Brite Navy	op	White	3 cl	Aqua Blue	on White

a few editorial adjustments and comments. Thanks are extended to the Ontario Service Centre of Parks Canada, Ottawa, for permission to reprint this important document.

2. This was never published.

3. "Wire-wound" beads are now generally simply referred to as "wound."

4. While some wound beads were imparted complex shapes in two-part molds (molded wound), a distinct mold-pressed category exists and has been well described by Neuwirth (1994, 2011). The principal difference between the two is that in the former case, a wound bead is pressed in a two-piece mold while in a viscid state on the mandrel. To produce a mold-pressed bead, the molten end of a glass rod is pressed in a mold.

Table 5. Continued.

Type	Bead Number	Size	Glass	Outside Colour Name	Glass	Core Colour Name	Glass	Middle Layer Colour Name
IIIc	IIIc1	L	cl	Brite Blue	cl	Brite Blue	op	White
	IIIc2	L	tr	Shadow Blue	cl	Lt. Gray	op	White
	IIIc3	L	cl	Brite Navy	cl	Lt. Gray	op	White
IIIc′	IIIc′1	L	op	Redwood	op	Black		
	IIIc′2	L	op	Redwood	cl	Apple Green		
	IIIc′3	L	cl	Turquoise	op	Redwood	op	White
	IIIc′4	L	cl	Turquoise	cl	Brite Navy	op	White
IIIe	IIIe1	M	op	Redwood	op	Black		
	IIIe2	M	cl	Lt. Gray	cl	Lt. Gray	op	Redwood
IIIe′	IIIe′1	M	op	Redwood	op	Black		
IIIf	IIIf1	L	cl	Lt. Gray	tr	Oyster White		
	IIIf2	L	cl	Ultramarine	tr	Lt. Aqua Blue		

Tube "Star" Beads (The Layers are Named from the Outside Inward)

Type IIIk "Star" Tube Bead with Plain Outside Layer

Type	Bead Number	Size	Glass	Outside		2nd		3rd		4th		5th	
IIIk	IIIk1	VL	op	Redwood	op	White	cl	Brite Blue	op	White	cl	Brite Blue	(*1)
	IIIk2	L	cl	Teal Green	op	White	op	Redwood	op	Black			(*2)
	IIIk3	S	cl	Brite Navy	op	White	op	Redwood	op	White	cl	Brite Blue	(*3)

*1 Outside layer very thick. Ends of bead slightly milled.

*2 Outside layer thin so ridges of next layer show through like stripes.

*3 Ends of bead ground to point to show design of inner layers.

Type IIIm True "Star" Bead (Large tube ground down to round or oval form to show ridges of next layer and end design of inner layers). Beads occur in size from Small to Very Large–up to 2½" long.

Type	Bead Number	Glass	Outside	2nd	3rd	4th	5th	6th	7th
IIIm	IIIm1	cl	Brite Blue	op White	op Redwood	op White cl	Brite Blue	op White cl	Brite Blue

Type IIIn "Star" Tube Bead with Stripes Inlayed in Outside Layer

Type	Bead Number	Glass	Outside	2nd	3rd	4th	5th	Stripes		
IIIn	IIIn1	tr	Oyster White	op White	op Redwood	op White cl	Lt. Gray	6	op	Redwood
								6	cl	Brite Navy
	IIIn2	tr	Oyster White	op White	op Redwood	op White cl	Brite Blue	6	op	Redwood
								6	cl	Brite Navy
	IIIn3	tr	Oyster White	op Redwood	op White	op White cl	Brite Blue	4	op	Redwood
								4	cl	Dk. Palm Green
								4	cl	Brite Navy

Table 6. Description of Class IV Beads.

