

Seventeenth Century Dutch Beads

ABSTRACT

During the 1960s, the late Dr. W.G.N. van der Sleen of Naarden, The Netherlands, published a number of reports that dealt with Amsterdam's 17th century glass bead industry (Sleen 1962-67). While these reports presented a general description of the 17th century beads that had been collected in and around Amsterdam, a detailed list of the various types was lacking. Because such a list could be useful to historical archaeologists for dating and possibly determining the origin of the beads in their collections, the author visited the Instituut voor Zuid-Aziatische Archeologie in Amsterdam in November of 1972, to catalog and photograph the beads recovered by van der Sleen from ten sites in The Netherlands (Figure 1), as well as to further research the Dutch bead industry. The results of this work are presented herein.

Although all the beads in the van der Sleen collection are surface finds, associated artifacts at the two most productive sites (Boeren-Wetering and 's-Graveland) suggest that the beads were manufactured during the first half of the 17th century. Furthermore, many of the more distinctive bead types in the collection have counterparts at North American sites that date to the late 16th through early 18th centuries. Thus, their 17th century provenience seems assured.

It is also fairly certain that the majority of the beads were manufactured in Holland and not imported from elsewhere. This is indicated by the bead manufacturing debris found at the Boeren-Wetering and Keizersgracht sites. The chemical composition of the beads also suggests that they are of Dutch manufacture (Sleen 1963a:173).

However, since it is possible that some of the beads in the van der Sleen collection were produced in another country or at a later date, further research is required to determine which of the beads described on the following pages

are not of 17th century Dutch origin. It is, therefore, hoped that others will be able to conduct detailed chemical analyses of the van der Sleen specimens, and to analyze other such collections in The Netherlands and the other bead-producing countries of Europe. The collective results of these studies will not only show exactly what bead types were being produced in 17th century Holland, but will also provide comparative chemical data which can be used to determine the country of origin of the beads found at North American sites.

The Dutch Bead Industry

Although glass factories were already operating in Holland in the 15th century, the glass industry in that country blossomed only after the arrival of trained Italian glassblowers starting in the last half of the 16th century (Hudig 1923). Subsequently, numerous glasshouses sprang up in various parts of Holland and produced glass which was of very fine quality and competed with the products of Venice until 1750, when the collapse of the Dutch glass industry set in (Hudig 1923:104). However, according to Fer-rand Hudig's (1923) treatise on the Dutch glass industry, only six of these factories are documented as having produced glass beads (Figure 1). All of these were in operation during the period from 1597 to ca. 1697.

The first Dutch glass beads were apparently manufactured in Middleburg, a town on the west coast of The Netherlands 77 km. to the southwest of The Hague. There, in 1597, Govaert van der Haghe established a glassworks for the manufacture of glasses after the fashion of Antwerpen and long colored glass tubes for the manufacture of beads (Hudig 1923:24). Van der Haghe died in 1605, and was succeeded by Antonio Miotti, a member of a famous Venetian glass and bead manufacturing family (Hudig 1923:25). In 1623, Miotti established new factories in Brussels and Namur (Hudig 1923:27), and apparently abandoned the Middleburg factory. No mention of bead production in Middleburg is made after this date.

Amsterdam was the next city in Holland to

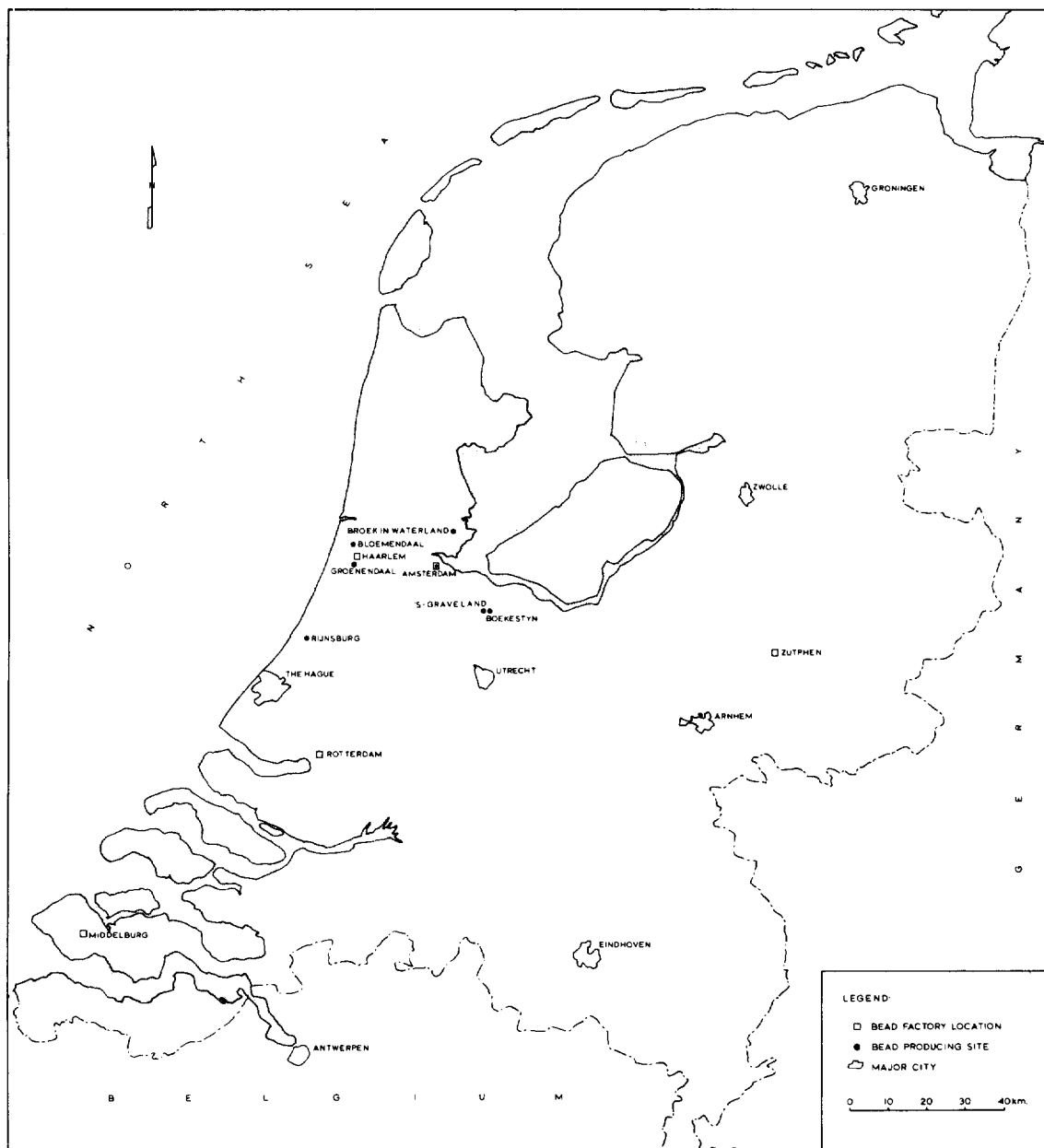


FIGURE 1. Map of The Netherlands showing the locations of sites producing 17th century beads and the factories that may have made them.

manufacture beads. There, ca. 1603, Jan Hendriksz Schryver (Soop) began making drinking glasses, crystal mirrors and glass beads (*pater-nosterwerke*) using experienced glass workers brought from Antwerpen, Murano and Venice (Hudig 1923:33-5). By 1613, over 80 families

were employed in the production of beads which, along with mirrors, were important items for trade with uncivilized peoples (Hudig 1923:35; Sleen 1964:234). However, in that same year, Abraham van Tongerloos started a mirror factory, and in 1622, Claes Rochus started a

glasshouse which became the base for the greatest glassworks in Amsterdam (Hudig 1923:36). The competition from these concerns was stiff and by 1633, Schryver had left Amsterdam (Hudig 1923:36). His business was subsequently taken over by Willem Schryver, Jr. (Hudig 1923:36), but it is not known if beads continued to be made or how long the enterprise lasted.

The second factory in Amsterdam to make glass beads was erected by Nicolas Jaques in 1656 on the Keizersgracht, a canal on the west side of the city (Hudig 1923:45). In 1665, this glasshouse was removed to the Rozengracht (Hudig 1923:45), a canal just to the west of the former. Nothing else is known about this concern.

Another glassworks on the Rozengracht which produced beads was already operating in 1660 (Hudig 1923:46). This establishment, apparently initiated by Claes Claesz Jaquet, also made all sorts of bottles, wine and beer glasses, glass balls, and various other objects after the fashion of Venice (Hudig 1923:46, 51, 55). These items were made by workers imported from Venice and Liège (Hudig 1923:53). In 1676, the Rozengracht factory became inactive but was soon reopened by Fredericq Rihel and Anthony Maire who then had the only active glass plant in Amsterdam (Hudig 1923:55). The new operation produced glass beads, and wine and beer glasses for export to England, Moscow, and several eastern countries (Hudig 1923:56). In 1679, the plant was transferred to Haarlem (Hudig 1923:56), an action which apparently brought an end to bead manufacturing in Amsterdam.

The Haarlem factory produced glass beads, as well as fine glass objects, using workers from the defunct Amsterdam plant (Hudig 1923:77). In 1686, Juane and Giacomo Pallada took over as managers of the glassworks and were producing tubular beads (*pypcoraelen*), among other things (Hudig 1923:79). The Haarlem glassworks apparently operated until 1697 (Hudig 1923:81).

Rotterdam was another bead-producing city. Hendrick van den Heuvel and Cretentius Thomer established a glasshouse there in 1615,

in order to produce glass beads, drinking glasses, and other glass products (Hudig 1923:59). In 1634, this glassworks' patent was extended for nine years (Hudig 1923:59). Unfortunately, no other information on this factory is available.

Zutphen, a town 72 km. east of Utrecht, may also have been a bead producing center. There, in 1689, it appears that Matthieu Simony de Tournay, a Frenchman, opened a glass factory in order to make glass beads imitating all sorts of precious stones for the Dutch and English overseas trade, as well as window glass, drinking glasses, goblets, and bottles (Hudig 1923:86, 88, 94). However, it is not certain whether Simony actually produced all the items that he intended to make (Hudig 1923:94). Thus, it is impossible to say with certainty that Zutphen was a source of beads. In any event, the operation was short lived—Simony left Zutphen in debt in 1692 (Hudig 1923:95).

Apparently, beads were not produced in Holland after the 17th century, probably because the Dutch could not compete with the low prices of other bead-producing countries (Hudig 1923:104–17). While letters written in 1717/18 and 1727 by James Logan (a Philadelphia merchant involved in the Indian trade) mention that he was obtaining beads from Holland (Kidd 1957:86–7) and seemingly contradict the previous statement, it is by no means certain that the beads were being manufactured there. German glass factories already had their representatives in Holland shortly after 1713, and Bohemian glasshouses had warehouses in numerous Dutch cities during the 18th century (Hudig 1923:114). Thus, it is quite possible that these two bead-producing countries were making the beads that were being supplied by Holland during the early 18th century.

