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INTERNATIONAL TRADE RELATIONS OF THE MIDDLE VOLGA REGION IN THE MEDIEVAL PERIOD THROUGH THE GLASS EVIDENCE

Abstract: Highlighting the unquestionable priority of the Volga trade route in contacts between the eastern parts of Europe and the East from antiquity and in the Middle Ages in particular is a comprehensive source analysis, centering on the most informative of these, that is, coins, glass artifacts and glazed ceramics. The Author presents the significance and perspectives of source-oriented research on medieval glassware from the middle Volga region. The specific character of the region, its key importance in many ethno-cultural, political and historical processes, together with its massive source base of glass artifacts (which includes adornments, glass tableware, window glass) opens a broad perspective for historical reconstructions. Not only can the direction and dynamics of international relations be defined, but it is also possible to establish levels of craft and urban culture development, as well as more specific site chronologies, all of which help in stratifying the towns of Volga Bulgaria by their social status within the state.

Keywords: middle Volga, medieval glass, intercultural interaction, Volga Bulgaria, ancient Rus', Golden Horde.

INTRODUCTION

The middle Volga region was an important player in the transcontinental trading system of the Volga–Baltic area in the late 1st–early 2nd millennium A.D. Glass artifacts, occurring on a mass scale in the archaeological records, are of particular significance for research aimed at determining the nature of trade and goods exchange, the trends in operation and their dynamics. Glassware: beads and other objects are a useful tool for solving issues centering on chronology. However, the informative opportunities of archaeological glass grow immeasurably once the specific craft centres are identified for particular objects and this process is dependent on comprehensive studies of morphology, chemical composition and technology. In a number of cases, an in-depth technological approach has not only determined the type of workshop, but has also enabled conclusions concerning the organization of production.

The earliest glass vessels from the middle Volga and Kama regions come from funerary complexes of the 5th–7th centuries. First is a lamp made of colorless glass with blue drops from the Turayevov burial mound of the beginning of the 5th c.

(Valiulina 2009, pp. 134–136, Table 1, Fig. 1). The material is sodium glass of type III according to Julian Henderson, representing a late Roman recipe, similar in composition to the late Roman and early Byzantine glasses of Hermopolis, Fustat, Caesarea, Bet-Eli'ezzer, Apollonia and other centres of the southeastern Mediterranean (Henderson *et al.* 2004, p. 454; Freestone *et al.* 2003, pp. 22–23). The technology and chemical composition of the glass of the vessel is closest to the production of the workshop located in Jalame (Brill 1988, pp. 262–263, Table 9:3,4). The Turayevo lamp is currently the most northeastern discovery of products of this kind, which were common in late Roman and early Byzantine times. The second early medieval vessel from the Volga region is a massive cup from the Kominternovo II burial mound of the 2nd half of the 6th–beginning of the 7th centuries. This Iranian-produced cup (H 9.7 cm; D 9.4 cm), made of blue glass with a matt finish and carved with a composition of four cross-in-circle motifs, attests to links with the Nestorians of Sasanian Iran. Similar Iranian products but with different carved decoration are dated to the same period; they come from a burial mound in Birsk burial in the southern Ural, from Tsebelda burial (Valiulina 2015b, p. 237, Fig. 1:1–4) and from the collection of the Museum of Leiden (*Recent...* 1966, p. 131, no. 16). Prototypes for the whole group were the earlier Roman, Syrian and Egyptian vessels of the 4th–5th centuries, now in the Museum of Fine Arts in Boston (Saldern 1968, no. 46). Judging by the topography of the finds, Iranian glass vessels, as well as Iranian silverware of the 6th–7th centuries and some Kufic coins entered eastern Europe through the Caucasus (Darkevich 1976, p. 146).

It is deeply symbolic that the earliest vessels found in the Volga–Kama region represent the two different glassmaking traditions: post-Roman and Sasanian, that stood at the base of what has come to be called Islamic glassware in the Near East.

EARLY BULGARIAN PERIOD

In the following period, during the Umayyad–Khazar wars, trade between the Islamic world and eastern Europe was impossible (Noonan 2004, p. 258). Glass finds confirm the validity of this conclusion: glass beads are rare north of the Caucasus and other products are not found at all. More importantly, however, glassmaking in the Islamic world of the 7th to 9th centuries continued within a mainly post-Roman tradition, producing everyday utilitarian products that were not subject to export at the time. Not accidentally, Stefano Carboni, following Carl Johan Lamm, called this period before the 9th c. an age of transition in Islamic glassmaking and the glass itself pre-Islamic (Carboni 2001a, p. 4). During the 9th–11th centuries, the Middle East developed its own unique glassmaking style, featuring a wide range of ceremonial and everyday products, richly decorated with foil details, a combination of different colors, relief, carvings, including two-layered glass, engraving, grinding, gilding and luster-paint. The new artistic phenomenon was accompanied by technological change as well, that is, a transition from soda glass to plant-ash glass (Brill 2001, p. 42; Henderson *et al.* 2004, p. 461).

The road to the North Caucasus through the Daryal Gorge in the 9th–11th centuries is documented by finds of Syro-Egyptian glass in Dvin, Ani, Dmanisi and Alan burials (Busyatskaya 1972, pp. 83–84, 87; Darkevich 1976, p. 146, Table 53:II).

The early Bulgarian period in the history of the Middle Volga region (8th–10th centuries) is extremely rich in glass beads. Comparative chemical-technological analyses of the beads from the Bol'she Tarkhany cemetery (2nd half of 8th–1st half of 9th centuries) and Bol'she Tigany cemetery (9th–early 10th centuries) burial grounds showed that there were many similarities between the two collections (Valiulina 1996, p. 141). Most of the beads (85% in Bol'she Tarkhany and 95% in Bol'she Tigany) were mass-produced serially from drawn glass tubes in specialized Middle Eastern workshops focused on international trade. Segmented beads with distinctive combinations of blue and yellow with multiple threads, as well as silver-glass beads represented such products (11.4% and 8%). A smaller group consists of beads made of single-colored and mosaic rods, produced in specialized workshops of Egypt and Mesopotamia; the latter is represented by the glass wall tiles from Samarra, made in the 'millefiori' technique like the beads (Whitehouse 2001c, pp. 147–148, no. 61).

Semi-quantitative spectral analysis showed that in the case of most of the beads the glass was melted with ashes of southern plants, which can be expressed in the $\text{Na}_2\text{O}-\text{K}_2\text{O}-\text{CaO}-\text{SiO}_2$ formula for the glass. Several opaque yellow beads strongly resemble 8th–9th centuries lead-glass (characterized by high lead content) beads from the northern Caucasus in the chemical composition of the glass (Deopik 1961, p. 232) and from western Europe (Dekówna 1980, pp. 286–287, Tables 80–86). Faience ribbed beads are present in later burials in the Bol'she Tigany cemetery ground and beads with blue and brown enamel have been recorded from the Tankeevka cemetery. In general, both sets of beads are close to the Saltovo–Mayaki culture, although less diverse in terms of form and décor. This difference is probably due to the secondary importance of the Middle Volga market as compared to Saltovo and the markets of the Khazar Khaganate through which most of the Eastern beads brought to the Middle Volga region passed in the 7th–9th centuries.

There are also differences between the two collections. The burials at Bol'she Tarkhany cemetery, which belongs to the Bolgar–Saltovo group of archaeological sites, contained 818 beads in 358 burials and not one was of stone. In the Bol'she Tigany group, which belonged to an Ugric (proto-Hungarian) population of the Ural–Kama region, of the 2507 beads found in 31 of 51 undisturbed graves (nearly 155 burials were explored) a hundred were of stone.

Given that a relatively small number of beads in an assemblage corresponds to real price and true position of beads in the value system, whereas an abundance of beads implies unequal exchange and a higher position of the beads in the value system, then it may be assumed that the population using the Bol'she Tarkhany burial ground represented a higher level of socio-economic development. However, it is necessary to keep in mind that these burials belonged to different ethno-cultural groups, which were chronologically disparate.

Tankeevka burials in the Kama region (mid 9th–1st half of 10th c.) contained 10 780 beads in 285 graves (out of a total of 1200 burials that were explored). Glass

beads were represented by segmented single-layered, two-layered with silver foil, mosaic, drawing cut into straight sections (Figs 1–2), and faence (stone paste) (Fig. 3:b). The number of stone beads increased significantly, with a preponderance of jet, glass beads (25%), cornelian and crystal (Figs 2–4). Representation of the glass beads collection also changed with the appearance of goods produced in winding technique.

Studying the trade of Volga Bulgaria with Samanid Central Asia in the 10th c. and evaluating it as ‘the zenith of Islamic commerce with Northern Europe’, Thomas S. Noonan used a broad range of sources starting with coins to identify four phases of eastern European trade with the Islamic world. First was the Khazar period dating to the end of the 8th and the 9th centuries, when routes passed through the Khazar Khaganate, and especially, the Lower Volga and the Caspian Sea, and then led to the Middle East. The percentage of dirhams minted in the Middle East and imported through the Khazar Khaganate by the Caspian–Caucasus routes reached almost 100% in this period. The Bulgarian–Samanid period that followed started around 900 and lasted until the end of the 10th c. While the old routes to the Middle Eastern markets continued to function, the greater part of this trade, according to Noonan, now passed by the caravan route between Central Asia and the Volga Bulgaria. Import of the Samanid Middle Eastern dirhams, which had reached 85% of the total imports from the Islamic world in the 940s, remained at such a high level throughout the 10th c. (Noonan 2004, pp. 259–293). It is interesting to correlate the monetary amount with the quantity of mass-produced Middle Eastern glass beads, which constituted another international currency of the time. The number of beads in eastern European assemblages rose steadily from the end of the 8th and all through the 9th c., reaching an absolute maximum in the 10th c. It seems that in the 10th c. Middle Eastern glass beads replaced Middle Eastern silver dirhams in the eastern European fur trade. In this context, the Caucasus route to the Middle East in the 10th c. is hardly secondary in appearance (Fig. 5).