Type	Bead Number	Shape	Size	Glass	Outside Name of Colour	Core Glass	Core Name of Colour	Middle Layer Glass	Middle Layer Name of Colour
IVa	IVa1	R	M	op	Redwood	op	Black		
	IVa2	R	VS	op	Redwood	cl	Lt. Gray		
		R	S	op	Redwood	cl	Lt. Gray		
		R	M	op	Redwood	cl	Lt. Gray		
		R	L	op	Redwood	cl	Lt. Gray		
	IVa3	C	M	op	Redwood	cl	Lt. Gray		
	IVa4	O	S	op	Redwood	cl	Lt. Gray		
	IVa5	R	VS	op	Redwood	cl	Apple Green		
		R	S	op	Redwood	cl	Apple Green		
		R	M	op	Redwood	cl	Apple Green		
		R	L	op	Redwood	cl	Apple Green		
	IVa6	C	M	op	Redwood	cl	Apple Green		
	IVa7	O	M	op	Redwood	cl	Apple Green		
	IVa8	R	M	op	Redwood	cl	Brite Blue		
	IVa9	R	VS	cl	Scarlet	op	White		
		R	S	cl	Scarlet	op	White		
	IVa10	R	M	op	Black	op	Black	op	White
	IVa11	C	M	cl	Lt. Gray	cl	Lt. Gray	op	White
	IVa12	C	M	cl	Lt. Gray	cl	Lt. Gray	op	Brite Navy (Bead Appears Blue)
	IVa13	C	S	tr	Oyster White	cl	Lt. Gray		
		C	M	tr	Oyster White	cl	Lt. Gray		
	IVa14	C	M	tr	Oyster White	cl	Lt. Aqua Blue		
	IVa15	R	M	cl	Apple Green	cl	Apple Green	op	White
	IVa16	R	M	op	Robin's Egg Blue	op	Robin's Egg Blue	op	White
	IVa17	C	M	cl	Ultramarine	cl	Ultramarine	op	White
	IVa18	R	M	cl	Brite Navy	cl	Lt. Gray		
	IVa19	C	M	cl	Brite Navy	cl	Brite Navy	op	White

The authors also fail to include blown and wound-on-drawn beads, as well as the somewhat problematic Prosser-molded beads which are generally considered to be ceramic but often have a high silica content and appear to be glass. These are discussed in the accompanying article, "Guide to the Description and Classification of Glass Beads found in the Americas."

5. The term "chevron" is preferred to "star."

6. Unfortunately, this did not occur. Nevertheless, numerous new types and varieties have been recorded since this was written and the new types are described in the accompanying Guide.

7. There is an error here. Overlaid should read Inlaid. The W group has been greatly expanded with more specific definitions provided for the WIII type beads (*see* the Guide mentioned above).

SELECT BIBLIOGRAPHY

For those who may wish to investigate this subject further, the following selected titles are offered. There is not, so far as the authors know, an entirely satisfactory treatment of the making of glass beads in English, and it is necessary to piece the story together from various sources, such as Dillon, Nesbitt, and Pellatt, after having first read a general exposition of glassmaking such as may be found in Marston. Those who are able to do so may wish to go further afield and examine the writing of some of the more outstanding continental authors. The subject becomes complicated at this point because numerous writers have discussed the manufacture of glass objects (though seldom beads specifically), and some of the more important are of considerable antiquity, e.g., Kunckel, Neri, and Theophilus. Unfortunately, these last three are not easily obtainable. The publications of Morazzoni and Pasquato, Pazaurek, and Zecchin, however, are recent and perhaps the most satisfactory for the readers of this article. [Editor's note:

Table 6. Continued.