Bead Producing Sites in Holland

The beads described in this report were recovered from the following sites:

Boeren-Wetering. This site, a vegetable garden, is now under the R.A.I. Congress and Exhibition Hall complex which is located at the south edge of Amsterdam, just to the east of the

Boeren-Wetering canal. Before the garden was destroyed, it yielded 151 glass bead types represented by 219 specimens, 12 of which are deformed or consist of two beads fused together; four non-glass beads; nine fragments of colored glass rods such as were used in the manufacture of wound beads and the decoration of drawn beads; and several pieces of op. redwood (6ne; 7.5R 4/6) and tsp. light emerald green (21 ga; 10G 7/6) glass slag. Also recovered were fragments of pale green glassware; much Chinese porcelain; German stoneware dating back to 1635; Delft majolica dated 1644; dozens of pipe bowls of the small type which date to the period from 1600 to 1650; and just about everything else that would be included in the refuse of a 17th century Dutch city (Sleen: unpublished notes). These associated items suggest that the beads date to the first half of the 17th century. Since there is no documentary evidence for a glasshouse or warehouse in this area, it is likely that all this material was in local refuse which was used to fertilize the gardens around Boeren-Wetering during the early 17th century.

Keizersgracht. In 1935, the remains of a glasshouse were uncovered while digging house foundations at Keizersgracht no. 292-294 (Sleen: unpublished notes) on the west side of Amsterdam's business district, ca. 0.5 km. to the southwest of the Royal Palace-Dam Square complex. The artifacts recovered from the excavated material included 14 intact and fragmentary glass beads representing 10 types, one small piece of tsp. olive (1 ni; 10Y 4/4) bottle glass, and two pieces of glass slag—one tsp. apple green (23 ic; 10GY 6/6); the other tsp. bright blue (16 1c; 5B 5/7). These items were mixed with modern material and are not necessarily associated with the glasshouse. However, the majority of the beads have counterparts at the other sites and are of types that can be attributed to the 17th century.

Schinkelhaven. Thirteen glass beads of 7 types were recovered from a "bead garden" (*kralentuin*) which once existed near the Broekerhuis on the Schinkelhaven, a street at the west end of Vondel Park in southwest Amsterdam. All the beads are of types that can

be attributed to the 17th century and were probably recovered from areas in and around Amsterdam.

's-Graveland. Several fields in the vicinity of 's-Graveland, a village 18 km. southeast of Amsterdam, produced 84 glass bead types represented by 152 specimens, including a number of deformed specimens. Associated with the beads were very small clay pipe bowls dating to 1600-50, Chinese Ming and Japanese Imari porcelain, Delft majolica and blue German stoneware, blue stone jugs inscribed with dates such as 1626, 1630, and 1644, around the coat of arms of Amsterdam, and other items (Sleen 1963:172; 1964:234) that suggest that the beads date to the first half of the 17th century.

All this material was apparently in the refuse, ash, and sewage brought from Amsterdam to the Bussum-Hilversum region in the 17th century to fertilize the gardens of the Dutch elite who had their summer houses and castles in the area (Sleen 1963:172-3; 1967:110). The numerous barges that brought the fertilizer were returned loaded with sand for use in the expansion and construction of Amsterdam, a task that preoccupied that city's government during the entire 17th century (Hudig 1923:45; Sleen 1963:173).

Boekesteijn. Forty-seven glass beads representing two types were recovered from Boekesteijn, a small village just to the northeast of 's-Graveland. These beads were probably brought here in the same manner as outlined for 's-Graveland.

Broek in Waterland. Thirty-four beads of 10 types were collected from the last bead garden in Broek in Waterland, a village about 8 km. to the northeast of Amsterdam. The specimens are of types that can be generally attributed to the 17th century and were probably manufactured in Amsterdam.

Saxenburg. The garden of the Old Cloister Saxenburg near Bloemendaal, a town just to the west of Haarlem and 12 km. west-north-west of Amsterdam, yielded 50 glass beads of four types. It is possible that these specimens were produced at the Haarlem glassworks which operated from 1679 to ca. 1697, and were in refuse brought from that town to fertilize the gardens

and fields in the Bloemendaal region.

Velserend. Eleven "ridged tube" beads were recovered from the garden of Café Velserend in Bloemendaal. These may also have been manufactured in Haarlem during the late 1600s.

Groenendaal. Two bead types were found in Groenendaal, a suburb of Heemstede which is just to the south of Haarlem and about 8 km. west of Amsterdam. Again, it is possible that these beads were made in Haarlem.

Rijnsburg. Eight glass beads representing two types were found near the church in Rijnsburg, a town 29 km. southwest of Amsterdam and 12 km. northeast of The Hague. Seven of the beads (type IVa5) are strung on sections of a brass chain and are probably from a rosary. It is not certain where these specimens were produced. No glass factories are recorded as having been in this area in the 17th or 18th centuries. The specimens, especially those on the chain, may have been dropped by persons visiting the church. However, both the recovered types (IVa5 and WIb15) have counterparts at several of the other sites and may be 17th century Dutch beads.

Inventory of Bead Types

The van der Sleen collection contains four non-glass beads and 550 classifiable glass beads representing 226 distinct types. The glass specimens are classified using the system developed by Kenneth and Martha Kidd (1970) to facilitate comparisons of bead assemblages, and their identifying code precedes the detailed description of each bead type. Bead types in the collection that do not appear in the Kidds' lists are marked by an asterisk (*) since they do not, as yet, have type numbers.

Following the description of each bead type are the names of the sites that produced the type with the number of specimens recovered from each site in parentheses.

The color, size, and shape notations used herein correspond to those employed by the Kidds. Colors are designated using the names and codes in the *Color Harmony Manual* (Jacobson, *et al.* 1948). The equivalent color

code in the Munsell color notation system (Munsell Color Company 1960) is also provided for the benefit of those who may not be familiar with the manual.

The size categories used refer to bead diameter and have the following numerical values: very small, under 2mm.; small, 2mm. to 4mm.; medium, 4mm. to 6mm.; large, 6mm. to 10mm.; very large, over 10mm. However, because this sizing system provides only a minimum of information, the exact diameter and length range of each bead type is also presented to increase the comparative value of this report.

While the shape nomenclature is basically self-explanatory, a few brief comments will help clarify some of the terms used. All *tubular* beads have round cross-sections unless otherwise noted. *Circular* specimens are shaped like a torus (ring), i.e. the shape of most embroidery (seed, pound, and pony) beads. The *round* category includes beads which are not only spheroidal, but also oblate and barrelshaped. *Flat* beads are oval or round specimens which were pressed flat parallel to the perforation while the glass was still viscid.

The diaphaneity of the beads is described using the terms opaque, translucent, and transparent. Although the Kidds use "clear" in lieu of "transparent," the latter term is used herein since it is felt to be more descriptive. Simply defined, beads that are *opaque* are impenetrable to light except on the thinnest edges. *Translucent* specimens transmit light, yet diffuse it so that objects viewed through them are indistinct. Objects viewed through *transparent* beads are clearly visible.

Drawn Beads

Drawn beads are those which were made from sections of glass tubing which were drawn out from a hollow globe of molten glass. Their ends may be broken, or rounded by subsequent reheating and agitation.

1a—Tubular, monochrome beads.

1al. Tubular; small to large size; opaque, redwood

(6 ne; 7.5R 4/6). Broken ends. Boeren-Wetering (2); Keizersgracht (1).

Diameter: 3.0–7.5 mm.

Length: 29.0–63.5 mm.

Ia2. Tubular; large size; opaque, black (p; N 1/0). Broken ends. Boeren-Wetering (1).

Diameter: 8.5 mm. Length: 34 mm.

Ia3. Tubular; medium size; transparent, light gray (c; N 8/0). Rounded ends. 's-Graveland (1).

Diameter: 4.1 mm. Length: 6.8 mm.

Ia21. Tubular; small size; transparent, rose wine (8 le; 10RP 4/6). Saxenburg (2).

Diameter: 3.0–3.2 mm.

Length: 10–15 mm.

*Ia**. Tubular; medium size; translucent, shadow blue (14 ie; 2.5PB 5/4). Broken ends; numerous linear bubbles in glass. Boeren-Wetering (2).

Diameter: 4.0–5.6 mm.

Length: 16–38 mm.

*Ia**. Tubular; medium size; opaque, mist blue (15 ge; 10B 6/3). Rounded ends. 's-Graveland (1).

Diameter: 5.5 mm. Length: 11 mm.

*Ia**. Tubular; small size; transparent, slate blue (15 ig; 10B 5/3). Slightly rounded ends. Boeren-Wetering (1).

Diameter: 4 mm. Length: 14 mm.

*Ia**. Tubular; large size; translucent, cerulean blue (15 nc; 10B 5/8). Rounded ends. Boeren-Wetering (1).

Diameter: 6.5 mm. Length: 21 mm.

*Ia**. Tubular; large size; translucent, medium shadow blue (16 lg; 7.5B4/3). Well rounded ends; numerous linear bubbles in glass. Boeren-Wetering (1).

Diameter: 7.5 mm. Length: 10 mm.

*Ia**. Tubular; small to medium size; transparent, bright blue (16 lc; 5B 5/7). Rounded ends; numerous linear bubbles in glass. Boeren-Wetering (1); 's-Graveland (1).

Diameter: 3–6 mm. Length: 10–12 mm.

*Ia**. Tubular; medium size; transparent, medium turquoise blue (17 le; 2.5B 5/5). Slightly rounded ends; numerous linear bubbles in glass. Keizersgracht (1).

Diameter: 5 mm. Length: 34 mm.

Ib—Tubular beads having monochrome bodies decorated with straight, simple stripes.

Ib2. Tubular; large size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 6 straight, opaque, white (a; N 10/0) stripes. Broken, jagged ends. Boeren-Wetering (1).

Diameter: 7 mm. Length: 34 mm.

Ib5. Tubular; medium size; opaque, black (p; N 1/0) body decorated with 3 opaque, redwood (6 ne; 7.5R

4/6) and 3 opaque, white (a; N 10/0), alternating, straight stripes. Broken ends. Boeren-Wetering (1).

Diameter: 6 mm. Length: 45 mm.

*Ib**. Tubular; medium size; opaque, mustard tan (2 lg; 5Y 5/4) body decorated with 8 straight, redwood (6 ne; 7.5R 4/6) stripes. Broken ends. Boeren-Wetering (1).

Diameter: 5 mm. Length: 16 mm.

*Ib**. Tubular; medium size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 2 straight, white (a; N 10/0) stripes. Broken ends. Boeren-Wetering (1).

Diameter: 4.8 mm. Length: 42 mm.

*Ib**. Tubular; small size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 3 straight, white (a; N 10/0) stripes. Broken ends. Boeren-Wetering (1).

Diameter: 3.5 mm. Length: 10 mm.

*Ib**. Tubular; very large size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 11 straight, white (a; N 10/0) stripes. Broken ends. Boeren-Wetering (1).