In the 10th–11th centuries, the trade posts and handicraft factories of Semenovo I and Izmeri I settlements in the Middle Volga region acted as a kind of international fair in the middle section of the Volga–Baltic trade route (Kazakov 1991). Glass beads predominated in the material from these localities (Valiulina 2008). Almost 90% of the beads from the village of Semenovo I was made serially from drawn glass tubes. This group included the following types: ribbed (rosette-shaped in section), segmented Syrian beads made of small tubes and segmented beads. ‘Choped’ glass beads made of tube cut into straight sections, of opaque glass, 117 in number (8.4%), came in three different colors: yellow (98), blue (13), and green (6).

Only six examples of ribbed, mostly longitudinally ribbed large beads, were found. Two were barrel-shaped, from opaque and yellow glass (Fig. 6a); two from semi-transparent and blue glass (Fig. 6b) and two from colorless and transparent glass (Fig. 6c). The type is widespread geographically, but represents a narrow chronological range. At Staraya Ladoga, this type of large longitudinally-ribbed bead of transparent colorless and bright blue glass first appeared at the ‘D’ level of the buildings (L’vova 1968, pp. 88–89). A colorless ribbed bead, similar to those



Fig. 1. Necklaces of glass beads from the graves of Tankeevka burial of the 9th–10th centuries

a – SMTR 14830/1286 grave 635; b – SMTR 14830/963 grave 547; c – SMTR 14830/950 grave 544;

d – SMTR 14830/921 grave 532.

Photo S. Valiulina



Fig. 2. Necklaces of beads from Tankeevka burial of the 9th–10th centuries
– SMTR 14830/1507 grave 701.

Photo S. Valiulina



Fig. 3. Necklaces of beads from the graves of Tankeevka burial of the 9th–10th centuries: glass, stone
(jet, crystal, carnelian) and stonepaste

a – T-74/21 grave 26; b – T-61/372 grave 82; c – T 61/320 grave 72.

Photo S. Valiulina

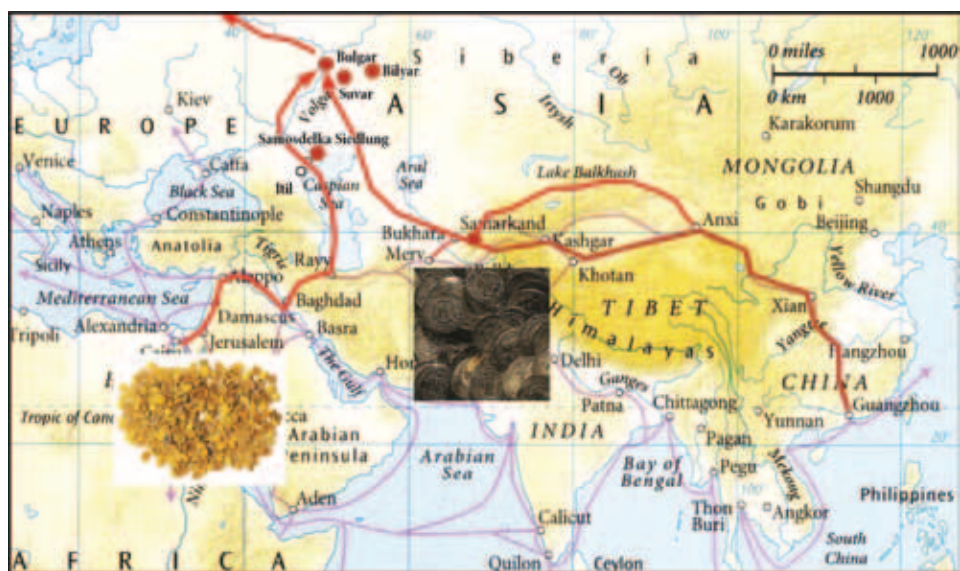


Fig. 4. Necklaces of beads from the graves of Tankeevka burial of the 9th–10th centuries: glass, stone (geshir – jet, crystal, carnelian)

a – SMTR 14830/284 grave 303; b – SMTR 14830/359 grave 347.

Photo S. Valiulina

in the Semenovno I settlements, was discovered in 2002 in the ‘Zemlyanoe’ stronghold of Staraya Ladoga, in a layer from the 10th c. (Kirpichnikov 2003). In Novgorod, similar beads were found in a layer from the 10th–11th centuries (Shchapova 1956, p. 176, Table II 8, 10). Johan Callmer dated the opaque yellow and transparent colorless ribbed beads from the Nordic and Baltic regions to the last third of the 10th c. (Callmer 1997, Pl. 18 B). The Tankeevka I graves yielded 17 large ribbed beads from colorless, blue, brown and yellow glass (Kazakov 1971, Pl. XXII, Figs 37–39). One bead originated from this Izmeri I settlement and 43 ribbed beads were found in Bolgar. Beads of this kind were represented on sites from the 2nd half of the 10th–early 11th centuries at Gnezdovo (Likhter, Shchapova 1991, Fig. 1a:6, 10), in 9th–10th centuries Krutik ‘settlement’ (Golubeva, Kochkurkina 1991, p. 115, Fig. 50:21, 22, 39) and far in the East, in the region of the Irtysh river in Kazakhstan and in burials of the 10th c. near Zevakino burial (Arslanova 1998, Fig. 1:9).



a



Oxide	Weight %	Oxide	Weight %	Oxide	Weight %
Na ₂ O	11.37	Na ₂ O	13.36	Na ₂ O	17.47
MgO	4.59	MgO	3.17	MgO	2.25
Al ₂ O ₃	1.21	Al ₂ O ₃	1.36	Al ₂ O ₃	4.12
SiO ₂	67.11	SiO ₂	64.04	SiO ₂	62.09
P ₂ O ₅	0.05	P ₂ O ₅	0.57	P ₂ O ₅	1.08
K ₂ O	2.17	K ₂ O	3.91	K ₂ O	4.77
CaO	6.06	CaO	11.80	CaO	3.8
TiO ₂	0.11	TiO ₂	0.13	TiO ₂	0.26
MnO	0.54	MnO	0.15	MnO	0.23
FeO	0.46	FeO	0.37	FeO	1.07
CoO	0.02	CoO	0	SO ₃	1.16
As ₂ O ₃	0.06	SO ₃	0.29	PbO	1.14
SrO	0.09	Total	99.15	Total	99.44
Sb ₂ O ₃	0.17				
SnO ₂	0.52				
PbO	4.45				
Total	98.98				

Fig. 5. The main route of international trade of the Middle Volga region in the 10th c.

a – map; b-d – samples of specific types of beads, inv. nos B2014-42 (a), CLXXIV 2013/917 (b), CLXXIX (c); chemical composition (SEM), Bolgar, 10th c.

Compiled by A. Frolov

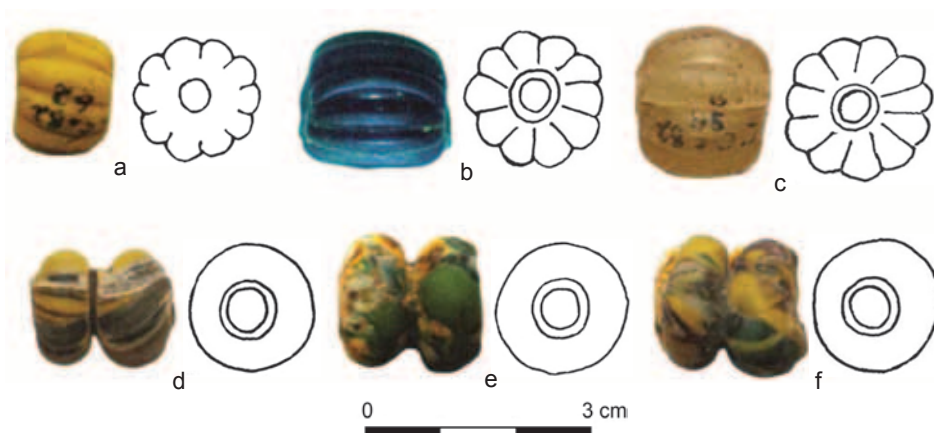


Fig. 6. Main types of glass beads from Semenovo 1 settlement of the 10th c, inv. no. collection: BSHAMR, SS/175.

Photo A. Frolov

A predominant type in the first group and in the entire collection were segmented Syrian yellow beads made of double-layered glass (colorless semi-transparent and yellow from the inside, also opaque and yellow from the outside) – 728 examples, making up more than 54% of all of the beads from the Tankeevka burial (Fig. 7b). Single-segment, Syrian striped beads numbered 55, or about 4%; this type was distinguished from the previous one by additional surface decoration, longitudinal red-brown stripes, sometimes with the addition of black or deep green ones (Fig. 7f). Multi-segmented or single segmented beads counted 206 (just over 15%), including 190 multi-segmented yellow beads. Only 8 of these beads, the larger ones, were made of double-layered glass. The segmented beads are mostly broken (Fig. 5a), hence it may be assumed that the two- and three-segmented beads made up most of the collection and that seven-segment examples were extremely rare. There were 7 blue multi-segmented beads in the collection and one ten-segment example; the glass of these beads is notable for its soft and faded color. Another 7 two-segmented blue beads were decorated with white longitudinal stripes (Kazakov 1991, p. 147, Fig. 47:44). Johan Callmer dated beads of this kind (E 064) to 960–980 (perhaps 950–960) and earlier (Callmer 1977, p. 89). Only 2 double silver-glass beads were found, together with one two-segmented ‘golden-glass’ segmented bead with silver foil and yellow transparent glass surface.