					Body of Bead					Simple Stripes		
Type	Bead Number	Shape	Size	Glass	Outside Colour	Glass	Core Colour	Glass	Middle Colour	Number of Stripes Colour of Stripes Type of Glass		
IVb	IVb1	R	M	op	Redwood	op	Black			8	op	Black
	IVb2	R	M	op	Redwood	cl	Lt. Gray			11	op	Black
	IVb3	R	M	op	Redwood	op	Black			3	op	Broad White
	IVb4	R	M	op	Redwood	op	Black			6	op	White (3 Pairs)
	IVb5	R	L	op	Redwood	op	Black			6	op	White
	IVb6	R	S	op	Redwood	op	Black			8	op	White
	IVb7	R	L	op	Redwood	op	Black			12	op	White
	IVb8	R	L	op	Redwood	op	Black	op	White	4	op	White
	IVb9	R	S	op	Redwood	cl	Brite Blue			8	op	White
	IVb10	R	M	op	Redwood	cl	Apple Green			3	op	White
		R	L	op	Redwood	cl	Apple Green			3	op	White
	IVb11	R	L	op	Redwood	cl	Apple Green			6	op	White
	IVb12	R	S	cl	Scarlet	op	White			8	op	White (4 Pairs)
	IVb13	R	M	op	White	cl	Lt. Aqua			6	op	Redwood
	IVb14	C	S	op	White	cl	Lt. Gray			4	op	Redwood 4 op Black
	IVb15	C	S	op	White	cl	Lt. Gray			4	op	Redwood 4 cl Br. Navy
	IVb16	C	S	op	White	cl	Lt. Aqua Blue			3	op	Redwood 3 cl Br. Navy
	IVb17	C	S	op	White	cl	Lt. Gray			2	op	Black 2 tr Lt. Aqua Blue
	IVb18	R	M	cl	Apple Green	cl	Apple Green	op	White	3	op	White
	IVb19	R	M	cl	Apple Green	cl	Apple Green	op	White	3	cl	Lemon Yellow
	IVb20	R	M	cl	Dk. Palm Green	cl	Apple Green	op	White	6	op	White
	IVb21	R	M	cl	Teal Green	cl	Lt. Gray			4	op	White
	IVb22	R	M	cl	Lt. Aqua Blue	cl	Lt. Aqua Blue	op	Lemon Yellow	3	op	Lemon Yellow
	IVb23	R	S	cl	Shadow Blue	cl	Lt. Gray			3	op	Redwood
	IVb24	R	L	cl	Dk. Shadow Blue	cl	Lt. Gray			6	op	Redwood
	IVb25	R	VL	cl	Ultramarine	cl	Lt. Aqua Blue	op	White	16	op	White
	IVb26	R	VL	cl	Brite Navy	cl	Lt. Aqua Blue	op	White	16	op	White
	IVb27	R	M	cl	Brite Navy	op	Redwood	op	White	3	op	Lemon Yellow
										3	op	Lt. Cherry Rose
	IVb28	R	M	cl	Brite Navy	op	Redwood	op	White	4	op	Redwood
										4	op	White
										4	op	Lemon Yellow
	IVb29	R	M	cl	Brite Navy	cl	Brite Navy	op	White	3	op	White
	IVb30	R	L	cl	Brite Navy	cl	Brite Navy	op	White	3	op	Broad White
	IVb31	R	S	cl	Brite Navy	cl	Brite Navy	op	White	6	op	White
		R	M	cl	Brite Navy	cl	Brite Navy	op	White	6	op	White
	IVb32	R	L	cl	Brite Navy	cl	Brite Navy	op	White	7	op	White
	IVb33	R	M	cl	Brite Navy	cl	Brite Navy	op	White	16	op	White (8 Pairs)
	IVb34	R	M	cl	Brite Navy	cl	Brite Navy	op	White	16	op	White
	IVb35	R	L	cl	Dk. Navy	cl	Dk. Navy	op	White	8	op	White
	IVb36	R	VL	cl	Dk. Navy	cl	Dk. Navy	op	White	12	op	White
	IVb37	R	L	cl	Dk. Rose Brown	cl	Dk. Rose Brown	op	White	12	op	White

Keep in mind that this was written in the late 1950s; a lot has been published since then but this bibliography shows the state of knowledge at that time. To increase the value of this bibliography, several titles have been added. These are marked with an asterisk (*).]

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Table 6. Continued.

					Body of Bead					Surface Decoration	
Type	Bead Number	Shape	Size	Glass	Outside Colour Name	Glass	Core Colour Name	Glass	Middle Colour	Type Colour Name	
										Compound Stripes	
IVbb	IVbb1	R	M	op	Redwood	op	Black			3 Black	on White
	IVbb2	R	M	op	Redwood	cl	Lt. Gray			3 Black	on White
	IVbb3	R	M	op	Redwood	cl	Apple Green			3 Black	on White
	IVbb4	R	L	op	Redwood	op	Black			3 Brite Navy	on White
	IVbb5	O	S	op	Redwood	op	Black			3 Brite Navy	on White
	IVbb6	R	M	op	Redwood	cl	Lt. Gray			3 Brite Navy	on White
	IVbb7	R	M	op	Redwood	cl	Apple Green			3 Brite Navy	on White
	IVbb8	O	M	op	Redwood	cl	Apple Green			3 Brite Navy	on White
	IVbb9	R	M	cl	Brite Navy	cl	Brite Navy	op	White	3 Redwood	on White
	IVbb10	R	M	cl	Brite Navy	cl	Brite Navy	op	White	3 Redwood Pairs	on White
	IVbb11	R	L	cl	Dk. Rose Brown	op	Black	op	White	3 Brite Navy	on White
										Simple Stripes	
IVb′	IVb′1	O	M	cl	Apple Green	cl	Apple Green	op	White	3 op White	
										Compound Stripes	
IVbb′	IVbb′1	R	L	cl	Brite Navy	cl	Brite Navy	op	White	3 Redwood	on White
										"Flush Eyes"	
IVg	IVg1	O	M	cl	Brite Blue	cl	Brite Blue	op	White	3 Redwood Stars Dots on Brite Blue Dots	on White

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Table 6. Continued.