Diameter: 11 mm. Length: 21 mm.

*Ib**. Tubular; large size; opaque, redwood (6 le; 7.5R 5/6) body decorated with 15 narrow, straight, white (a; N 10/0) stripes. Broken, jagged ends. Boeren-Wetering (1).

Diameter: 9 mm. Length: 10 mm.

*Ib**. Tubular; large size; opaque, deep red brown (6½ pl; 10R 2/4) body decorated with 8 straight, redwood (6 ne; 7.5R 4/6) stripes. Broken, uneven ends. Boeren-Wetering (1).

Diameter: 10 mm. Length: 13 mm.

*Ib**. Tubular; large size; transparent, bright navy (13 pg; 7.5PB 3/4) body decorated with 16 narrow, straight, redwood (6 ne; 7.5R 4/6) stripes. Broken ends. Boeren-Wetering (1).

Diameter: 7 mm. Length: 12 mm.

*Ib**. Tubular; large and very large size; opaque, shadow blue (14 ie; 2.5PB 5/4) body decorated with 8 straight, redwood (6 ne; 7.5R 4/6) stripes. Ends broken. Boeren-Wetering (3); Keizersgracht (1).

Diameter: 6.8–10.5 mm.

Length: 10–26 mm.

*Ib**. Tubular; very large size; opaque, shadow blue (14 ie; 2.5PB 5/4) body decorated with 16 straight, redwood (6 ne; 7.5R 4/6) stripes. Ends broken and jagged. Boeren-Wetering (1).

Diameter: 12 mm. Length: 13 mm.

*Ib**. Tubular; medium size; opaque, pale blue (15 ca; 10B.9/3) body decorated with 3 redwood (6 ne; 7.5R 4/6) and 3 open blue (13½ ic; 5 PB 5/7), alternating, straight stripes. Ends broken. 's-Graveland (1).

Diameter: 4.5 mm. Length: 29.5 mm.

*Ib**. Tubular; large size; translucent, pale blue (15 ca; 10B 9/3) body decorated with 8 redwood (6 ne; 7.5R 4/6) and 8 bright dutch blue (13 la; 7.5PB 5/11),

alternating, narrow straight stripes. Broken ends. 's-Graveland (1).

Diameter: 8 mm. Length: 11 mm.

*Ib**. Tubular; large size; transparent, cerulean blue (15 nc; 10B 5/8) body decorated with 3 broad, straight, white (a; N 10/0) stripes. Ends broken; numerous linear bubbles in glass. Boeren-Wetering (1).

Diameter: 9.5 mm. Length: 16 mm.

*Ib**. Tubular; very large size; opaque, light gray blue (16 ge; 7.5B 6/2) body decorated with 8 redwood (6 ne; 7.5R 4/6) and 8 bright navy (13 pg; 7.5PB 3/4), alternating, straight stripes. Ends broken and jagged. Boeren-Wetering (2).

Diameter: 10–11 mm.

Length: 13.5–14 mm.

*Ib**. Tubular; medium size; transparent, light blue spruce (20 ge; 7.5 BG 6/3) body decorated with 4 redwood (6 ne; 7.5R 4/6) and 4 white (a; N 10/0), alternating, narrow, straight stripes. Broken ends. Boeren-Wetering (1).

Diameter: 5 mm. Length: 35 mm.

*Ib**. Tubular; large size; opaque, black (p; N 1/0) body decorated with 7 straight, white (a; N 10/0) stripes. Rounded ends. 's-Graveland (1).

Diameter: 7 mm. Length: 44 mm.

*Ib**. Tubular; medium size; opaque, black (p; N 1/0) body decorated with 5 redwood (6 ne; 7.5R 4/6) and 5 white (a; N 10/0), alternating, straight stripes. Rounded ends. Boeren-Wetering (1).

Diameter: 5 mm. Length: 11 mm.

Ibb—Tubular beads having monochrome bodies decorated with straight, compound stripes.

Ibb2. Tubular; small and medium size; opaque, black (p; N 1/0) body decorated with 3 straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Broken ends. Saxenburg (17).

Diameter: 2.8–5.5 mm.

Length: 8–23.5 mm.

*Ibb**. Tubular; small size; opaque, shadow blue (14 ie; 2.5Pb 5/4) body decorated with 3 narrow, straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Broken ends. Boeren-Wetering (1).

Diameter: 4 mm. Length: 15 mm.

*Ibb**. Tubular; small size; translucent, pale blue (15 ca; 10B 9/3) body decorated with 3 straight, compound stripes of copen blue (13½ ic; 5PB 5/7) on redwood (6 ne; 7.5R 4/6). Ends broken. 's-Graveland (1).

Diameter: 4 mm. Length: 13 mm.

*Ibb**. Tubular; medium size; opaque, slate blue (15 ig; 10B 5/3) body decorated with 3 straight, compound stripes of broad redwood (6 le; 7.5R 5/6) on white (a; N 10/0). Broken ends. Boeren-Wetering (1).

Diameter: 6 mm. Length: 13 mm.

*Ibb**. Tubular; small size; translucent, oyster white (b; N 9/0) body decorated with 4 narrow, straight, compound stripes of white (a; N 10/0) on redwood (6 ne; 7.5R 4/6). Broken ends. 's-Graveland (1).

Diameter: 3.5 mm. Length: 14 mm.

*Ibb**. Tubular; small and medium size; opaque, black (p; N 1/0) body decorated with 4 straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Broken ends. Saxenburg (3).

Diameter: 3.9–4.8 mm.

Length: 14–16.5 mm.

*Ibb**. Tubular; large size; opaque, black (p; N 1/0) body decorated with 4 straight, compound stripes of sunlight yellow (1½ ga; 5Y 8/8) bordered by redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Very slightly rounded ends. Boeren-Wetering (1).

Diameter: 6.5 mm. Length: 19 mm.

Ib'—Tubular beads having monochrome bodies decorated with spiral, simple stripes.

Ib'2. Tubular; large size; opaque, white (a; N 10/0) body decorated with 3 sets of 3 spiral, bright navy (13 pg; 7.5 PB 3/4) stripes. Broken, uneven ends. Boeren-Wetering (1); Keizersgracht (1).

Diameter: 6.5 mm. Length: 26 mm.

*Ib'**. Tubular; large size; opaque, pale blue (15 ca; 10B 9/3) body decorated with 3 sets of 3 spiral, bright navy (13 pg; 7.5 PB 3/4) stripes. Ends broken; numerous spiral bubbles in glass. Boeren-Wetering (1).

Diameter: 7.8 mm. Length: 28 mm.

*Ib'**. Tubular; medium size; opaque, white (a; N 10/0) body decorated with 3 redwood (6 ne; 7.5R 4/6) and 4 bright navy (13 pg; 7.5PB 3/4) spiral stripes. The colors alternate except at one point where two bright navy stripes are adjacent to each other. Broken ends. Boeren-Wetering (1).

Diameter: 6 mm. Length: 25 mm.

Ibb'—Tubular beads having monochrome bodies decorated with spiral, compound stripes.

*Ibb'**. Tubular; large size; opaque, black (p; N 1/0) body decorated with 3 spiral, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Broken, jagged ends. Boeren-Wetering (1).

Diameter: 7 mm. Length: 23 mm.

*Ibb'**. Tubular; large size; opaque, shadow blue (14 ie; 2.5PB 5/4) body decorated with 3 spiral, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Broken ends. Boeren-Wetering (1).

Diameter: 7 mm. Length: 28 mm.

*Ibb'**. Tubular; medium size; opaque, slate blue (15ig; 10B 5/3) body decorated with 3 spiral, compound stripes of narrow white (a; N 10/0) on redwood (6 ne; 7.5R 4/6). Ends broken; many spiral bubbles in

glass. Boeren-Wetering (1).

Diameter: 5.5 mm. Length: 16 mm.

Ila—Non-tubular, monochrome beads.

Ila7. Circular; medium size; opaque, black (p; N 1/0). 's-Graveland (1).

Diameter: 6 mm. Length: 4.8 mm.

Ila13. Round; large size; opaque, white (a; N 10/0). 's-Graveland (1).

Diameter: 8 mm. Length: 9.5 mm.

Ila14. Circular; medium size; opaque, white (a; N 10/0). 's-Graveland (6).

Diameter: 4–5.1 mm.

Length: 2.9–3.3 mm.

Ila31. Round; large size; transparent, turquoise (17 pa; 10BG 5/7). Numerous linear bubbles in glass. Boeren-Wetering (1).

Diameter: 10 mm. Length: 9 mm.

Ila43. Round; medium to very large size; translucent, bright blue (16 lc; 5B 5/7). Abundant linear bubbles in glass. A broken projection at one end of the largest specimen suggests that the bead was pinched from a viscid tube. Boeren-Wetering (3); 's-Graveland (1).

Diameter: 4–15.5 mm.

Length: 3.3–15 mm.

Ila44. Round; large size; transparent, cerulean blue (15 nc; 10B 5/8). Boeren-Wetering (1).

Diameter: 7.0 mm. Length: 8.0 mm.

Ila46. Round; medium and large size; opaque, shadow blue (14 ie; 2.5PB 5/4). Numerous linear bubbles in glass. Boeren-Wetering (1); 's-Graveland (1).

Diameter: 4.5–9 mm.

Length: 4–8 mm.

Ila47. Circular; small and medium size; opaque, shadow blue (14 ie; 2.5PB 5/4). Boeren-Wetering (3); 's-Graveland (4).

Diameter: 3–6 mm.

Length: 2–4.5 mm.

Ila48. Round; very large size; opaque, dark shadow blue (15 ni; 10B 3/3). Abundant linear bubbles in glass. Boeren-Wetering (1).

Diameter: 13 mm. Length: 7 mm.

Ila53. Circular; small and medium size; transparent, ultramarine (13 pa; 7.5PB 4/14). 's-Graveland (4).

Diameter: 2.5–5 mm.

Length: 2.1–4.8 mm.

Ila55. Round; large size; transparent, bright navy (13 pg; 7.5PB 3/4). Boeren-Wetering (1).

Diameter: 7 mm. Length: 6 mm.

Ila57. Oval; large size; transparent, bright navy (13 pg; 7.5PB 3/4). Boeren-Wetering (2).

Diameter: 6.8–7 mm.

Length: 10–14 mm.

*Ila**. Circular; medium size; transparent, light gray (c; N 8/0). 's-Graveland (2).

Diameter: 5–5.6 mm.

Length: 2.5–4 mm.

*Ila**. Circular; small size; opaque, sunlight yellow (1½ ga; 5Y 8/8). 's-Graveland (1).

Diameter: 3 mm. Length: 1.2 mm.

*Ila**. Circular; medium size; opaque, light gold (2 ic; 2.5Y 7/7). 's-Graveland (1).

Diameter: 4.5 mm. Length: 4.5 mm.

*Ila**. Round; medium size; opaque, copen blue (13½ ic; 5PB 5/7). 's-Graveland (1).

Diameter: 4.5 mm. Length: 5 mm.

