

items difficult to find in libraries or research laboratories, but the *Manual* has been out of print since about 1972 while the high cost of the *Munsell Book of Color* (\$640.00 U.S.) precludes its purchase by all but the most dedicated researchers. Individual Munsell color chips are available but at \$1.70 each, the 91 recorded colors listed in Table 1 would still cost a hefty \$155.00.

Seeking a less expensive alternative, I examined the Centroid Color Charts prepared by the Inter-Society Color Council–National Bureau of Standards (ISCC–NBS) and selling for \$38.00 U.S. The 18 charts, each with from 10 to 29, glossy, one-inch-square color chips, exhibit 62 of the 91 recorded bead colors. Thirty of these are exact or near-exact matches, 21 are very close to matching (marked with an asterisk in Table 1), and 11 qualify as marginal matches (a double asterisk in Table 1). The exact Munsell values for each of these Centroid colors is provided in Table 1 so that the reader can see exactly how close the match is for each color.

In that over half of the recorded bead colors are represented in the ISCC–NBS charts, I consider them a useful alternative to the *Color Harmony Manual* and *Munsell Book of Color*, but only if supplemented by Munsell chips for the 29 unmatched colors. At \$38 for the charts and around \$50 for the required Munsell chips, you can accurately determine the color of practically every bead that you will ever encounter for less than \$90.

The set of ISCC–NBS Centroid Color Charts (SRM 2106) may be purchased for \$38.00 from the Office of Standard Reference Materials, Room B311, Chemistry Building, National Bureau of Standards, Gaithersburg, MD 20899.

[Editor's note: The price of the *Munsell Book of Color, Glossy Edition* has increased to \$945.00 and it is uncertain whether individual color chips are still available.]

References Cited

Container Corporation of America

1958 *Color Harmony Manual*, 4th ed. Chicago.

Karklins, Karlis

1985 Guide to the Description and Classification of Glass Beads. In *Glass Beads*, pp. 85–118. Studies in Archaeology, Architecture and History, Ottawa.

Kidd, Kenneth E. and Martha A. Kidd

1970 A Classification System for Glass Beads for the Use of Field Archaeologists. *Canadian Historic Sites: Occasional Papers in Archaeology and History* 1: 45–89. Reprinted in

"Proceedings of the 1982 Glass Trade Bead Conference," edited by Charles F. Hayes III, *Rochester Museum and Science Center, Research Records* 16: 219–257.

Munsell Color

1976 *Munsell Book of Color, Glossy Finish Collection*. Macbeth Division, Killmorgen Corporation, Baltimore.

42. ARCHAEOLOGICAL EVIDENCE FOR BEADMaking IN RIGA, LATVIA, DURING THE 13TH-14TH CENTURIES, by Karlis Karklins (1991, 18:11-13)

Archaeological excavations conducted in the 1970s at a site on Trokšņu (Noise) Street in the old section of Riga, the capital of Latvia, uncovered evidence of glass beadmaking there during the late 13th and 14th centuries (Caune 1983:102–103). Recovered from an area approximately 50 m² at the foot of a defense wall, the evidence included: 1,520 small round beads of opaque glass (most of these were deformed and represent manufacturing waste; Fig. 1); 9 intact crucibles; 149 ceramic crucible fragments with glass covering their surfaces; 474 sherds of vessels composed of coarse gravelly clay that had a thick layer of glass adhering to their interior faces; 293 variously sized chunks of glass; and ca. 150 brick fragments that exhibited traces of glass on their surfaces.

The archaeological deposit was composed of a dark, highly organic soil interspersed with charcoal, ash, or burned horizons. The recovered artifacts were concentrated in these lenses.

As none of the excavation units contained any structural remains of a glassworks, it appears that the works were located on the opposite side of Trokšņu Street. Wasters were thrown in an unoccupied area along the defense wall.

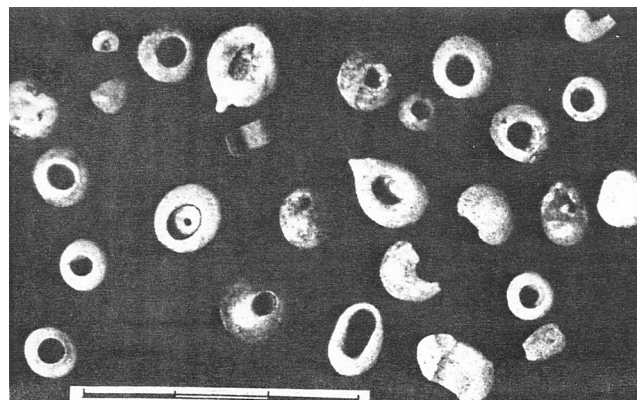


Figure 1. Reject glass beads from the Trokšņu Street glassworks in Riga, Latvia (Caune 1983:100, Fig. 16).