Beads with bulging ‘eyes’ inside loops or with zonal decoration (38 examples) and in one case cylindrical-shaped loops were quite common; they were large in diameter (10–17 mm), black in thin section; the glass of body of these beads was transparent, of deep manganese or green color. Loops were white, turquoise, red and yellow in color, the ‘eyes’ radiated or concentric, red–white–black, red–white–turquoise or single-colored, either yellow, turquoise or red (Fig. 8a, b, e–o). One zonal opaque red bead with green-grey loops did not have ‘eyes’ (Fig. 8d). Among the Volga-Bulgarian sites, the largest number of these beads, 57, was noted in Bolgar,

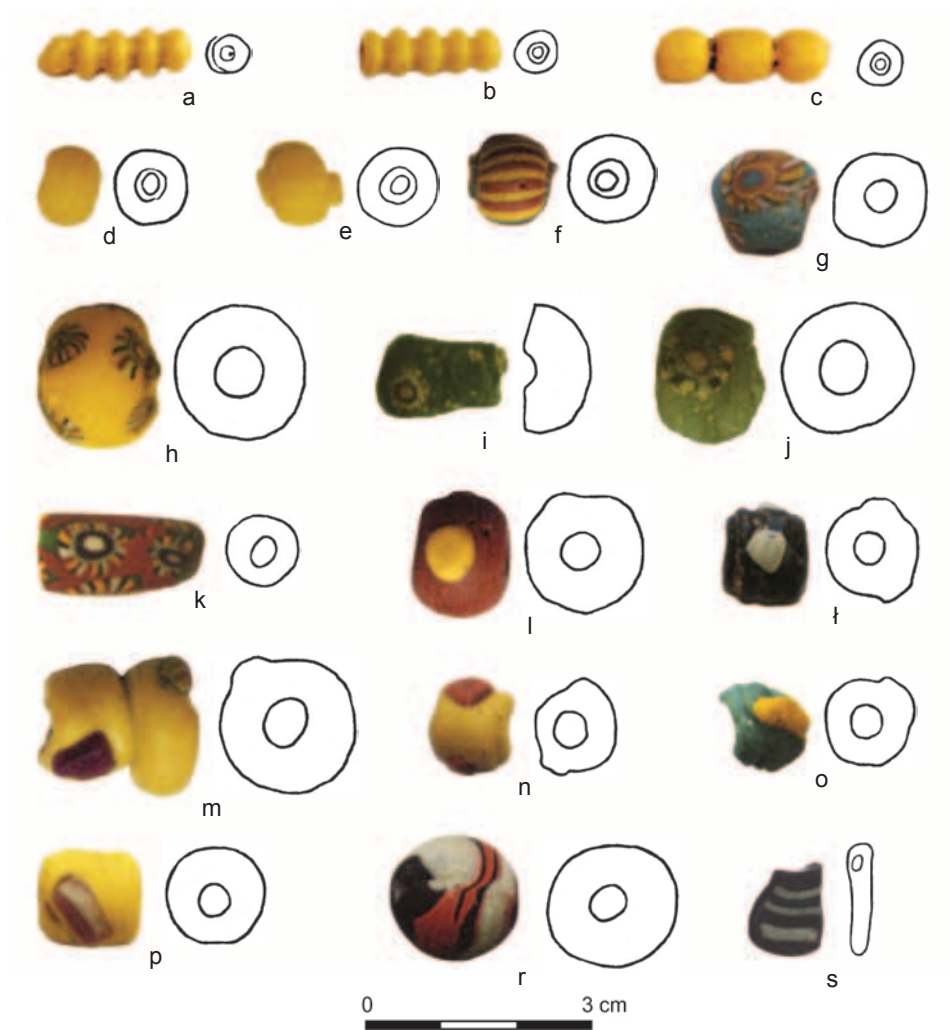


Fig. 7. Main types of glass beads from Semenovno 1 settlement of the 10th c.,
inv. no. collection: BSHAMR, SS/175.

Photo A. Frolov

three came from Izmeri I, and one each from graves at the Bol'she Tigany burial ground and from the settlement of Laishevo and Muromskij stronghold in the Samara region (Valiulina 2008, p. 289). In eastern-European assemblages, beads like these are dated to the 10th and beginning of the 11th c. (Shchapova 1956, p. 178; Lvova 1968, p. 77; Golubeva, Kochkurkina 1991, pp. 115–116; Goldina, Koroleva 1983, p. 64). More than 2660 glass beads of mass production were found in the 10th–11th centuries layers of the site of 'Zemlyanoe' stronghold at Staraya Ladoga in 2002 (Kirpichnikov 2003, p. 80). Only 5 of these were black beads with 'eyes' in loops (one was intact and others were fragmentary). Beads of this kind are

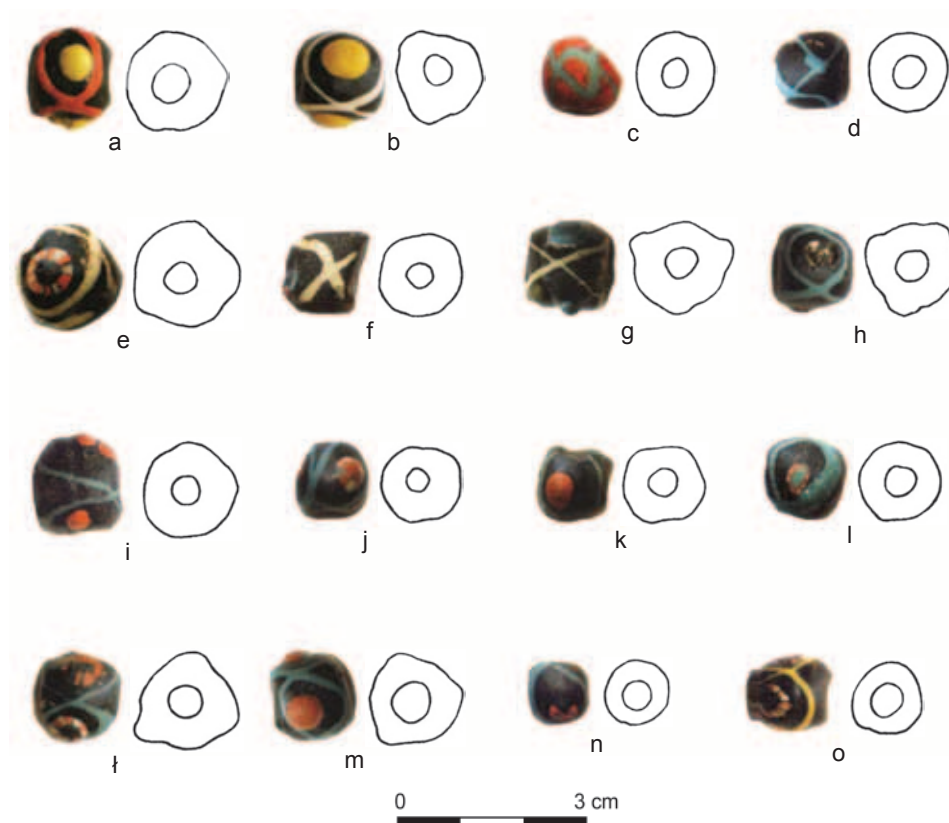


Fig. 8. Main types of glass beads from Semenovno 1 settlement of the 10th c.,
inv. no. collection: BSHAMR, SS /175.

Photo A. Frolov

known from Poland (Dekówna 1980, p. 109; *eadem* 2007, p. 84, Fig. 17), Afrasiab in the Northern Caucasus (Poluboyarinova 1988, p. 158), and the 10th c. burials in the Irtysh river region of Kazakhstan (Arslanova 1998, p. 107, Fig. 1:34).

A study of the bead distribution in 492 burials at Halimba Cseres and 34 at Kenézló-Fazekaszug led K. Szilágyi to conclude on the use of these beads as apotropaic elements beside the traditional function of personal adornments for hair and clothes (Silagi 1992, pp. 107–109). Johan Callmer included both ‘eye’ beads in loops (type B 090) and mosaic ones from Scandinavian contexts in one chronological group from 960 to 1000 (Callmer 1977, pp. 85–86, col. Pl. I) or from the middle to the last third of the 10th c. (Callmer 1997, Pl. 18 A 7–9, B 12). According to researchers, these beads were Middle Eastern imports (Callmer 1997). Judging by finds of grave goods, there were from one to four beads of this kind in necklaces (Hanuliak 1993, Fig. 15:17; Kivikoski 1973, col. Pl. e II 5); in Moravia, the percentage of these beads was higher in child burials compared to adult ones (Hanuliak, Rejholcova 1999, p. 63).

Beads of this kind were made of sodium ash glass (Dekówna 1980, p. 109, Table 20: no. 1056; Mugurevich 1965, p. 76, annexe II, nos 267:14, 268:22; Szilágyi *et al.* 1995, p. 86, Table I). A rather high content of aluminum and magnesium compounds in their composition made them chemically stable, preserving the brightness of colors and a glittering surface without patina. Manganese (lilac or manganese color in thin section) or iron (deep olive color) were used as a colorant for the matrix glass, while the color of the decoration depended primarily on compounds of copper, tin, lead, manganese and iron.