*Ila**. Circular; medium size; opaque, copen blue (13½ ic; 5PB 5/7). 's-Graveland (2).

Diameter: 4–5 mm.

Length: 3.5–4 mm.

*Ila**. Oval; large size; opaque, shadow blue (14 ie; 2.5PB 5/4). Boeren-Wetering (2); 's-Graveland (1).

Diameter: 7.5–9 mm.

Length: 17 mm.

*Ila**. Circular; medium size; opaque, mist blue (15 ge; 10B 6/3). 's-Graveland (1).

Diameter: 5 mm. Length: 2.8 mm.

*Ila**. Round; small size; opaque, slate blue (15 ig; 10B 5/3). Boeren-Wetering (2).

Diameter: 4 mm. Length: 5 mm.

*Ila**. Oval; large size; opaque, slate blue (15 ig; 10B 5/3). Boeren-Wetering (1).

Diameter: 8 mm. Length: 14 mm.

*Ila**. Circular; small size; translucent, slate blue (15 ig; 10B 5/3). 's-Graveland (1).

Diameter: 4 mm. Length: 2.5 mm.

*Ila**. Round; medium and large size; translucent, cerulean blue (15 nc; 10B 5/8). Numerous linear bubbles in glass. Boeren-Wetering (7).

Diameter: 4–10 mm.

Length: 4–9.5 mm.

*Ila**. Oval; medium size; translucent, cerulean blue (15 nc; 10B 5/8). Boeren-Wetering (1).

Diameter: 5 mm. Length: 8.5 mm.

*Ila**. Round; large size; transparent, robin's egg blue (16 ic; 5B 6/6). 's-Graveland (1).

Diameter: 7 mm. Length: 5 mm.

*Ila**. Circular; medium size; translucent, bright blue (16 lc; 5B 5/7). Boeren-Wetering (1).

Diameter: 5 mm. Length: 3 mm.

*Ila**. Oval; large size; translucent, bright blue (16 lc; 5B 5/7). Numerous linear bubbles in glass. Boeren-Wetering (1).

Diameter: 6.5 mm. Length: 15 mm.

*Ila**. Round; large size; transparent, bright blue (16 lc; 5B 5/7). Numerous linear bubbles in glass. 's-Graveland (2).

Diameter: 6–8 mm. Length: 6–8 mm.

*Ila**. Circular; small size; transparent, bright blue (16 lc; 5B 5/7). 's-Graveland (1).

Diameter: 2.1 mm. Length: 1.8 mm.

*Ila**. Round; large size; transparent, aqua blue (18 gc; 2.5B 7/4). Numerous linear bubbles in glass. A small projection of glass at either end of one bead suggests that it was pinched from a viscid tube. 's-Graveland (5).

Diameter: 7–7.5 mm.

Length: 4–9 mm.

*Ila**. Circular; medium size; transparent, aqua blue (18 gc; 2.5B 7/4). 's-Graveland (2).

Diameter: 4–4.1 mm.

Length: 3–4.7 mm.

*Ila**. Oval; large size; opaque, pale green (22 ca; 2.5G 9/3). Boeren-Wetering (2).

Diameter: 6–7.5 mm

Length: 10–13.5 mm.

*Ila**. Circular; very small and small size; transparent, apple green (23 ic; 10GY 6/6). 's-Graveland (2).

Diameter: 1.9–2.1 mm.

Length: 1.2 mm.

Ilb—Non-tubular beads having monochrome bodies decorated with straight, simple stripes.

Ilb5. Round; large size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 6 straight, white (a; N 10/0) stripes. Boekesteijn (1).

Diameter: 10 mm. Length: 10 mm.

Ilb6. Round; large size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 8 straight, white (a; N 10/0) stripes. Boeren-Wetering (1).

Diameter: 10 mm. Length: 9.5 mm.

Ilb18. Round; medium and large size; transparent, light gray (c; N 8/0) "gooseberry" beads decorated with 13 to 18 straight, white stripes (the stripes are actually fine linear bubbles in the glass near the surface of the bead). 's-Graveland (5).

Diameter: 5–8.1 mm.

Length: 4–8 mm.

Ilb27. Round; large size; opaque, white (a; N 10/0) body decorated with 3 sets of 3 straight, bright navy (13 pg; 7.5PB 3/4) stripes. A small, broken projection at one end of the bead suggests that it was pinched from a viscid tube. Boeren-Wetering (1).

Diameter: 8.5 mm. Length: 9.5 mm.

Ilb28. Oval; medium size; opaque, white (a; N 10/0) body decorated with 3 sets of 3 straight, bright navy (13 pg; 7.5PB 3/4) stripes. Boeren-Wetering (1).

Diameter: 5.8 mm. Length: 12 mm.

Ilb39. Round; large size; opaque, white (a; N 10/0) body decorated with 6 straight, alternating stripes: 2 dark palm green (23 ni; 10GY 4/4), 2 redwood (6 ne; 7.5R 4/6), and 2 bright navy (13 pg; 7.5PB 3/4). Boeren-Wetering (2).

Diameter: 7.5–8 mm.

Length: 5.6–6.5 mm.

Ilb48. Round; very large size; opaque, mustard tan (2 lg; 5Y 5/4) body decorated with 8 straight, redwood (6 ne; 7.5R 4/6) stripes. Boeren-Wetering (1).

Diameter: 12 mm. Length: 12.5 mm

*Ilb**. Round; large size; opaque, black (p; N 1/0) body decorated with 7 straight, white (a; N 10/0) stripes. 's-Graveland (1).

Diameter: 6.8 mm. Length: 5 mm.

*Ilb**. Round; large and very large size; opaque, black (p; N 1/0) body decorated with 8 straight, white (a; N 10/0) stripes. Boeren-Wetering (2); 's-Graveland (2).

Diameter: 7–12.5 mm.

Length: 4.5–11.5 mm.

*Ilb**. Oval; large size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 6 broad, straight, light gold (2 ic; 2.5Y 7/7) stripes. Boeren-Wetering (1).

Diameter: 9 mm. Length: 13.5 mm.

*Ilb**. Round; very large size; opaque, olive (1 ni; 10Y 4/4) body decorated with 8 straight, bright navy (13 pg; 7.5PB 3/4) stripes. Boeren-Wetering (1).

Diameter: 14 mm. Length: 14.5 mm.

*Ilb**. Round; very large size; transparent, bright navy (13 pg; 7.5PB 3/4) body decorated with 8 narrow, straight, redwood (6 ne; 7.5R 4/6) stripes. Numerous bubbles in glass. Boeren-Wetering (1).

Diameter: 11 mm. Length: 11 mm.

*Ilb**. Round; large and very large size; opaque, shadow blue (14 ie; 2.5PB 5/4) body decorated with 8 straight, redwood (6 ne; 7.5R 4/6) stripes. Boeren-Wetering (4).

Diameter: 7.5–11 mm.

Length: 7–11 mm.

*Ilb**. Round; very large size; translucent, cerulean blue (15 nc; 10B 5/8) body decorated with 4 straight, white (a; N 10/0) stripes. Abundant linear bubbles in glass. Boeren-Wetering (2).

Diameter: 10 mm. Length: 8.5–10 mm.

*Ilb**. Round; very large size; opaque, light gray blue (16 ge; 7.5B 6/2) body decorated with 8 straight, redwood stripes. Boeren-Wetering (1).

Diameter: 11 mm. Length: 11 mm.

*Ilb**. Round; very large size; opaque, light gray blue (16 ge; 7.5B 6/2) body decorated with 8 redwood (6 ne; 7.5R 4/6) and 8 bright navy (13 pg; 7.5PB 3/4), alternating, straight stripes. Boeren-Wetering (4).

Diameter: 11–12 mm.

Length: 10–11 mm.

*Ilb**. Round; very large size; translucent, bright blue (16 lc; 5B 5/7) body decorated with 3 broad, straight, white (a; N 10/0) stripes. Abundant linear bubbles in glass; the perforation has a "pebbly" surface. 's-Graveland (1).

Diameter: 13 mm. Length: 10 mm.

*Iib**. Round; large size; opaque, dusty aqua blue (17 ec; 2.5B 7/2) body decorated with 3 narrow, straight, bright navy (13 pg; 7.5PB 3/4) stripes. Boeren-Wetering (1).

Diameter: 9 mm. Length: 9 mm.

*Iib**. Round; very large size; opaque, dusty aqua blue (17 ec; 2.5B 7/2) body decorated with 5 redwood (6 le; 7.5R 5/6), 5 dark palm green (23 ni; 10GY 4/4) and 5 bright navy (13 pg; 7.5PB 3/4), straight stripes. Boeren-Wetering (2).

Diameter: 14.5 mm. Length: 16 mm.

*Iib**. Oval; large size; translucent, bright turquoise (18 la; 10BG 6/8) body decorated with 3 straight, white (a; N 10/0) stripes. Numerous linear bubbles in glass. Boeren-Wetering (1).

Diameter: 8.1 mm. Length: 15 mm.

*Iib**. Oval; large size; opaque, dusty aqua green (19 ge; 7.5BG 6/2) body decorated with 4 redwood (6 ne; 7.5R 4/6) and 3 bright navy (13 pg; 7.5PB 3/4), straight stripes. Numerous linear bubbles in glass. Boeren-Wetering (1).

Diameter: 8.5 mm. Length: 11.5 mm.

*Iib**. Flat; very large size; opaque, sage green (24 li; 7.5GY 4/3) body decorated with 7 straight, redwood (6 ne; 7.5R 4/6) stripes. This type consists of a round bead pressed flat while still viscid. Boeren-Wetering (1).

Diameter: 5.2 mm. by 11.5 mm.

Length: 14 mm.

Iibb — Non-tubular beads having monochrome bodies decorated with straight, compound stripes.

Iibb1. Round; very large size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 3 straight, compound stripes of bright navy (13 pg; 7.5PB 3/4) on white (a; N 10/0). Boeren-Wetering (1).

Diameter: 12 mm. Length: 11 mm.

Iibb3. Round; very large size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 4 straight, compound stripes of bright navy (13 pg; 7.5PB 3/4) on white (a; N 10/0). Boeren-Wetering (2).

Diameter: 12–13.5 mm.

Length: 10.5–14.5 mm.

Iibb6. Oval; large size; opaque, black (p; N 1/0) body decorated with 3 straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Boeren-Wetering (2).

Diameter: 6.7–7.5 mm.

Length: 12–13.5 mm.

Iibb7. Round; very large size; opaque, black (p; N 1/0) body decorated with 3 very broad, straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Boeren-Wetering (1).

Diameter: 15.5 mm. Length: 12.5 mm.

*Iibb**. Oval; large size; opaque, white (a; N 10/0)

body decorated with 3 straight, compound stripes of bright dutch blue (13 la; 7.5PB 5/11) on redwood (6 ne; 7.5R 4/6). Boeren-Wetering (1).

Diameter: 8 mm. Length: 16 mm.

*Iibb**. Round; large and very large size; opaque, black (p; N 1/0) body decorated with 8 straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Boeren-Wetering (2).