In Recording "Star" Beads the Layers are Named from the Outside Inward

Layers:				Outside		Body of Bead 2nd		3rd		4th
Type	Bead Number	Size	Glass	Colour Name	Glass	Colour Name	Glass	Colour Name	Glass	Colour Name
Milled "Star" Beads with Plain Outside Layer										
IVk	IVk1	L	op	Redwood	op	White	cl	Brite Blue	op	White
	IVk2	M	cl	Brite Navy	op	White	cl	Brite Blue	op	White
	IVk3	M	cl	Brite Navy	op	White	op	Redwood	op	White
	IVk4	L	cl	Brite Navy	op	White	op	Redwood	op	White
	IVk5	F	cl	Brite Navy	op	White	op	Redwood	op	White
	IVk6	M	cl	Dk. Palm Green	op	White	op	Redwood	op	White
	IVk7	L	cl	Dk. Palm Green	op	White	op	Redwood	op	White
Milled "Star" Beads with Stripes Inlaid in Outside Layer										
IVn	IVn1	M	tr	Oyster White	op	White	op	Redwood	op	White
	IVn2	M	tr	Oyster White	op	White	op	Redwood	op	White
	IVn3	L	tr	Oyster White	op	White	op	Redwood	op	White
	IVn4	M	tr	Oyster White	op	White	op	Redwood	op	White
	IVn5	M	tr	Oyster White	op	White	op	Redwood	op	White
	IVn6	L	tr	Oyster White	op	White	op	Redwood	op	White
	IVn7	F	tr	Oyster White	op	White	op	Redwood	op	White
Milled "Star" Beads which look like Porcelain Imitations of IVn Beads										
IVnn	IVnn1	VL	op	Redwood	op	White	op	Redwood		
	IVnn2	VL	op	Redwood	op	White	op	Redwood		
	IVnn3	VL	op	Black	op	White	op	Black		
	IVnn4	VL	op	White	op	Redwood	op	White	op	Redwood
	IVnn5	VL	op	White	op	Redwood	op	White	cl	Brite Blue

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Table 6. Continued.

	5th	Simple Stripes and Comments about Individual Beads Number of Stripes and their Colours
Glass	Colour Name	
cl	Brite Blue	Like IIIk1 but Milled Round
cl	Lt. Gray	Outside layer very thin making ridges of next layer appear as stripes
cl	Brite Blue	Outside layer very thin making ridges of next layer appear as stripes
cl	Brite Blue	Outside layer thick giving a solid blue appearance to surface
cl	Brite Blue	Like above bead but flattened
cl	Lt. Gray	
cl	Brite Blue	

Glass	Colour Name									
		Simple Stripes								
cl	Lt. Gray	6	op	Broad Redwood	6	cl	Thin Dk. Palm Green			
cl	Lt. Gray	6	op	Redwood	6	cl	Brite Navy			
cl	Brite Blue	6	op	Redwood	6	cl	Brite Navy			
cl	Lt. Gray	6	cl	Lemon Yellow	6	cl	Brite Navy			
cl	Lt. Gray	6	cl	Dk. Palm Green	6	cl	Brite Navy			
cl	Lt. Gray	4	op	Redwood	4	cl	Dk. Palm Green	4	cl	Brite Navy
cl	Lt. Gray	4	op	Redwood	4	cl	Dk. Palm Green	4	cl	Brite Navy

		Simple Stripes								
		8	op	White						
		6	op	White	6	cl	Brite Navy			
		8	op	Lt. Gold						
		6	op	Broad Redwood	6	cl	Thin Brite Navy			
		6	op	Broad Redwood	6	cl	Thin Brite Navy			