Large zonal beads were a related type, different in size and decoration: 2 beads up to 3 cm long, made of black glass, white threads on the surface forming large diamonds instead of ovals, slightly protruding red–yellow–green radiated ‘eyes’, in one case placed in diamonds (Kazakov 1991, Fig. 47:75), in another in diamonds and in the triangles around both ends of the channel. A similar bead was found in the Rurik stronghold, where it was assigned to the earlier group of products of the late 1st millennium A.D. (Nosov *et al.* 2005, p. 62, Table VIII 58). Another similar bead of dark blue color with concentric white–blue ‘eyes’, originated from grave 967 in the Birka cemetery (Callmer 1977, p. 31, Pl. 11, col. Pl. II 450). A bead from the Israeli Museum has bulging yellow spots where the threads intersected in addition to its concentric blue–yellow–red, slightly bulging ‘eyes’ in diamonds and triangles (Spaer 1993, Pl. 9:132), like the bead from Bolgar and pendant bead from Beloozero (Golubeva 1973, Fig. 65:20).

Eye-beads from Semenovo I village include medium, short, slightly cylindrical beads of opaque glass, decorated with pieces of glass, the color of which is different from the color of the glass matrix; the ‘eyes’ are slightly melted (Fig. 7m-s). The following beads are distinguished by the color combinations: green body with yellow or white ‘eyes’, 21 examples (Fig. 7o); yellow beads with turquoise, opaque liver-red, or semi-transparent manganese ‘eyes’, 17 examples (Fig. 7m), or with double-layered manganese-white ‘eyes’, 3 examples.

These beads are unknown at other Volga-Bulgarian sites. They resemble more the neatly decorated beads with radiated bulging ‘eyes’ from Novgorod of the mid-10th c. and from other ancient Russian sites of the 10th–early 11th centuries (Shchapova 1956, p. 178; L’vova 1968, p. 78; *Put’ iz varjag v greki i iz grek* 1996, p. 44, no. 75). They are especially close to beads from burials in Finland discovered at Kuuzela, Luistari and Kyulo (grave 39), dated to the last quarter of the 10th–1st quarter of the 11th c. (Kivikoski 1973, Pl. 92, Fig. 822:1/1; Cleve 1978, Pl. 1:12; Lehtosalo-Hilander 2000, pp. 240, 245, Pls 8; 13). Several deformed cylindrical, yellow beads, decorated with pieces of glass, were two-segmented (Fig. 7m). These beads are present in the material from the Luistari burial (Lehtosalo-Hilander 2000, p. 245, Pl. 13).

Traditional ‘eye’-beads are represented by middle-sized cylindrical opaque turquoise examples with smooth red–white–yellow colored ‘eyes’, 2 examples (Fig. 7g), and zonal beads of liver-red color with yellow eyes, 8 examples (Fig. 7l); one white bead with black–white ‘eyes’ radiated with red and yellow rays; middle-sized liver-red beads with smooth black–white ‘eyes’, 2 examples; large, yellow beads with

smooth red–white ‘eyes’, 3 examples (Fig. 7h); green beads with bulging red–white–black and yellow–white–black radiated ‘eyes’, 3 examples (Fig. 7i, j).

The group of mosaic beads consists of prismatic octagonal beads of 15 × 13 mm with pyramidal ends, made of one or several polychrome rods. Black and white glass rods were placed in the mould, covered with glass powder for the body glass matrix and sintered in a furnace. Still hot beads were given their final form by pressing on a flat surface. These beads have a frosted surface and grain structure of the matrix glass, which attests to their production from not fully melted baked powder (Alekseeva 1971, pp. 181–182; L’vova 1980, p. 77). Six beads of this kind were found in the Semenov I settlement, one sample was found at Izmeri I settlement (Fig. 9s). The beads find parallels in the Gnezdovo burials of Yaroslavl and in Finland at Kyulo and Luistari (Kivikoski 1973, Fig. 822:1/1, Pl. 92; Cleve 1978, pp. 129–130, Pl. 12), dated to the 10th and early 11th centuries.

One large mosaic bead of cylindrical shape originated from Semenov I settlement (Fig. 7k). The bead was made by sintering polychrome rods, which created a pattern of ornamentation consisting of black–white–red–yellow ‘eyes’ with rays on a red–green background. Beads like this one, Callmer’s type B 696, are dated in Scandinavia to 960–1000 (Callmer 1977, col. Pl. III).

A large spherical bead of black glass has red–white concentric décor. These beads are present in Middle-Eastern museum collections (Spaer 1993, p. 184, Pl. 14). Decorated like ellipsoidal beads, they are also known from Bilyar and Muromskij stronghold (Valiulina 2005, Fig. 29:27). These beads are typical of the 11th c.

A special group among mosaic beads consists of large, lemon-shaped, double- or single-segmented beads (39 examples). These beads have a drawn structure, sometimes with slight spinning, striped or multi-colored with prevalent spots and crumbs; some with deformed ‘eyes’, predominantly of yellow–black, yellow–green or black–white color. They were made of unfinished products or waste, that is, shapeless pieces of different size, broken parts of cylindrical ‘eyes’ and mosaic beads. Beads were made by baking the original material around the tool, and the resulting multicolored tube was intercepted by use of forceps to form a two-parted bead, or was intercepted and split off to form a single bead.

These beads reveal a heterogeneous structure in section and numerous caverns (Fig. 6 d-f), indicating less than masterly skills of the craftsman, who may have been an apprentice to the bead craft. It is hard to find any parallels for these beads, except for some partly preserved examples from early Beloozero (Zakharov 2004, p. 153, Fig. 318:3–6) and from Luistari in Finland (Lehtosalo-Hilander 1982, col. Pls III 10; IV 9). The nearest resemblance is to flat-rounded beads from the 9th–10th centuries burial ground in Vydrikha in the region of the Irtysh river in Kazakhstan (Arslanova 1998, p. 102, Fig. 2:12, 17). Research by F.H. Arslanova has revealed a strong resemblance between the Vydrikha cemetery beads and those from Semenov I settlement: ‘Structural elements in the form of shapeless striped black and yellow pieces are longitudinally stretched and break at the ends of the canal. The canal extends in the middle. The beads from Staraya Ladoga are made in a similar manner, but

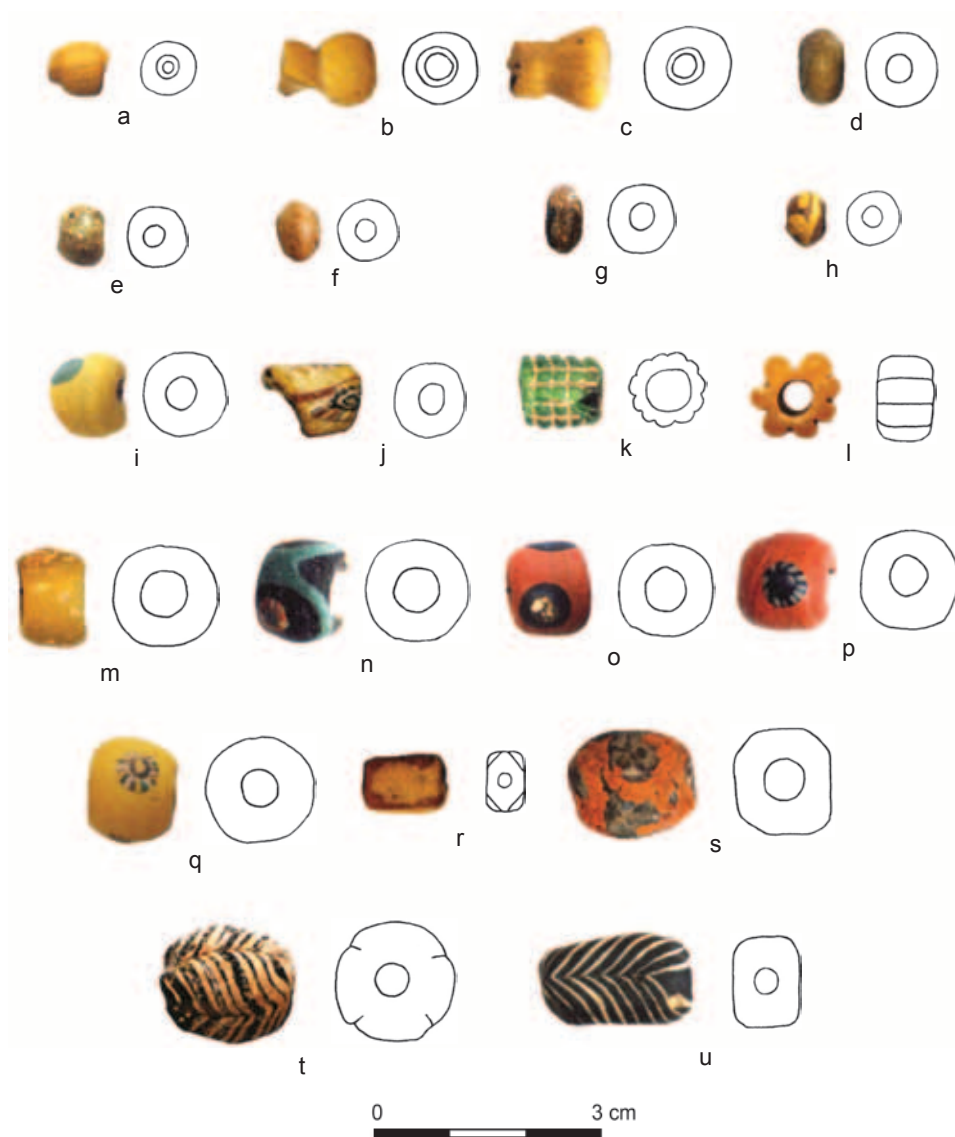


Fig. 9. Main types of glass beads from Izmeri 1 settlement of the 11th c., inv. no. collection: BSHAMR, IZ/178.