Diameter: 8.5–10.5 mm.

Length: 8–9 mm.

*Iibb**. Round; very large size; opaque, black (p; N 1/0) body decorated with 4 broad, straight, light gold (2 ic; 2.5Y 7/7) stripes and 4 straight, broad, compound stripes of light gold bordered by redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Boeren-Wetering (1).

Diameter: 18 mm. Length: 12 mm.

*Iibb**. Round; very large size; opaque, redwood (6 ne; 7.5R 4/6) body decorated with 4 straight, white (a; N 10/0) stripes and 4 straight, compound stripes of white bordered by dark rose brown (7 pn; 5R 3/1) on light gold (2 ic; 2.5Y 7/7). Boeren-Wetering (1).

Diameter: 13 mm. Length: 14 mm.

*Iibb**. Oval; very large size; opaque, barn red (6 pg; 7.5R 3/6) body decorated with 4 broad, straight, compound stripes of black (p; N 1/0) on white (a; N 10/0). A small projection at either end of the bead suggests that it was pinched from a viscid tube. 's-Graveland (1).

Diameter: 13.5 mm. Length: 22 mm.

*Iibb**. Round; very large size; opaque, deep red brown (6½ pl; 10R 2/4) body decorated with 4 straight, light gold (2 ic; 2.5Y 7/7) stripes and 4 straight, compound stripes of light gold bordered by redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Boeren-Wetering (1).

Diameter: 11.5 mm. Length: 13 mm.

*Iibb**. Oval; large size; transparent, bright navy (13 pg; 7.5PB 3/4) body decorated with 3 straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Boeren-Wetering (2).

Diameter: 8.5–9 mm.

Length: 10.5–15 mm.

*Iibb**. Round; large size; opaque, shadow blue (14 ie; 2.5PB 5/4) body decorated with 3 straight, compound stripes of light gray blue (16 ge; 7.5B 6/2) on redwood (6 ne; 7.5R 4/6). 's-Graveland (1).

Diameter: 7 mm. Length: 6 mm.

*Iibb**. Oval; medium and large size; opaque, shadow blue (14 ie; 2.5PB 5/4) body decorated with 3 straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Boeren-Wetering (3); 's-Graveland (4).

Diameter: 5.8–8 mm.

Length: 8–15 mm.

*Iibb**. Round; large size; translucent, bright blue (16 lc; 5B 5/7) body decorated with 4 straight, com-

pound stripes of broad sunlight yellow (1½ ga; 5Y 8/8) bordered by very narrow redwood (6 ne; 7.5R 4/6) on white (a; N 10/0). Numerous linear bubbles in glass. Boeren-Wetering (1).

Diameter: 9 mm. Length: 6.5 mm.

IIb' — Non-tubular beads having monochrome bodies decorated with spiral, simple stripes.

IIIb'7. Oval; large size; opaque, white (a; N 10/0) body decorated with 3 sets of 3 spiral, bright navy (13 pg; 7.5PB 3/4) stripes. Boeren-Wetering (2); 's-Graveland (1).

Diameter: 7.1–8.5 mm.

Length: 14–20 mm.

IIIb'*. Round; very large size; opaque, black (p; N 1/0) body decorated with 9 narrow, spiral, white (a; N 10/0) stripes. Boeren-Wetering (1).

Diameter: 13 mm. Length: 8.5 mm.

IIIa — Tubular, polychrome (multi-layered) beads.

IIIa1. Tubular; small and medium size; opaque, redwood (6 ne; 7.5R 4/6) outer layer; opaque, black (p; N 1/0) core. Rounded ends. 's-Graveland (2).

Diameter: 3.8–5 mm.

sLength: 8.6–11 mm.

IIIa3. Tubular; medium and large size; opaque, redwood (6 ne; 7.5R 4/6) outer layer; transparent, apple green (23 ic; 10GY 6/6) to bright green (22 nc; 2.5G 5/9) core. Broken to rounded ends. Boeren-Wetering (2); 's-Graveland (1).

Diameter: 5.5–10 mm.

Length: 13–38 mm.

IIIa8. Tubular; small size; translucent, oyster white (b; N 9/0) outer layer; transparent, light gray (c; N 8/0) core. Broken ends. Keizersgracht (1).

Diameter: 3 mm. Length: 41 mm.

IIIa10. Tubular; large size; transparent, ultramarine (13 pa; 7.5PB 4/14) outer layer; opaque, white (a; N 10/0) middle layer; transparent, ultramarine (13 pa; 7.5PB 4/14) core. Broken ends. Boeren-Wetering (1).

Diameter: 7 mm. Length: 16 mm.

IIIa12. Tubular; small and large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; opaque, white (a; N 10/0) middle layer; transparent, bright navy core. Broken ends. Boeren-Wetering (4).

Diameter: 2.5–7.5 mm.

Length: 12–36 mm.

IIIa*. Tubular; large size; opaque, redwood (6 ne; 7.5R 4/6) outer layer; opaque, barn red (6 pg; 7.5R 3/6) core containing swirls of clear glass. Broken ends. 's-Graveland (2).

Diameter: 6–6.5 mm.

Length: 19–23 mm.

IIIa*. Tubular; large size; opaque, bright dutch blue (13 la; 7.5PB 5/11) outer layer; transparent, bright navy (13 pg; 7.5PB 3/4) core. Keizersgracht (1).

Diameter: 9.5 mm. Length: 20 mm.

IIIa*. Tubular; small size; transparent, copen blue (13½ ic; 5PB 5/7) outer layer; very thin, transparent, ultramarine (13 pa; 7.5PB 4/14) core. Numerous linear bubbles in glass. 's-Graveland (1).

Diameter: 2.5 mm. Length: 21 mm.

IIb — Tubular beads having polychrome (multi-layered) bodies decorated with straight, simple stripes.

IIIb9. Tubular; large and very large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 12–16 straight, white (a; N 10/0) stripes; opaque, white middle layer; transparent, bright navy core. Ends broken. Boeren-Wetering (3); 's-Graveland (2); Keizersgracht (1).

Diameter: 9–15 mm.

Length: 11.5–29 mm.

IIIb*. Tubular; medium size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 13 very narrow, straight, white (a; N 10/0) stripes; opaque, black (p; N 1/0) core. Broken ends. Boeren-Wetering (1).

Diameter: 6 mm. Length: 28 mm.

IIIb*. Tubular; small size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 8 narrow, straight, white (a; N 10/0) stripes; opaque, white middle layer; opaque, redwood (6 ne; 7.5R 4/6) core. Broken ends. Boeren-Wetering (1).

Diameter: 3.9 mm. Length: 7.5 mm.

IIIb*. Tubular; large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 14 straight, white (a; N 10/0) stripes; very thin, opaque, white middle layer; transparent, light aqua green (19 ea; 2.5B 8/4) core. Broken ends. 's-Graveland (1).

Diameter: 10 mm. Length: 5 mm.

IIIb*. Tubular; small size; opaque, shadow blue (14 ie; 2.5PB 5/4) outer layer decorated with 6 straight, redwood (6 ne; 7.5R 4/6) stripes; transparent, shadow blue (14 ie; 2.5PB 5/4) core. Broken ends. Boeren-Wetering (1).

Diameter: 3.1 mm. Length: 13 mm.

IIIb*. Tubular; large size; opaque, white (a; N 10/0) outer layer decorated with 2 redwood (6 ne; 7.5R 4/6) and 3 bright navy (13 pg; 7.5PB 3/4), alternating, straight stripes; transparent, medium shadow blue (16 lg; 7.5B 4/3) core. Broken, jagged ends. Boeren-Wetering (1).

Diameter: 6.5 mm. Length: 17 mm.

IIIb*. Tubular; small size; opaque, white (a; N 10/0) outer layer decorated with 3 redwood (6 ne; 7.5R 4/6) and 3 bright navy (13 pg; 7.5PB 3/4), alternating straight stripes; translucent, light gray (c; N 8/0) core. Broken ends. Keizersgracht (1).

Diameter: 3.5 mm. Length: 29 mm.

IIIbb - Tubular beads having polychrome (multi-layered) bodies decorated with straight, compound stripes.

IIIbb4. Tubular; small and medium size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 3 straight, compound stripes of black (p; N 1/0) on white (a; N 10/0); transparent, apple green (23 ic; 10GY 6/6) core. Broken ends. Boeren-Wetering (6); 's-Graveland (2); Saxenburg (28); Boekesteyn (46).

Diameter: 2.5–5 mm.

Length: 4.5–25 mm.

IIIbb*. Tubular; small size; opaque, white (a; N 10/0) outer layer decorated with 3 straight, compound stripes of sunlight yellow (1½ ga; 5Y 8/8) on copen blue (13½ ic; 5PB 5/7); very thin, opaque, redwood (6 ne; 7.5R 4/6) middle layer; opaque, white core. Broken ends. Boeren-Wetering (1).

Diameter: 4 mm. Length: 14.5 mm.

IIIbb*. Tubular; small and medium size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 3 straight, compound stripes of black (p; N 1/0) on white (a; N 10/0); opaque, black core. Broken ends. 's-Graveland (5).

Diameter: 3–4.5 mm.

Length: 13–31 mm.

IIIbb*. Tubular; medium size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 3 straight, compound stripes of black (p; N 1/0) on white (a; N 10/0); transparent, bright navy (13 pg; 7.5PB 3/4) core. Broken ends. Boeren-Wetering (1).

Diameter: 6 mm. Length: 45 mm.

IIIbb*. Tubular; medium size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 3 straight, compound stripes of bright navy (13 pg; 7.5PB 3/4) on white (a; N 10/0); transparent, bright blue (16 lc; 5B 5/7) core. Broken ends. Boeren-Wetering (1).

Diameter: 4.2 mm. Length: 12 mm.

IIIbb*. Tubular; very large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 8 straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0), and 1 straight, simple white stripe; opaque, white middle layer; transparent, bright navy core. Broken, relatively flat ends. Boeren-Wetering (1).

Diameter: 12.5 Length: 17 mm.

IIIb' — Tubular beads having polychrome (multi-layered) bodies decorated with spiral, simple stripes.

IIIb'*. Tubular; medium size; opaque, white (a; N 10/0) outer layer decorated with 4 spiral, redwood (6 ne; 7.5R 4/6) stripes; opaque, light gray (c; N 8/0) core. Broken, jagged ends. Boeren-Wetering (1).

Diameter: 6 mm. Length: 19 mm.

IIIb'*. Tubular; large size; opaque, white (a; N 10/0) outer layer decorated with 2 redwood (6 ne; 7.5R 4/6) and 2 copen blue (13½ ic; 5PB 5/7), spiral

stripes; opaque, pale blue (15 ca; 10B 9/3) core. Broken ends. 's-Graveland (1).

Diameter: 6.5 mm. Length: 29 mm.

IIIb'*. Tubular; medium size; opaque, white (a; N 10/0) outer layer decorated with 3 redwood (6 ne; 7.5R 4/6) and 4 copen blue (13½ ic; 5PB 5/7), spiral stripes; opaque, pale blue (15 ca; 10B 9/3) core. Broken ends. 's-Graveland (1).