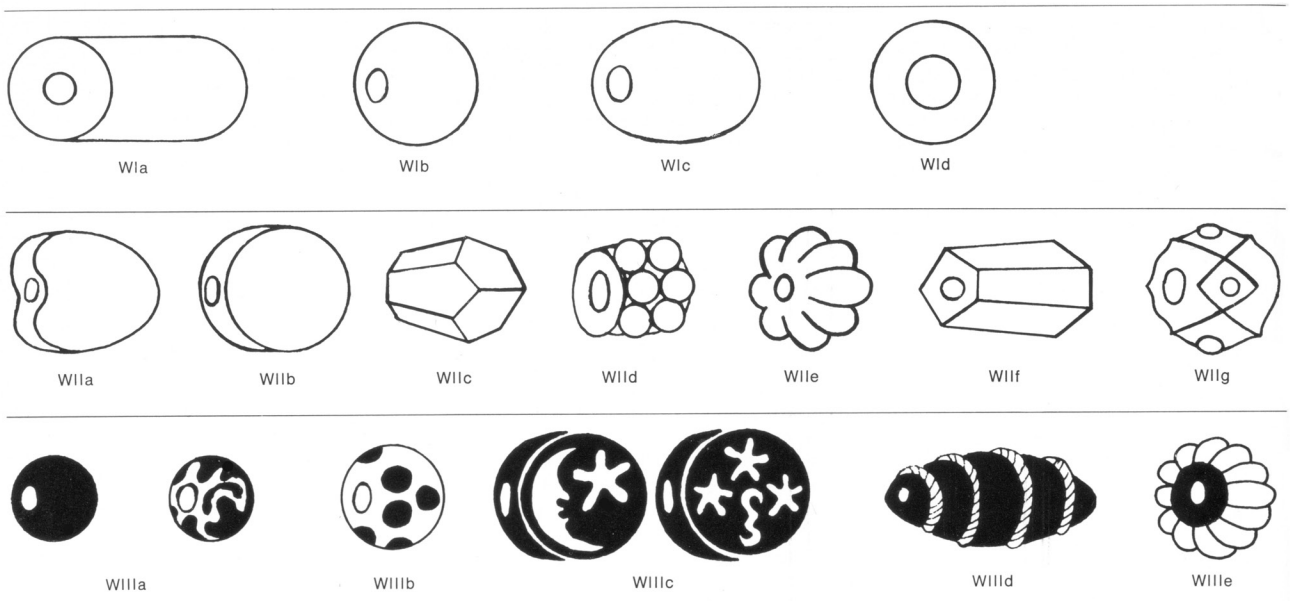

Figure 4. Master identification chart for wire-wound beads.

Table 7. Description of Class W Beads.

"Tube"

Type	Bead Number	Shape	Size	Glass	Name of Colour
WIa	WIa1	T	L	cl	Lt. Gray
	WIa2	T	M	cl	Oyster White
	WIa3	T	M	op	White

"Round"

Type	Bead Number	Shape	Size	Glass	Name of Colour
WIb	WIb1	R	L	cl	Lt. Gray
	WIb2	R	VS	op	White
		R	S	op	White
		R	M	op	White
	WIb3	R	M	cl	Pale Blue
	WIb4	R	M	cl	Pale Blue (Opal)
		R	L	cl	Pale Blue (Opal)
		R	VL	cl	Pale Blue (Opal)
	WIb5	R	M	tr	Pale Blue (Alabaster)
		R	L	tr	Pale Blue (Alabaster)
		R	VL	tr	Pale Blue (Alabaster)
	WIb6	R	S	cl	Lt. Gold
		R	M	cl	Lt. Gold
	WIb7	R	VS	cl	Amber
		R	L	cl	Amber
	WIb8	R	L	cl	Maple
		R	VL	cl	Maple
	WIb9	R	S	cl	Dk. Palm Green
	WIb10	R	VS	op	Lt. Aqua Blue
		R	M	op	Lt. Aqua Blue
	WIb11	R	VS	op	Robin's Egg Blue
		R	S	op	Robin's Egg Blue
		R	M	op	Robin's Egg Blue
	WIb12	R	L	op	Brite Blue
	WIb13	R	VS	op	Brite Copan Blue
		R	L	op	Brite Copan Blue
	WIb14	R	VS	op	Brite Dutch Blue
		R	L	op	Brite Dutch Blue
	WIb15	R	L	cl	Ultramarine
	WIb16	R	L	cl	Brite Navy

"Oval"