Photo A. Frolov

from other raw materials; they are found in layers of the second half of the 9th c. in Zemlyanoe stronghold' (Arslanova 1998, p. 107).

Several large double segmented yellow beads from the Semenov I settlement collection are like the mosaic beads in size and technique of production. Only two beads were made of layered glass; they are of medium size, flat and irregularly drop-shaped, black with crossing grey stripes, the hole pierced in the narrower part (Fig. 7s).

The chemical composition of the glass of the Semenovo I settlement beads falls into two classes: $\text{Na}_2\text{O}-\text{CaO}-\text{SiO}_2$ and $\text{Na}_2\text{O}-\text{PbO}-\text{SiO}_2$. In both classes the glass was melted with ash of halophyte plants used as the alkaline raw material. The characteristics of the glass correspond to the Middle Eastern glassmaking tradition. It is interesting to compare the content of manganese used as a colorant in a black bead with 'eyes' in loops from a burial of the early 10th c. The content of manganese is higher in the glass of bead of Bol'she Tigany (6.01%); at the same time the iron in the glass of this bead (4.36%) has the same function. Each of these colorants alone could well do the job of producing the desired 'black' color. A combination of manganese and iron helped to achieve black in the glass of beads with 'eyes' in loops from Polish sites of the 10th c. (Dekówna 1980, p. 109, Table 20, no. 1056) as well as Hungarian sites (Szilágyi *et al.* 1995, p. 86, Table I). This feature may be typical of early stages in the production of these beads; in any case, similar beads from the late 10th c. Semenovo I settlement and from Bolgar (Fig. 5d) were tinted black (olive in the break) more efficiently with iron compounds alone (1.04% and 1.77%). This fact can be chronological indicator of changed technology during the 10th c.

The range of parallels for individual types of beads is extremely wide, practically unlimited for the segmented Syrian tube beads and segmented multi-parted beads owing to transcontinental trade in 10th–11th centuries Eurasia.

The Semenovo beads are closest in range, glass composition and proportion of types to the early beads from Bolgar, ancient Beloozero (Zakharov 2004, pp. 67–68, Fig. 262), Staraya Ladoga horizon D (L'vova 1968), and also beads from necklaces found in graves of the last quarter of the 10th–early 11th centuries in Kyulo, Kuuzela and Luistari in Finland (Cleve 1978; Kivikoski 1973; Lehtosalo-Hilander 1982). The list includes localities and regions that were direct partners in the Volga–Baltic trade. Several different factors allow the Semenovo I settlement collection of glass beads to be dated to the last quarter of the 11th c.

The composition of the Semenovo I settlement assemblage has to be attributed not so much to a producer as to the merchant at one of the transit points of the multi-stage medieval trade. This leads us to consider the long route and the market distribution hierarchy. The range of the collection is fairly narrow; more so, it lacks types of beads like the gold-glass and silver-glass, and contains only a small quantity of glass beads. Any assessment of the range of imports has to take into account the likes and dislikes, preferences and traditions of the local population. The beads of Volga Bulgaria were first of all an instrument of trade. It is not a coincidence that in Volga Bulgaria sites, outside the trading-craft-settlements-fairs, there are no parallels for the Semenovo I settlement collection, either in numbers or composition, apart from Bolgar itself, which was another link in the international trade. The color range is also peculiar, with yellow dominating the beads. The large number of broken segmented Syrian tube beads and lemon-shaped multi-parted beads (they are cracked with the exception of just a few) are a peculiarity of this set. These may have been waste products brought deliberately from the Middle East workshops as a semi-finished product to be used in an emerging production centre or it could be breakage, sorted out from many consignments passing down the Volga river and

left at the Semenovo I settlement transit point of international trade, where some use could be found for it. Both explanations remain hypothetical for now.

The collection from the Izmeri I settlement differs from the Semenovo I settlement assemblage in number (395 examples). Most beads were made by winding technique (85.8%). Beads made from a drawn and winding tube and a drawn rod number 56 examples. This group includes primarily segmented Syrian tube beads (11 examples; Fig. 9a), multi-parted lemon-shaped yellow (24) and blue bead (2), large lemon-shaped two parted beads similar to those from Semenovo I settlement (10; Fig. 9b, c), one large and ribbed bead, similar to the Semenovo ribbed beads, cylindrical 'eye' beads (2), zonal beads with 'eyes' in loops (3; Fig. 9n). Three mosaic beads were found: 'millefiori', octagonal and prismatic with pyramidal ends (Fig. 9s), and large ellipsoidal (Fig. 9j). A middle-sized prismatic quadrangular bead with the corners flattened around the holes and made of opaque yellow-red glass were formed by pressing (Fig. 9r). Such beads were represented in abundance in a necklace from Luistari burial 56 (Lehtosalo-Hilander 1982, col. Pl. III 9). Most of this collection consisted of rounded glass beads, made by the winding technique and of different color: yellow (67); green (14), small and middle-sized zonal and ring-shaped (Fig. 9d, e, g), in two instances with inlay decoration (Fig. 9h): zonal 'eye' beads (27; Fig. 9o-q), bi-trapezoidal, middle-sized with a height-to-diameter ratio of 1:2, beads of semi-transparent glass, one yellow and 3 blue (Fig. 9f).

Two beads, ellipsoid and rounded-prismatic of black color, were inlaid with spiraling white threads. These threads were 'slightly lifted' by use of a specific tool (such as a needle), twice in the prismatic bead (Fig. 9u) and four times in the ellipsoid one. The ellipsoid bead had a relief, making up a rosette in section. (Fig. 9t). This type of ornamentation, known from ancient times, was called 'bird feather'. Beads of this kind are not frequent. They are known from 10th-12th centuries Hungary (grave 118 at Sarretudvari-Hizofold; Ibolya 2002, p. 278); several examples from medieval Caesarea are kept in the collection of the Hamburg Museum, but without specified chronology (Engle 1990, pp. 18, 96, Fig. 27); also without a specified chronology are the beads from the Israeli Museum of Beads and Other Small Objects (Spaer 1993, Pl. 13, pp. 153, 154).

The winding technique was used also for producing middle-sized ribbed, ring-shaped beads of semi-transparent, yellow glass with a rosette forming in the section (Fig. 9l). Two ribbed green beads originated from pre-Mongolian Bilyar in Bulgar, from the Golden Horde layer (Poluboyarinova 1988, p. 169), single finds of this type are known from Djuketau (Valiulina 2005, p. 92). At many ancient Russian sites, beads of this sort have been dated to the 10th-early 13th centuries (Fekhnner 1959, p. 170); they were present also in Novgorod from the 2nd half of the 11th c. through the 1st half of the 13th c. (Kolchin 1982, p. 168). At Sarkel they appeared from the 10th c. (Lvova 1959, p. 327), in Scandinavia they are dated to the 11th c. (Callmer 1997, Pl. 18 C7) as in Polish Bodzia (Dekówna, Purowski 2015, p. 241, Figs 11.8a; 11.9c).

Middle-sized cylindrical knobby, or blackberry-shaped, beads (8 mm in diameter) numbered 26 examples, 22 of transparent, light-green glass, 3 of transparent, yellow glass, and one black; vertical ribs on the bead surface are additionally crossed by hori-

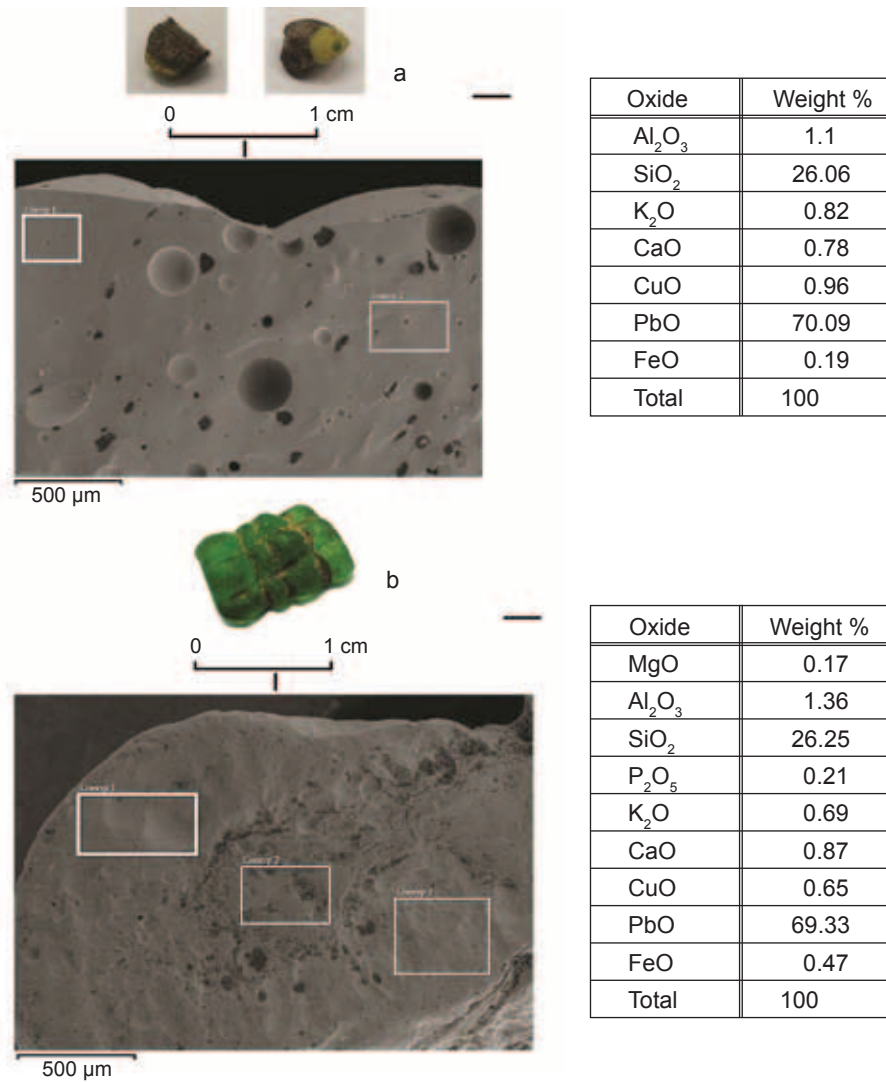


Fig. 10. Electron-microscopic spectroscopy

a – ‘triangular’ bead, inv. no. IZ-2011/52; b – bumpy or ‘blackberry-shaped’ bead, inv. no. IZ-2011/47.
Examined area in frames.