Diameter: 5.5 mm. Length: 30 mm.

IIIb'*. Tubular; medium size; opaque, redwood (6 le; 7.5R 5/6) outer layer decorated with 3 spiral, white (a; N 10/0) stripes; opaque, barn red (6 pg; 7.5R 3/6) core containing swirls of clear glass. Broken ends. 's-Graveland (1).

Diameter: 5.5 mm. Length: 16 mm.

IIIb'*. Tubular; medium size; opaque, taupe brown (6 ni; 7.5R 3/2) outer layer decorated with 3 spiral, white (a; N 10/0) stripes; opaque, black (p; N 1/0) core. Broken ends. 's-Graveland (1).

Diameter: 6 mm. Length: 34.5 mm.

IIIbb'—Tubular beads having polychrome (multi-layered) bodies decorated with spiral, compound stripes.

IIIbb'*. Tubular; medium size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 3 narrow, spiral, compound stripes of redwood on white (a; N 10/0); transparent, apple green (23 ic; 10GY 6/6) core. Ends broken. 's-Graveland (1).

Diameter: 6 mm. length: 41 mm.

IIIbb'*. Tubular; medium size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 3 spiral, compound stripes, each with a different color combination: 1) sunlight yellow (1½ ga; 5Y 8/8) on white (a; N 10/0); 2) olive (1 ni; 10Y 4/4) on white; 3) aqua blue (18 gc; 2.5B 7/4) on white; opaque, black (p; N 1/0) core. Broken ends. Boeren-Wetering (1).

Diameter: 5.5 mm. Length: 22 mm.

IIIc—Tubular, polychrome (multi-layered) beads with square cross-sections.

IIIc*. Tubular (square cross-section); large size; transparent, cerulean blue (15 nc; 10B 5/8) outer layer; opaque, white (a; N 10/0) middle layer; transparent, cerulean blue core. Broken ends. Boeren-Wetering (1).

Diameter: 9.8 mm. Length: 18 mm.

IIIc*. Tubular (square cross-section); medium size; transparent, turquoise (17 pa; 10BG 5/7) outer layer; opaque, white (a; N 10/0) middle layer; transparent, bright navy (13 pg; 7.5PB 3/4) core. One end is broken; the other has had the corners ground down. Boeren-Wetering (1).

Diameter: 5 mm. Length: 31 mm.

IIIc*. Tubular (square cross-section); very large size; transparent, turquoise (17 pa; 10BG 5/7) outer

layer; opaque, white (a; N 10/0) middle layer; transparent, citron (1 gc; 10Y 7/4) core. Broken, jagged ends. Boeren-Wetering (1).

Diameter: 11 mm. Length: 15 mm.

IIIk—Tubular, multi-layered "star" beads with plain outer layers.

IIIk*. Tubular; small size; "star" bead with 3 "starry" layers: 1) transparent, ultramarine (13 pa; 7.5PB 4/14) outer layer; 2) opaque, white (a; N 10/0) middle layer; 3) opaque, redwood (6 ne; 7.5R 4/6) core. The ridges of the middle layer show through as straight stripes. Ends broken. Boeren-Wetering (1).

Diameter: 3 mm. Length: 9.5 mm.

IIIk*. Tubular; large size; "star" bead with 5 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; 4) opaque, white layer; and 5) opaque, redwood core. The ridges of the second layer show through as straight stripes. Ends broken. Boeren-Wetering (1).

Diameter: 6.5 mm. Length: 11 mm.

IIIk*. Tubular; very large size; "star" bead with 7 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; 4) opaque, white layer; 5) transparent, bright navy layer; 6) opaque, white layer; and 7) transparent, bright navy core. The ridges of the second layer do not show through the outer layer. Ends broken but flat. Boeren-Wetering (1).

Diameter: 11.6 mm. Length: 17.5 mm.

IIIkk—Tubular, multi-layered "pseudo-star" beads (all layers except the core are "starry") with plain outer layers.

IIIkk*. Tubular; small size; "pseudo-star" bead with 4 layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; and 4) opaque, white core. The ridges of the second layer show through as straight stripes. Broken ends. Boeren-Wetering (1).

Diameter: 3.5 mm. Length: 9.5 mm.

IIIm—Semi-tubular, true "star" beads; made by grinding large, multi-layered tubes into round or oval forms to show the ridges of the second layer and the end design of the various layers.

IIIm*. Semi-tubular (round); very large size; "star" bead with ground ends and 7 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; 4) opaque, white layer; 5)

opaque, redwood layer containing swirls of dark green glass; 6) opaque, white layer; and 7) opaque, redwood layer containing swirls of dark green glass. The ridges of the second layer show through as straight stripes. Boeren-Wetering (1).

Diameter: 26 mm. Length: 25.5 mm.

IIIm*. Semi-tubular (oval); medium size; "star" bead with ground ends and 4 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; and 4) opaque, pale blue (15 ca; 10B 9/3) core. The ridges of the second layer show through as straight stripes. Boeren-Wetering (1).

Diameter: 4.9 mm. Length: 6 mm.

IIIm*. Semi-tubular (oval); very large size; "star" bead with ground ends and 7 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; 4) opaque, white layer; 5) transparent, dark shadow blue (15 ni; 10B 3/3) layer; 6) opaque, white layer; and 7) transparent, dark shadow blue core. The ridges of the second layer show through as straight stripes. Large flat facets have been cut on the ends of the bead which appear to have been subsequently heated to round the edges of the facets. The ends are flat. Boeren-Wetering (1).

Diameter: 35 mm. Length: 43 mm.

IIInn—Tubular, multi-layered "star" beads decorated with straight, simple stripes on the outer layer. These beads look like porcelain imitations of class **III**n beads and are the tubular counterparts of class **IV**nn beads.

IIInn*. Tubular; very large size; decorated "star" bead with 4 "starry" layers: 1) opaque, white (a; N 10/0) outer layer decorated with 6 redwood (6 ne; 7.5R 4/6) and 6 bright navy (13 pg; 7.5PB 3/4), straight stripes; 2) opaque, redwood layer; 3) opaque, white layer; and 4) opaque, redwood core (one core contains swirls of dark green glass). Broken ends. Boeren-Wetering (5); 's-Graveland (1); Keizersgracht (4).

Diameter: 11–18 mm.

Length: 10.5–34 mm.

IIIp—Tubular, multi-layered "star" beads decorated with straight, simple stripes on the surface of the second layer.

IIIp*. Tubular; very large size; decorated "star" bead with 3 "starry" layers: 1) transparent, clear or light gray (c; N 8/0) outer layer; 2) opaque, pale blue (15 ca; 10B 9/3) middle layer decorated with 6 redwood (6 ne; 7.5R 4/6) and 6 bright navy (13 pg; 7.5PB 3/4), straight stripes; and 3) opaque, redwood core. Broken ends. Boeren-Wetering (1).

Diameter: 10.2 mm. Length: 13 mm.

*IIIp**. Tubular; very large size; decorated "star" bead with 5 "starry" layers; 1) thick, transparent, light aqua green (19 ea; 2.5B 8/4) outer layer; 2) opaque, white (a; N 10/0) layer decorated with 6 redwood (6 ne; 7.5R 4/6) and 6 bright navy (13 pg; 7.5PB 3/4), straight stripes; 3) opaque, redwood layer; 4) opaque, white layer; and 5) transparent, light aqua green core. Ends broken. Boeren-Wetering (1).

Diameter: 18 mm. Length: 34 mm.

IIIq—Tubular, multi-layered "pseudo-star" beads (all layers except the core are "starry") decorated with straight, simple stripes on the surface of the second layer.

*IIIq**. Tubular; very large size; decorated "pseudo-star" bead with 4 layers: 1) thick, transparent, clear or light gray (c; N 8/0) outer layer; 2) opaque, white (a; N 10/0) layer decorated with 6 redwood (6 le; 7.5R 5/6) and 6 bright navy (13 pg; 7.5PB 3/4) straight stripes; 3) opaque, redwood (6 le; 7.5R 5/6) layer; and 4) opaque, brick red (6½ ng; 7.5R 3/5) circular core. Broken ends. 's-Graveland (1).

Diameter: 12.5 mm. Length: 16 mm.

*IIIq**. Tubular; large size; decorated "pseudo-star" bead with 4 layers: 1) transparent, clear or light gray (c; N 8/0) outer layer; 2) opaque, white (a; N 10/0) layer decorated with 4 redwood (6 ne; 7.5R 4/6), 4 dark palm green (23 ni; 10GY 4/4) and 4 bright dutch blue (13 la; 7.5PB 5/11) straight stripes; 3) opaque, redwood layer; and 4) transparent, light aqua green (19 ea; 2.5B 8/4) circular core. Broken ends. Boeren-Wetering (1).

Diameter: 7.8 mm. Length: 11.5 mm.

IVa—Non-tubular, polychrome (multi-layered) beads.

IVa5. Round; medium and large size; opaque, redwood (6 ne; 7.5R 4/6) outer layer; transparent, apple green (23 ic; 10GY 6/6) core. Boeren-Wetering (1); 's-Graveland (6); Rijnsburg (7).

Diameter: 5–9 mm.

Length: 4.5–8.5 mm.

IVa6. Circular; small and medium size; opaque, redwood (6 le/ne; 7.5R 4–5/6) outer layer; transparent, apple green (23 ic; 10GY 6/6) core. 's-Graveland (6).

Diameter: 2.5–6 mm.

Length: 1.8–4.5 mm.

IVa17. Circular; small size; transparent, ultramarine (13 pa; 7.5PB 4/14) outer layer; opaque, white (a; N 10/0) middle layer; transparent, ultramarine core. Boeren-Wetering (1).

Diameter: 4 mm. Length: 2.5 mm.

*IVa**. Circular; small size; opaque, bright dutch

blue (13 la; 7.5PB 5/11) outer layer; transparent, ultramarine (13 pa; 7.5PB 4/14) core. This type is represented by a mass of fused beads recovered from 's-Graveland.

Diameter: 3–4 mm.

Length: 1.5–2 mm.

*IVa**. Round; large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; opaque, white (a; N 10/0) middle layer; transparent, pale blue (15 ca; 10B 9/3) core. A small projection at one end of the bead suggests that it was pinched from a viscid tube. 's-Graveland (1).

Diameter: 7.5 mm. Length: 6 mm.

*IVa**. Round; large size; transparent, dark palm green (23 ni; 10GY 4/4) outer layer; very thin, opaque, white (a; N 10/0) middle layer; transparent, light aqua green (19 ea; 2.5B 8/4) core. Boeren-Wetering (1).

Diameter: 7.2 mm. Length: 7 mm.

IVb—Non-tubular beads having polychrome (multi-layered) bodies decorated with straight, simple stripes.

IVb30. Round; large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 3 broad, straight, white (a; N 10/0) stripes; opaque, white middle layer; transparent, bright navy core. Boeren-Wetering (1).