Type	Bead Number	Shape	Size	Glass	Name of Colour
WIc	WIc1	O	S	op	White
	WIc2	O	L	cl	Pale Blue (Opal)
	WIc3	O	VL	tr	Pale Blue (Marble)
	WIc4	O	L	cl	Lt. Gold
	WIc5	O	L	cl	Amber
	WIc6	O	S	cl	Maple
	WIc7	O	S	cl	Citron
	WIc8	O	L	cl	Turquoise
	WIc9	O	S	op	Aqua Blue
	WIc10	O	L	op	Lt. Aqua Blue
	WIc11	O	L	cl	Ultramarine

"Donut"

Type	Bead Number	Shape	Size	Glass	Name of Colour
WId	WId1	DO	L	cl	Amber
	WId2	DO	L	cl	Maple
	WId3	DO	L	cl	Turquoise
	WId4	DO	L	cl	Amethyst

"Corn Beads"

Type	Bead Number	Glass	Name of Colour
WIIa	WIIa1	cl	Lt. Gold
	WIIa2	op	Surf Green
	WIIa3	cl	Dk. Palm Green

Flat "Disk" Beads

Type	Bead Number	Glass	Name of Colour
WIIb	WIIb1	cl	Ultramarine

Table 7. Continued.

Facetted "Five Sided" Beads

Type	Bead Number	Glass	Name of Colour
WIIc	WIIc1	op	Black
	WIIc2	cl	Lt. Gray
	WIIc3	cl	Pale Blue (Opal)
	WIIc4	cl	Lt. Gold
	WIIc5	cl	Amber
	WIIc6	cl	Cinnamon
	WIIc7	cl	Teal Green
	WIIc8	cl	Turquoise
	WIIc9	cl	Lt. Aqua Blue
	WIIc10	cl	Brite Copan Blue
	WIIc11	cl	Ultramarine
	WIIc12	cl	Brite Navy
	WIIc13	cl	Amethyst

"Raspberry Beads"

Type	Bead Number	Glass	Name of Colour
WIId	WIId1	cl	Lt. Gray
	WIId2	cl	Pale Blue (Opal)
	WIId3	cl	Lt. Gold
	WIId4	cl	Amber
	WIId5	cl	Ultramarine
	WIId6	cl	Brite Navy
	WIId7	cl	Amethyst

"Melon" Beads

Type	Bead Number	Glass	Name of Colour
WIIe	WIIe1	cl	Lt. Gray
	WIIe2	cl	Lt. Gold
	WIIe3	cl	Amber
	WIIe4	cl	Cinnamon
	WIIe5	cl	Teal Green
	WIIe6	cl	Brite Copan Blue
	WIIe7	cl	Ultramarine
	WIIe8	cl	Brite Navy

"Ridged Tube" Beads

Type	Bead Number	Size	Glass	Name of Colour
WIIf	WIIf1	M	cl	Lt. Gold
	WIIf2	L	cl	Maple
	WIIf3	M	cl	Apple Green
	WIIf4	M	op	Surf Green
	WIIf5	L	cl	Turquoise

Round Bead with Pressed Design

Type	Bead Number	Size	Glass	Name of Colour
WIIg	WIIg1	M	cl	Lt. Gold
	WIIg2	M	cl	Apple Green

WIII Type is any Wirewound bead of WI or WII Type with applied Decoration

	Type	Bead Number	Glass	Colour	Decoration
Solid Plain Glass Overlay	WIIIa	WIIIa1	tr	White	with op Coral Plain Coating
		WIIIa2	tr	White	with cl Amethyst Plain Coating
Plain Glass Overlaid in a Design	WIIIb	WIIIb1	tr	White	with 3 groups of 3 cl Dk. Palm Green Dots
Plain Glass Inlaid in a Design[7]	WIIIc	WIIIc1	cl	Ultramarine	— A Side; 3 five pointed stars and comet — B Side; Man in the moon and five pointed star
		WIIIc2	cl	Ultramarine	— A Side; 3 five pointed stars with "S" growing out of top star — B Side; Crescent Moon connected to cross (Variation of WIIIc1)
Complex Designed Glass Overlay	WIIId	WIIId1	cl	Ruby	Large Oval with fine cane of op White & cl Brite Navy twisted together applied in a spiral around bead
Overlay of Material Other than Glass	WIIIe	WIIIe1	op	Black	"Melon" with Gold Leaf Overlay