Analyst A.A. Trifonov

zontal rows. These beads are notable for an extremely broad channel and relatively narrow walls (Fig. 9 k). These beads are present at the Izmeri I settlement as well as in small numbers at Laishevo and Murziha settlements; one example comes from Bilyar. The origin of these beads is closely connected with Byzantine workshops in topic studies (Callmer 1997, p. 200, Pl. 18 C6; Shchapova 1998, Fig. 21:9).

Knobby beads from Izmeri I settlement and Bilyar were made of silica-lead glass (Fig. 10b; Valiulina 2005, Table VI 21, 27) as was a similar bead from Szczecin

from the 1st half of the 11th c. (Dekówna 1980, Table 91, no. 380/68). Fekhner dated these beads to the 10th–early 12th centuries (Fekhner 1959, Figs 5–11, appendix V). Beads from the Hungarian Kabaya burial mound in the territory of modern Slovakia (Nevizánszky 1996, p. 277, Pl. VI 2) were dated to the early Arpad period (late 9th–early 11th centuries). As for Slovakia, a necklace of these beads from grave 360 of the Mali Koshi burial mound is dated by the numismatic material from the site to the 2nd half of the 11th c. (Hanuliak 1994, p. 44). A small necklace of light-green knobby and barrel-shaped gold-glass beads was found in Suzdal (Sedova 1997, p. 185, Fig. 71:13).

Beads are abundant in the Gochevo and Gornal' burials (Motsya, Khali-kov 1997, pp. 124, 132–133, Fig. 56:7). One bead of this type was found in the Rozhdestveno I settlement at the mouth of the Mesha River, in the same place that a silver coin of 1046–1056 struck for Henry III of Saxony was found. Most researchers believe that knobby, or blackberry-shaped, beads did not extend in time beyond the 11th c. (Saveleva 1987, p. 149, Fig. 34:75; Kazakov 1991, p. 148, Fig. 47:23; Sedova 1997, p. 185, Fig. 71:13; Zakharov 2004, pp. 45–46).

The most representative beads of the Izmeri type are small and middle-sized ones with triangular cross-section, primarily-zonal beads, owing their triangular form to three equidistant bulging 'eyes' (Figs 11; 10a). Shchapova believes that these beads of Byzantine origin were known from western Europe to Malaysia (Shchapova 1998, p. 153). In Europe, sites and territories yielding finds of triangular beads are extended over a fairly wide area, from the Rhine to the Middle Volga and from the lower reaches of the Danube and the Azov region to the Baltic (Valiulina 2005, pp. 100–103). Based on site chronology the dating of the beads falls in the period from the 9th to the mid-12th centuries. They appeared earlier in the west, at central European sites, and became common from the 10th c., their number dropping gradually after the 11th c. (Krumhantzlova 1965, p. 176). In the east, in the Volga basin, these beads appeared in the middle of the 11th c. Izmeri I settlement has yielded the largest number of triangular beads in the Volga region, making for more than 50% of the glass beads from the site. On other Volgar Bulgarian sites, including Bolgar and Bilyar, finds of this type of beads are rare.

X-ray fluorescence spectral analyses and scanning electron microscopy (SEM) results determined the chemical composition of the triangular beads from the settlements of Bilyar, Izmeri I (Fig. 10a), Laishevo, and Murzikha and from the Vyzkhumsk III burial ground (Valiulina 2008, Table 19, 21–23; Valiulina 2005, Table VI 35–39). The glass was PbO-SiO₂ class with lead oxide reaching 60%. The same composition and proportion of elements was demonstrated for the glass of beads from mound 26 close to Kiryanovo village in the Yaroslavl region, from Kołobrzeg in Poland (Shchapova 1998, p. 152) and from Latvian sites (Mugurevitch 1965, p. 76, annexe II, nos 267:16, 268:2, 268:21).

In the 12th c. a workshop at Kyiv Podil started to produce beads, including triangular ones (Sergeeva 1991); they made single beads as well as multiparted and triangular beads, for which no parallels are known. The Kiev beads were made of PbO-SiO₂ glass. However, a comparative analysis of samples of Kiev and Izmeri I

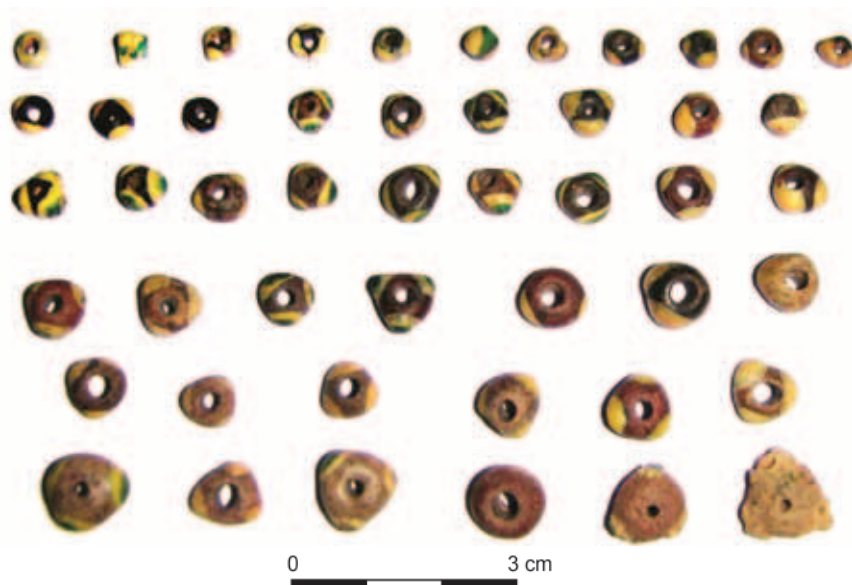


Fig. 11. The 'triangular' beads from Izmeri 1 settlement of the 11th c., inv. no. collection: BSHAMR, IZ /178.

Photo S. Valiulina

settlement beads at the laboratory of the Department of Solid State Physics of the Kazan Federal University has identified raw material and technological differences between the two sets of glass beads, suggesting the independent functioning of the two centres.

The composition of glass of triangular beads from the Danube region is not known. The results of analyses of other types of beads from the 8th–10th centuries graves in Borovce (Slovakia) show that lead-silica glass was used to make a fair number of beads (Staššiková-Štukovská, Plško 1997, pp. 269–271), meaning that the formula was well known in the region (Černá *et al.* 2005, pp. 337–338, col. Pl. 105, group II 6; Table 1, no. 323).

In the 10th–11th centuries, trade routes connected the region of Danube with Kiev, and from Kiev, in turn, there was an active overland route to Bolgar. Perhaps it was the way Byzantine products, including beads, arrived in the Middle Volga region. The Gornalh' cemetery and Gochevo cemetery with a particularly impressive representation of triangular and knobby glass beads can be considered as hubs on the Bolgar–Kiev trade route (Motsya, Khalikov 1997, pp. 132–133).

In the unified trading system of Europe, 'affiliated' production at Izmeri could emerge with the help of newly arrived craftsmen using semi-finished imported products. Triangular and similar beads were represented there by several types featuring the same chemical composition: in addition to the zonal and the ring-shaped brown opaque beads with three yellow-green 'eyes', there are also brown and green beads with yellow 'eyes', dark brown beads with 'eyes', brown and yellow

beads without 'eyes', yellow and green beads; these beads taken together make up 78.8% of the total number of glass beads. They were made of PbO-SiO_2 glass. A smaller part of the collection consists of glass products of the $\text{Na}_2\text{O-CaO-SiO}_2$ class ($\text{Na}_2\text{O-K}_2\text{O-CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$ type).

The assemblage from Izmeri I settlement is determined to a greater extent by beads typical of the 11th c., mainly triangular, blackberry-shaped, ellipsoidal or prismatic black with white symmetrical ornament, zonal opaque with concentric yellow or yellow-green 'eyes', with ciliated 'eyes', all of them made by winding technique. Archaic types are present in small number: segmented and mosaic beads of drawn glass tubes and drawn rods. Based on morphological and technological characteristics, as well as chemical composition of the Izmeri I settlement bead glass, at least two schools of glassmaking, Middle Eastern and Byzantine, can be identified, the latter being clearly predominant. The Izmeri I settlement collection would have been fully classical for the 11th c. had it also included the blue-white rhomboid and gold-glass beads. This set is known from many sites in central Europe and ancient Rus', for example, the Beloozero region and burials of the 11th c. from the Nefedievo and Minino II burial grounds. Particularly impressive in this regard is a necklace from the grave 17 in the Minino II burial ground. However, the Middle Volga sites have yielded no gold-glass and blue-white rhomboid beads save for rare finds from Bolgar.