Diameter: 7 mm. Length: 6 mm.

IVb34. Round; very large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 16 straight, white (a; N 10/0) stripes; opaque, white middle layer; transparent, bright navy core. Boeren-Wetering (3); Keizersgracht (1).

Diameter: 13.2 mm. Length: 13 mm.

IVb35. Round; very large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 8 straight, white (a; N 10/0) stripes; opaque, white middle layer; transparent, bright navy core. A large, broken projection at one end of the bead suggests that it was pinched from a viscid tube. Boeren-Wetering (1).

Diameter: 13 mm. Length: 13 mm.

*IVb**. Round; very large size; thin, opaque, white (a; N 10/0) outer layer decorated with 6 redwood (6 ne; 7.5R 4/6) and 6 bright navy (13 pg; 7.5PB 3/4), straight stripes; opaque, redwood core. Boeren-Wetering (2).

Diameter: 12 mm. Length: 11.5 mm.

*IVb**. Round; very large size; opaque, black (p; N 1/0) outer layer decorated with 12 straight, white (a; N 10/0) stripes; thin, opaque, old wine (7 ng; 5R 3/5) middle layer; opaque; black core. Boeren-Wetering (1).

Diameter: 19 mm. Length: 17 mm.

*IVb**. Round; large size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 16 narrow, straight, white (a; N 10/0) stripes; opaque, white mid-

dle layer; opaque, redwood core. Boeren-Wetering (1).

Diameter: 10 mm. Length: 12 mm.

*IVb**. Round; very large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 12 straight, white (a; N 10/0) stripes; opaque, white middle layer; transparent, bright navy core. 's-Graveland (2).

Diameter: 11–13 mm.

Length: 8–11.5 mm.

*IVb**. Round; very large size; transparent, dark shadow blue (15 ni; 10B 3/3) outer layer decorated with 16 straight, white (a; N 10/0) stripes; opaque, white middle layer; transparent, dark shadow blue core. Boeren-Wetering (1).

Diameter: 11 mm. Length: 13 mm.

*IVb**. Round; very large size; transparent, turquoise (17 pa; 10BG 5/7) outer layer decorated with 3 straight, light gold (2 ic; 2.5Y 7/7) stripes; opaque, white (a; N 10/0) middle layer; transparent, turquoise core. Numerous bubbles in glass. Boeren-Wetering (1).

Diameter: 15.5 mm. Length: 14 mm.

IVbb—Non-tubular beads having polychrome (multi-layered) bodies decorated with straight, compound stripes.

IVbb3. Round; large size; opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 3 straight, compound stripes of black (p; N 1/0) on white (a; N 10/0); transparent, apple green (23 ic; 10GY 6/6) core. 's-Graveland (2).

Diameter: 8–8.5 mm.

Length: 8–9 mm.

*IVbb**. Round; large size; transparent, maple (4 ng; 5YR 4/4) outer layer decorated with 3 broad, straight, compound stripes of bright navy (13 pg; 7.5PB 3/4) bordered by redwood (6 ne; 7.5R 4/6) bordered by white (a; N 10/0) bordered by redwood; opaque, white middle layer; transparent, robin's egg blue (16 ic; 5B 6/6) core. Boeren-Wetering (1).

Diameter: 9 mm. Length: 8 mm.

*IVbb**. Round; very large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 6 straight, compound stripes of bright navy bordered by redwood (6 ne; 7.5R 4/6) bordered by white (a; N 10/0)—the bright navy portion of the stripes consists of the body of the bead; opaque, white middle layer; transparent, bright navy core. Boeren-Wetering (1).

Diameter: 14 mm. Length: 9 mm.

*IVbb**. Round; large size; transparent, emerald green (21 nc; 7.5G 5/8) outer layer decorated with 5 straight, compound stripes of redwood (6 ne; 7.5R 4/6) on white (a; N 10/0); opaque, white middle layer; translucent, shadow blue (14 ie; 2.5PB 5/4) core. Boeren-Wetering (1).

Diameter: 7.1 mm. Length: 6.7 mm.

IVb'—Non-tubular beads having polychrome (multi-layered) bodies decorated with spiral, simple stripes.

IVb'. Oval; large size; transparent, bright navy (13 pg; 7.5PB 3/4) outer layer decorated with 3 narrow, spiral, white (a; N 10/0) stripes; opaque, white middle layer; transparent, bright navy core. Boeren-Wetering (1).

Diameter: 7.6 mm. Length: 11.5 mm.

IVk—Non-tubular, multi-layered "star" beads with plain outer layers.

IVk3. Round; large size; "star" bead with 5 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; 4) opaque, white layer; and 5) transparent, bright blue (16 lc; 5B 5/7) core. The ridges of the second layer show through the outer layer as straight stripes. Boeren-Wetering (4).

Diameter: 7.3–10 mm.

Length: 7–9 mm.

*IVk**. Oval; large size; "star" bead with 5 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; 4) opaque, white layer; and 5) transparent, bright blue (16 lc; 5B 5/7) core. The ridges of the second layer show through as straight stripes. Boeren-Wetering (3).

Diameter: 7–7.1 mm.

Length: 10–12.5 mm.

*IVk**. Flat; large size; "star" bead with 5 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; 4) opaque, white layer; and 5) transparent, bright blue (16 lc; 5B 5/7) core. The ridges of the second layer show through as straight stripes. Boeren-Wetering (2).

Diameter: 5mm. by 9.4–10 mm.

Length: 10.5–13 mm.

*IVk**. Round; large size; "star" bead with 5 "starry" layers: 1) transparent, bright green (22 nc; 2.5G 5/9) outer layer; 2) opaque, white (a; N 10/0) layer; 3) opaque, redwood (6 ne; 7.5R 4/6) layer; 4) opaque, white layer; and 5) transparent, bright green core. The ridges of the second layer show through as straight stripes. Boeren-Wetering (1).

Diameter: 8 mm. Length: 7.2 mm.

*IVk**. Round; large size; "star" bead with 3 "starry" layers: 1) transparent, bright navy (13 pg; 7.5PB 3/4) outer layer; 2) opaque, white (a; N 10/0) middle layer; and 3) opaque, redwood (6 ne; 7.5R 4/6) core. The ridges of the second layer do not show through as stripes. Boeren-Wetering (1).

Diameter: 6.5 mm. Length: 7 mm.

*IVk**. Round; large size; "star" bead with 3 "starry" layers: 1) transparent, turquoise green (20 nc;

5BG 5/8) outer layer; 2) opaque, white (a; N 10/0) middle layer; and 3) opaque, redwood (6 ne; 7.5R 4/6) core. The ridges of the second layer show through as straight stripes. Boeren-Wetering (1).

Diameter: 9 mm. Length: 9 mm.

IVnn—Non-tubular, multi-layered “star” beads decorated with straight, simple stripes on the outer layer. These beads look like porcelain imitations of class IVn beads.

IVnn4. Round; very large size; decorated “star” bead with 4 “starry” layers: 1) thin, opaque, white (a; N 10/0) outer layer decorated with 6 redwood (6 ne; 7.5R 4/6) and 6 bright navy (13 pg; 7.5PB 3/4), straight stripes; 2) opaque, redwood layer; 3) opaque, white layer; and 4) opaque, redwood core. Boeren-Wetering (2); 's-Graveland (1).

Diameter: 11–14 mm.

Length: 11–12.5 mm.

IVnn*. Round; very large size; decorated “star” bead with 3 “starry” layers: 1) opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 8 straight, white (a; N 10/0) stripes; 2) very thin, opaque, cerulean blue (15 nc; 10B 5/8) middle layer; and 3) opaque, redwood core. Boeren-Wetering (1).

Diameter: 13 mm. Length: 13 mm.

IVnn*. Oval; very large size; decorated “star” bead with 3 “starry” layers: 1) opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 8 straight, white (a; N 10/0) stripes; 2) very thin, opaque, cerulean blue (15 nc; 10B 5/8) middle layer; and 3) opaque, redwood core. Boeren-Wetering (1).

Diameter: 11.5 mm. Length: 16 mm.

IVnn*. Round; very large size; decorated “star” bead with 4 “starry” layers: 1) opaque, light gray blue (16 ge; 7.5B 6/2) outer layer decorated with 6 redwood (6 ne; 7.5R 4/6) and 6 bright navy (13 pg; 7.5PB 3/4), straight stripes; 2) opaque, redwood layer; 3) very thin, opaque, light gray blue layer; and 4) opaque, redwood core. Boeren-Wetering (1).

Diameter: 13 mm. Length: 9.5 mm.

IVnn'—Non-tubular, multi-layered “star” beads decorated with straight, compound stripes on the outer layer.

IVnn'*. Round; very large size; decorated “star” bead with 3 “starry” layers: 1) opaque, redwood (6 ne; 7.5R 4/6) outer layer decorated with 6 straight, compound stripes of bright navy (13 pg; 7.5PB 3/4) on white (a; N 10/0); 2) opaque, white middle layer; and 3) opaque, redwood core. Boeren-Wetering (1).

Diameter: 14.5 mm. Length: 13.3 mm.

IVp—Non-tubular, multi-layered “star” beads decorated with straight, simple stripes on the surface of the second layer.

IVp*. Round; medium size; decorated “star” bead with 5 “starry” layers: 1) transparent, clear or light gray (c; N 8/0) outer layer; 2) thin, opaque, white (a; N 10/0) layer decorated with 4 redwood (6 ne; 7.5R 4/6), 4 dark palm green (23 ni; 10GY 4/4) and 4 bright navy (13 pg; 7.5PB 3/4), straight stripes; 3) opaque, redwood layer; 4) opaque, white layer; and 5) transparent, bright blue (16 lc; 5B 5/7) core. Boeren-Wetering (1).

Diameter: 6 mm. Length: 8 mm.

IVp*. Flat; very large size; decorated “star” bead with 3 “starry” layers: 1) transparent, clear or light gray (c; N 8/0) outer layer; 2) opaque, white (a; N 10/0) middle layer decorated with 6 redwood (6 ne; 7.5R 4/6) and 6 dark palm green (23 ni; 10GY 4/4), straight stripes; and 3) opaque, redwood core. This type consists of a round bead pressed flat while the glass was still viscid. Boeren-Wetering (1).

Diameter: 5 mm. by 13.5 mm.

Length: 13.3 mm.

IVq—Non-tubular, multi-layered “pseudo-star” beads (all layers except the core are “starry”) decorated with straight, simple stripes on the surface of the second layer.

IVq*. Round; very large size; decorated “pseudo-star” bead with 4 layers: 1) thick, transparent, clear or light gray (c; N 8/0) outer layer; 2) opaque, white (a; N 10/0) layer decorated with 6 redwood (6 ne; 7.5R 4/6) and 6 bright navy (13 pg; 7.5PB 3/4) straight stripes; 3) opaque, redwood layer; and 4) transparent, cinnamon (3 le; 10YR 6/5) core. Boeren-Wetering (1).

Diameter: 18 mm. Length: 14 mm.