That the furnaces were rebuilt and renovated on a number of occasions is revealed by the presence, at various levels in the archaeological deposits, of many brick fragments with thick deposits of raw glass on their faces. It is believed that the bricks formed the base of the melting furnaces and that during the glassmaking process, molten glass from the crucibles was spilled onto them. During rebuilding, these bricks were discarded as useless.

The glassmaking workshops on Trokšņu Street stood for a long time as evidenced by a concentration of the finds in a ca. 1.5-m-thick layer in the cultural deposit. The recovered artifacts and their stratigraphic contexts indicate that the glassworks were in operation during the late 13th and 14th centuries.

Chemical analysis revealed that the glass produced at the glassworks was primarily composed of lead oxide (PbO) - 59.2%-74.7%, silicon dioxide (SiO₂) - 14.4%-33.87%, and tin dioxide (SnO₂) - 1.04%-8.28%. Because of the high lead content, the majority of the glass objects were yellow in color. Glass of greenish tones was occasionally produced by the addition of up to 1.4% of cuprous oxide (CuO). The glass produced in Riga was, thus, made from an easily melted composition of quartz sand and lead without an alkali additive. Its composition distinguishes it from the typical potash-lime glass of Western Europe. Non-alkali lead glass of similar composition had a broad distribution in Poland during the early Middle Ages, as well as in contemporary Old Russia.

References Cited

Caune, A.

1983 Arheoloģiskie pētījumi Rīgā laikā no 1969. līdz 1980. gadam. Latvijas PSR Zinātņu Akadēmija. *Arheologija un Etnogrāfija* 14:86-121. Riga.

43. ISCC-NBS CENTROID COLOR CHART UPDATE, by Karlis Karklins (1992, 20:6)

Bead researchers looking for an accessible and inexpensive chart for accurately determining bead colors have been dealt a low blow by the U.S. National Bureau of Standards which has discontinued the ISCC-NBS Centroid Color Chart discussed in *Bead Forum* No. 14. Following up on a note from Jeff Mitchem, a phone call to the NBS confirmed that this useful reference item has been discontinued. When asked if there was an alternative, they referred me to the Munsell Color Company. Readers knowing of another suitable color chart are asked to contact the editor.

44. A VENETIAN LANDMARK CLOSES, by Karlis Karklins (1993, 22:20-21)

It is sad to note the closing of the famous Società Veneziana Conterie at Fondamenta Giustinian 1 on Murano in the lagoon of Venice. The concern was founded in 1898 when 17 competing bead producers merged for their mutual benefit. It was initially known as the Società Veneziana per la industria delle Conterie. It later became the Società Veneziana Conterie e Cristallerie and then simply the Società Veneziana Conterie.

The company principally made drawn embroidery beads (*conterie*) in a rainbow of colors. It is truly mind boggling to contemplate how many thousands of tons of beads were sent abroad in the ninety-odd years that the Società was in operation. In the last few years the company experienced serious financial difficulties. A major problem was competition from countries such as Japan which could sell beads for what it cost the Società to produce them (Dr. C. Chiappetta, president 1987: pers. comm.). To expand its market, the company began to produce small glass pellets for use in atomic reactors.

The demise of the Società Veneziana Conterie marks the end of *conterie* manufacture on Murano. Bead production there is now limited to wound beads in various plain, mosaic, and millefiori forms, as well as chevron beads made from canes supplied by Vetrerie Moretti which is located a short distance from the Società complex.

It is not known what will become of the Società machinery or stock of canes and beads. It would be wonderful if someone could photograph the machinery and get detailed descriptions of it before it disappears. This is something I could not accomplish despite two visits to the factory in the 1980s. In some cases it was because the machinery was in operation; in others I was asked not to photograph certain operations because they were still considered trade secrets. It would also be beneficial if examples of the various sample cards and books that still exist in the Società's warehouses could be salvaged for distribution to researchers and research facilities around the world.

45. PHOTOGRAPHING PATINATED GLASS BEADS, by Karlis Karklins (1994, 25:13)

Good color photographs are an essential complement to written descriptions of beads. An excellent article by Robert K. Liu on how to photograph beads and objects formed of beads appears in the summer 1994 issue of *Ornament* magazine. Short but packed with useful information, this article will greatly help researchers to improve their