Sites in Finland (Kyulo, Luistari), which yielded material of the late 10th c. similar to material from Semenovo I settlement, produced beads from 11th c. burials that were close to the Izmeri I settlement collection. However, the parallels for the 11th c. material are not so extensive and complete as for the last quarter of the 10th c. At the same time, links with the Middle Volga are traced in the Bolgar imitation of Arab coins included in necklaces from burial 56 in Luistari and burial 28 in Kyulo (Talvio 2002, pp. 180, 188).

Necklaces from 11th-c. Finland feature some peculiar characteristics, like the presence of a large number of generally blue beads and blue-white rhomboid beads in, for example, burial 56 at Luistari (Lehtosalo-Hilander 1982, col. Pl. III 9). Moreover, there are no triangular beads (only one bead in Luistari in burial 383; Ranta 1998, p. 95, Fig. 3) and knobby beads as well as gold-glass beads are few. According to J. Callmer, after the 10th c. beads came to the territory of Finland from Rus' and the Danube region (Callmer 1997, p. 201). Bead sets for the next stage in the multi-stage European trade were apparently formed in these regions in the 11th c.

Starting from the 11th c., Byzantine goods were supplied to eastern Europe under the control of Kievan Rus'. These changes are reflected in the Izmeri collection: its range is much narrower than in the previous period. For the population of Volga Bulgaria, glass beads continued to be primarily a monetary equivalent in the fur trade and did not become a traditional clothing ornament (Valiulina 2005, p. 118). To ensure trouble-free international trade in Izmeri, a workshop may have been established for the production of triangular beads and some other bead types (ring-shaped and zonal beads made of nontransparent glass of the same homogenous composition as the glass of triangular ones).

On Bolgar sites, parallels for Izmeri beads were most noticeable in Bilyar which had become actively involved in international trade in the 11th c. Thus, the settlements of Semenov I and Izmeri I and their bead collections are a clear indication of the changes in the international trade of eastern Europe in the late 10th and 11th centuries.

Oriental glass vessels came far to the north, to Europe, by the Caucasus route, together with the trade caravans, brought by merchants as personal items or gifts. Finds of such vessels in Birka were known to Carl J. Lamm (1941, Table III). In the Middle Ages, oriental glass decorations and glass vessels of the same origin had a different 'destiny' and mission; they were not included in the basic product range of Islamic glassmaking and were intended for the European markets. The early Islamic glass tableware and lamps, on the contrary, represented by single specimens on sites in eastern Europe, are quite impressive, yet have few parallels that could point to centres of production. To be able to determine the origin and supply routes of early Islamic glass vessels, it is important that these finds be accompanied by synchronous Middle Eastern art pottery. Both categories, glass and ceramics, are mutually complementary categories as regards dating and evaluation of status value. Many studies are based on this property of the Middle Eastern art pottery and glass (Watson 1998; Whitehouse 2012).

In the 10th–beginning of the 11th centuries, objects of Islamic art came to eastern Europe either through the Caucasus or from central Asia. The Caucasian direction seems preferable for Middle Eastern glass production, whereas the central Asian route was fully established later, when products of central Asian workshops started to appear on the market. It is significant that both these directions are well represented in material of 11th–12th centuries date coming from the Samosdelska settlement at the mouth of the Volga, where products of Middle Eastern and central Asian glassmaking are recorded in almost equal number, as attested by morphological characteristics of the objects and chemical composition of the glass (Valiulina, Zilivinskaya 2010, p. 75). Specific land, river and sea trade routes linking eastern Europe with the eastern countries will not be discussed here as there is already an extensive literature on the subject.

Assemblages from Transcaucasian sites, first and foremost Dvin, are particularly important for the reconstruction of routes, volume and dynamics of the eastern glass supply into eastern Europe. The material allows us to consider medieval Armenia as an intermediary as well as supplier of glass products to the north, to the Volga. The North Caucasus region appears to be an important link in this process.

Glass products of the 10th–beginning of the 11th centuries in eastern Europe to the north of the Caucasus are found on urban sites on the Lower (Samosdelska) and Middle Volga (Bolgar, Suvar, Bilyar II). Miniature vessels with carved and overlaid decoration from Bolgar (Fig. 12a, b; Valiulina 2005, pp. 42–43, Fig. 9:1, 2) have direct parallels among similar products of the 9th–10th centuries from Nishapur (Kröger 1995, pp. 132–133, nos 175, 178, 179), the entire Iranian region (Fig. 12c; Whitehouse 2010, Figs 127b, 129) and vessels exhibited in the Victoria and Albert Museum (no. 8274) said to have been produced in Egypt. Similar products from



Fig. 12. Small jars, 'medallion' and glass reference weights

a-c – small jars; a, b – Bolgar, inv. nos NMRT 673/5060, NMRT 8489/1; c – Smith Collection, Strauss Collection in The Corning Museum of Glass; d – 'medallion', Yurmanskoe settlement (chance find), caption the first version: 'Oh, Generous (Gracious), Oh, Eternally Alive' – the names of Allah; the second version: 'Bamah Satnam Nadj'i' – name of the owner (?) – (epigraphic kufi 11th–12th centuries); e-h – glass reference weights: e, f, h – Bolgar, inv. nos BSHAMR, 374–251, 1009-772/270, 246-92/89 (f – caption: 'Hijra year 600'-1203/1204, epigraphic kufi); g – Novo Mordovo, inv. no. BSHAMR, 538-34/184.

Photo O. Gasimov (a, b, d-h); after Whitehouse 2010, Figs 127b, 129 (c); translation: R.M. Kadyrov (d), I.V. Volkov (f)

the collection of the Museum of Glass in Corning were dated to the 9th–11th centuries (Whitehouse 2010, pp. 82–83, nos 127–130). Early Islamic carved glass is represented in Bolgar by a vessel fragment (5.9×4.6 cm) of colorless, slightly yellowish glass (BSHAMR, 255/55). The ornament was carved by slant-cut technique in high relief in a wall 3–4 mm thick in two registers, a figure of a bird (preserved head and luxuriant tail plumage) in the bottom one, and above it, the front paw of an animal. The style was a continuation of the artistic traditions of Sasanian Iran (Valiulina 2015a, p. 412, Fig. 2:6). There are numerous parallels, primarily from the 9th–10th centuries (Kröger 1995, p. 163, Fig. 15; Whitehouse 2010, p. 156, no. 266, p. 197, no. 330).

Bolgar is known for other fragments of carved vessels (B-64, no. 676; NMRT, 14844/21). A special group of early Islamic products with carved ornate decoration is represented by two-layered glass vessels. A fragment of thick-walled vessel had a colorless matrix of sodium ash glass ($\text{Na}_2\text{O}-\text{K}_2\text{O}-\text{CaO}-\text{SiO}_2$) forming the inner layer and an outside layer of lead-silica glass ($\text{PbO}-\text{SiO}_2$), bright green in colour, with lead concentration of more than 64.8%; this made the glass carving process that much easier (Fig. 13a). According to Robert H. Brill, such glass was evidently made to order. In Islamic glassmaking it was used to carve cameos, double-layer vessels and other products (Brill 2001, p. 28). The same glass composition was observed for a ring insert (AKU 217/473) from burial 35 of the 9th–early 10th centuries at the Bol'she Tigany cemetery (Valiulina *et al.* 2014). This class represents special glass in early-Islamic glassmaking, which is rare, but recognizable (Brill, Stapleton 2012, p. 418). David Whitehouse in the book *The Islamic glass of the Glass Corning Museum in Corning* devoted a separate chapter to the items decorated with cameo. Most of the items, preserved in fragments, show a combination of colorless glass with emerald green, rarely with cobalt blue or green and blue; single fragments have a transparent mustard colored or yellow top layer. The vessels are dated primarily to the 9th–10th centuries, some of them to the 10th–early 11th centuries (Whitehouse 2010, pp. 281–328). A 9th c. piece from the Iranian or Mesopotamian regions is held in the Al-Sabakh collection at the Kuwait National Museum (Carboni 2001b, pp. 82–83, Cat. 18a, b). The glass from Samarra in the Museum of Islamic Art in Berlin is dated to the same period (Becker, Kröger 2010; Beuster 2010). A fragmentary inkwell from a mixed layer (BSHAMR, 31–48) should be attributed to early Iranian products. More impressive finds of such products are known from Suvar (Fig. 14a).