WOUND BEADS

Beads in this group were produced by repeatedly winding a filament of glass around a rotating mandrel until the desired size and shape were achieved. Before the glass hardened, the beads were sometimes pressed with small paddles to form facets.

Wib4. Round; large and very large size; transparent, pale blue (15 ca; 10B 9/3). The glass has a golden (opaline) cast when held up to a light. The perforation of one specimen is slightly tapered. Boeren-Wetering (2); 's-Graveland (1).

Diameter: 9–12.5 mm.

Length: 7–12 mm.

Wib11. Round; large size; opaque, robin's egg blue (16 ic; 5B 6/6). 's-Graveland (1).

Diameter: 9 mm. Length: 6.7 mm.

Wib14. Round; large size; opaque, bright dutch blue (13 la; 7.5PB 5/11). 's-Graveland (1).

Diameter: 9.2 mm. Length: 6.5 mm.

Wib15. Round; large and very large size; transpar-

ent, ultramarine (13 pa; 7.5PB 4/14). Boeren-Wetering (4); 's-Graveland (1); Rijnsburg (1).

Diameter: 8–10.5 mm.

Length: 8.5–10 mm.

Wlb16. Round; very large size; transparent, bright navy (13 pg; 7.5PB 3/4). Broek in Waterland (1).

Diameter: 13.5 mm. Length: 15 mm.

*Wlb**. Round; very large size; opaque, black (p; N 1/0). 's-Graveland (1); Broek in Waterland (4).

Diameter: 11–21 mm.

Length: 8.5–21 mm.

*Wlb**. Round; large size; opaque, redwood (6 lc; 7.5R 5/6). Boeren-Wetering (1); 's-Graveland (1).

Diameter: 8.5–9 mm. Length: 5.8–7 mm.

*Wlb**. Round; large size; opaque, barn red (6 pg; 7.5R 3/6). 's-Graveland (1).

Diameter: 10 mm. Length: 10.5 mm.

*Wlb**. Round; large and very large size; translucent, ultramarine (13 pa; 7.5PB 4/14). Broek in Waterland (4); Schinkelhaven (2).

Diameter: 8.5–21 mm. Length: 10–20 mm.

*Wlb**. Round; very large size; opaque, ultramarine (13 pa; 7.5PB 4/14). 's-Graveland (1).

Diameter: 16 mm. Length: 15 mm.

*Wlb**. Round; medium size; opaque, bright navy (13 pg; 7.5PB 3/4). 's-Graveland (1).

Diameter: 6 mm. Length: 6.2 mm.

*Wlb**. Round; large size; transparent, bright blue (16 lc; 5B 5/7). The perforation tapers slightly. 's-Graveland (1).

Diameter: 8.1 mm. Length: 8.5 mm.

Wlc—Oval wound beads.

Wlc3. Oval; very large size; translucent, pale blue (15 ca; 10B 9/3). The glass has a yellowish cast when held up to a light. Boeren-Wetering (1); 's-Graveland (1); Broek in Waterland (3); Schinkelhaven (1); Groenendaal (1).

Diameter: 13–20 mm. Length: 21–28 mm.

Wlc5. Oval; very large size; transparent, amber (3 lc; 7.5YR 7/8). Broek in Waterland (2); Schinkelhaven (1).

Diameter: 20–22 mm.

Length: 27–30 mm.

*Wlc**. Oval; very large size; opaque, black (p; N 1/0). Broek in Waterland (4); Schinkelhaven (1).

Diameter: 16.5–19 mm.

Length: 26–29 mm.

*Wlc**. Oval; very large size; translucent, ultramarine (13 pa; 7.5PB 4/14). Boeren-Wetering (2); 's-Graveland (1); Broek in Waterland (2); Schinkelhaven (3).

Diameter: 12–19 mm.

Length: 15–27 mm.

*Wlc**. Oval; very large size; transparent, copen

blue (13½ ic; 5PB 5/7). The glass has a golden (opaline) cast when held up to a light. Boeren-Wetering (2).

Diameter: 11–11.5 mm.

Length: 15–16 mm.

Wld—Donut-shaped wound beads. These are extremely oblate specimens with large perforations.

*Wld**. Donut-shaped; very large size; transparent, pale blue (15 ca; 10B 9/3). The glass has a golden (opaline) cast when held up to a light. 's-Graveland (1).

Diameter: 11 mm. Length: 5.5 mm.

*Wld**. Donut-shaped; very large size; transparent, pale blue (15 ca; 10B 9/3). The glass does not have a golden cast. 's-Graveland (1).

Diameter: 11 mm. Length: 6.5 mm.

*Wld**. Donut-shaped; very large size; translucent, copper (5 lc; 2.5YR 5/10). 's-Graveland (2).

Diameter: 11–12.5 mm.

Length: 6–7 mm.

Wllc—Faceted "Five Sided" beads. These are the equivalent of Horace Beck's (1928: 17) "twisted square" beads; each bead has eight, pentagonal, pressed facets applied while the glass was still viscid.

Wllc2. Faceted "five sided" bead; very large size; transparent, light gray (c; N 8/0). 's-Graveland (2).

Diameter: 10.5–18 mm.

Length: 10–19.5 mm.

Wllc3. Faceted "five sided" bead; large size; transparent, pale blue (15 ca; 10B 9/3). The glass has a golden (opaline) cast when held up to a light. 's-Graveland (1).

Diameter: 10 mm. Length: 7 mm.

Wllc5. Faceted "five sided" bead; large and very large size; transparent, amber (3 lc; 7.5YR 7/8). Boeren-Wetering (1); 's-Graveland (4); Broek in Waterland (2).

Diameter: 9.5–22 mm.

Length: 7–22 mm.

Wllc11. Faceted "five sided" bead; large and very large size; transparent, ultramarine (13 pa; 7.5PB 4/14). Boeren-Wetering (1); Schinkelhaven (2).

Diameter: 10–18 mm.

Length: 9–15 mm.

Wllc12. Faceted "five sided" bead; very large size; transparent, bright navy (13 pg; 7.5PB 3/4). Broek in Waterland (3).

Diameter: 15–17 mm.

Length: 13–16.5 mm.

*Wllc**. Faceted "five sided" bead; very large size; transparent, copen blue (13½ ic; 5PB 5/7). The glass

has a slight golden (opaline) cast when held up to a light. Boeren-Wetering (1).

Diameter: 18 mm. Length: 17 mm.

Willf—"Ridged Tube" beads; wound, tubular beads with rectangular, pressed facets that run the entire length of the bead.

Willf*. Ridged tube (pentagonal cross-section); large size; transparent, amber (3 lc; 7.5YR 7/8). Boeren-Wetering (1).

Diameter: 8 mm.

Length: 9 mm. (fragmentary)

Willf*. Ridged tube (pentagonal cross-section); very large size; transparent, ultramarine (13 pa; 7.5PB 4/14). Boeren-Wetering (3); 's-Graveland (2); Groenendaal (1); Velserend (11).

Diameter: 11.5–16 mm.

Length: 14–26 mm.

Willf*. Ridged tube (hexagonal cross-section); very large size; transparent, ultramarine (13 pa; 7.5PB 4/14). Boeren-Wetering (1).

Diameter: 10.5 mm. Length: 9 mm.

Willf*. Ridged tube (pentagonal cross-section); large and very large size; transparent, pale blue (15 ca; 10B 9/3). The glass has a golden (opaline) cast when held up to a light. Boeren-Wetering (1); Broek in Waterland (9); Schinkelhaven (3).

Diameter: 10–18 mm. Length: 13–29 mm.

Willb—Round wound beads having monochrome bodies overlaid in a design.

Willb*. Round; very large size; opaque, black (p; N 1/0) body decorated with 4 white (a; N 10/0) rings which encircle the bead perpendicular to the axis. The perforation tapers. 's-Graveland (2).

Diameter: 12.5–14 mm.

Length: 10–11 mm.

Willb*. Round; very large size; opaque, black (p; N 1/0) body decorated with 6–7 straight, white (a; N 10/0) stripes. 's-Graveland (2).

Diameter: 12–13 mm.

Length: 10–11 mm.

Willb*. Round; very large size; opaque, black (p; N 1/0) body decorated with 7–8 straight, light gold (2 ic; 2.5Y 7/7) stripes. 's-Graveland (3).

Diameter: 12.5–13.1 mm.

Length: 9.3–11.8 mm.

Willb*. Round; very large size; opaque, black (p; N 1/0) body decorated with a white (a; N 10/0) latticework encircling the equator. The latticework consists of two roughly parallel stripes with a third, wavy stripe meandering from one to the other forming irregular trianguloid to trapezoidal areas. The perforation tapers slightly on some specimens. 's-Graveland (3).

Diameter: 10–12 mm. Length: 9–11 mm.

Willb*. Round, very large size; opaque, black (p; N 1/0) body decorated with a light gold (2 ic; 2.5Y 7/7) latticework that encircles the equator. Boeren-Wetering (1); 's-Graveland (5).

Diameter: 10–14 mm.

Length: 10–11.5 mm.

Willb*. Round; very large size; opaque, black (p; N 1/0) body decorated with a copen blue (13½ ic; 5PB 5/7) latticework which encircles the equator. The perforation tapers slightly. 's-Graveland (1).

Diameter: 11.5 mm. Length: 10 mm.

NON-GLASS BEADS

Jet Beads

Round; very large size; opaque, black (p; N 1/0) jet bead. The material is very soft and light. The surface is shiny. Boeren-Wetering (1).

Diameter: 16 mm. Length: 15 mm.

Round-faceted; very large size; opaque, black (p; N 1/0) jet bead. This type is represented by a fragment which indicates that the bead had 9 pentagonal facets encircling each end and 9 diamond-shaped facets encircling the equator. The ends are flat and 6 mm. in diameter. Boeren-Wetering (1).

Diameter: ca. 18 mm. Length: indeterminate

Quartz Bead

Round; very large size; translucent, light gray (c; N 8/0) quartz bead. The bead is perfectly globular and has a smooth surface except for several gouged areas. Boeren-Wetering (1).

Diameter: 17 mm. Length: 17 mm.

Ceramic Bead

Round; very large size; decorated, opaque, brown mahogany (6 pi; 10R 2/6) earthenware bead. The surface is slightly granular but shiny. Decoration consists of 4 sets of identical punctuate designs: a small square with a small oval ca. 2 mm. from each side of the square. Boeren-Wetering (1).

Diameter: 12 mm. Length: 11 mm.

ACKNOWLEDGEMENTS

Sincere thanks are extended to the Institute for South Asian Archaeology of the University of Amsterdam for kindly permitting the study of the W. G. N. van der Sleen collection of beads which was donated to the Institute by Dr. van der Sleen's widow. Dr. J. M. M. Ubachs of the Institute deserves special thanks for making available van der Sleen's

unpublished notes and other relevant literature, as well as for providing general assistance.

Gratitude is expressed to Professor Milda G. Karklins for producing a translation of Ferrand W. Hudig's (1923) lengthy treatise on the Dutch glass industry.

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