Bolgar yielded also three glass weights in the form of a flat round pastille stamped on one side. These objects of early date were assigned broadly to the pre-Mongolian period. One of them (Fig. 12e), a chance find (BSHAMR, 374–251), had a diameter of 2.2 cm and weight of 3.01 g, which corresponded to one 'dirham al-kyle' (Hinz 1970, p. 13). The second one with a diameter of 1.4 cm (BSHAMR, 246–92/89), not fully preserved (Fig. 12h), was discovered in 1979 at excavation site 68, obviously in a pre-Mongolian layer. Both of the weights were made of glass colored by different concentrations of manganese; one is transparent and of pink color, the other black. Both have a round stamp with an irregular deepening in the center on the front side and convex rounded rim around the edge. A third plummet of light

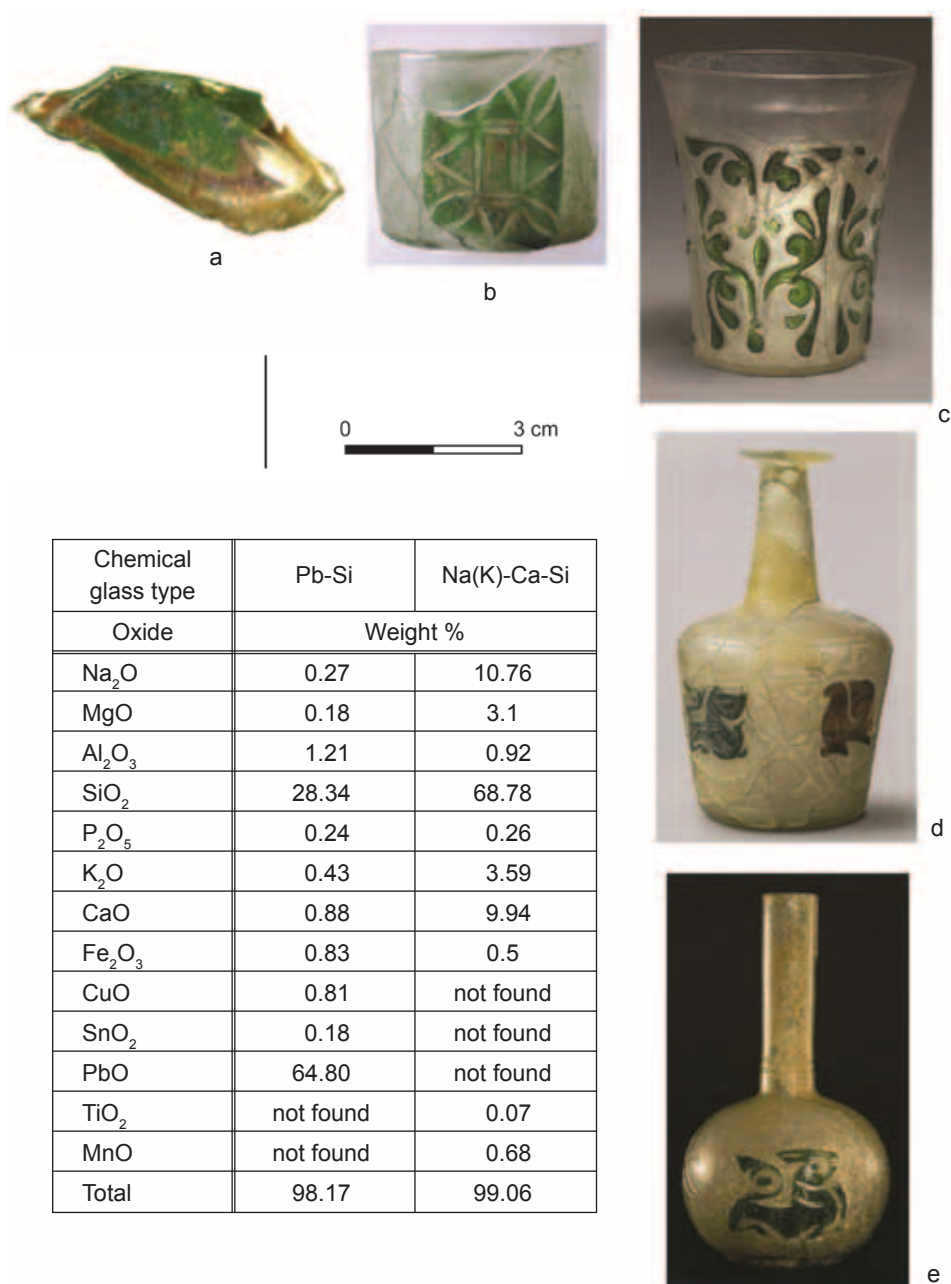


Fig. 13. The vessels of the two-layer glass with a carved ornament

a – vessel fragment from Bolgar – photo and chemical composition (result of SEM), inv. no. B 2014-22;
 b-e – parallels for vessels: b – Samarra, the 9th c.; c – Mesopotamia or Iran of the 9th c.; d – western Asia or Iran of the 9th–10th centuries; e – western Asia or Iran of the 10th–11th centuries.

Analyst A.A. Trifonov; photo A.A. Trifonov (a); after Beuster 2010, Fig. 12 (b);
 Carboni 2001b, Cat. 18a; Whitehouse 2001d, Figs 100, 99 (d, e)



Fig. 14. Inkwells

a – Suvar, inv. no. BSHAMR 1081-271/402; b-c – unknown location of the finds (Iranian region).

Drawing and photo A. Frolov (a); after Carboni 2001b, Cat. nos 33b, 53a (c, b)

green glass had a stamp with poorly legible inscription and a Hijrah date translating to the year 1203/1204 (Fig. 12f).

Glass weights appeared in the East in the 7th c. and were used until the 12th c. They are found in many museums around the world: Metropolitan Museum of Art (Jenkins 1986, p. 53. nos 66–74), Museum of Natural History in Venice, Benaki Museum in Athens, Abgine Museum in Tehran and others. Excavations also regularly yield examples of such plummets, e.g., the finds from Fustat (Shindo, Kawatoko 2010, p. 9, col. Pl. 11:2, 3). It was estimated that the weight of the medallions

corresponded to fractions of silver dirhams (Newby 2000, pp. 30–31, nos 19–24). S. Carboni distinguished medallions from vessel stamps. He considered medallions to be objects with diameters ranging from 4.7 to 10 cm, with impressed images of animals, hunting scenes, horsemen, lute players, 'Shah-nama' illustrations, sometimes with a Kufic inscription around the edge. Texts with the names of rulers give absolute dates. Almost all of these medallions come from Central Asia and Afghanistan and are dated to the 12th c. Finds from the palace complex of the Ghaznavids in ancient Termez are dated to the 12th–beginning of the 13th centuries (Mirzaakhmedov 2011, p. 99, Fig. XIII). Based on the fact that large medallions were inserted into alabaster lattices, they were identified as elements of architectural decoration not only in Termez, but also in Raqqa, Samarra, and various cities of Egypt and western Asia (Carboni 2001b, p. 278). Despite considering them as decorative or status items, Carboni indicated the weight of each medallion (Carboni 2001b, pp. 272–281, Cat. 73a-k, m-s). The second group, vessel stamps, includes objects of smaller diameter, up to 3.5 cm, with a weight corresponding to coins; these items are dated to the 9th–10th centuries (Carboni 2001b, pp. 282–283, Cat. 3.49a-c; 3.50 d, e). Glass 'medallions' also appeared at the bottom (lower part) of vessel handles, the stamp being on the outer side (Fig. 12d), as on products of the 9th–10th centuries from Nishapur (Kröger 1995, pp. 102–103, nos 142–147), Dvin and other places (Dzhanpoladyan, Kalantaryan 1988, pp. 23–24, Table XLI 1–5; Carboni 2001b, pp. 166–167, Cat. 38b-c; *idem* 2001c, p. 20, Fig. 5). In these cases, however, the stamp is usually preserved with part of the handle (Fig. 12d).

There is another explanation for the function of these products. They could have been special service stamps for rationing and weighing medications (Jenkins 1986, no. 6) and sealing food for transportation (Sezgin, Neubauer 2003, p. 169, no. 84). A series of glass vessels with stamp-medallions, mainly on the rims was found in excavations in the Beth Shean trade centre (Israel) in the 1980s–1990s. The finds came from shops and workshops, as well as from a Fatimid–Abbasid and Umayyad bathhouse. In the shops, vessels with stamps were accompanied by small glass and bronze plummets. The excavators suggested the use of vessels with stamps as measure jars for oil. Almost all the stamps have Kufic inscriptions; the name of the Caliph Suleiman was indicated on two stamps. This suggested to the excavators that the workshops were operated under royal patronage (Hadad 2002, pp. 39–40).

All the finds from Volga Bulgaria sites are miniature vessel stamps, according to S. Carboni (Fig. 12d), or plummets (Fig. 12e-h), according to Newby, given their weight which was a multiplicity of dirhams. Stamps are known also from Aga Bazaar (a fair site near Bolgar), Yurmanskoe settlement in the Ulyanovsk region (Fig. 12d), Suvar, and Bilyar. A classic glass plummet from Novo Mordovo is of particular importance (BSHAMR, 538–34/184). The black color comes from casting soda glass of high quality; there is no patina and the shape is a truncated pyramid with two ledges, 1.1 cm high and with a diameter of 2.2 cm. The concave bottom and radial relief were formed as a result of a hole being pierced through the centre of the plummet base (Fig. 12g). Two vertical incisions on the front side, at the base, were probably a designation of the weight. It is equal to 5.64 g, which corresponds

to the weight of exactly two glass dirhams of 2.82 g (Hinz 1970, p. 12). No parallels are known for this plummet, but the chemical composition of the glass and the weight indicate its Egyptian origin. At the same time, it is interesting that its shape is similar to the so-called 'lead plumbs' (plumbs, spindle whorls, plummets) found on Bolgar sites in large quantities. Aleksei P. Smirnov considered these items to be spindle whorls. Turning to the weighted plumbs-plummets from the collection of Vasili Zausaylov, he specified that 'they are of different weight and no regularity in this weight can be traced', and explained the weight coincidences by the fact that 'spindle whorls came from the same mold' (Smirnov 1951, p. 120). Thus, the function of the lead 'plumbs-plummets' still remains a puzzle.

Glass plummets were made to verify coins, primarily, the classic gold dinars, the Mithqal weight of which had to be determined with a high degree of accuracy. This accuracy was provided by glass plummets because they were not susceptible to corrosion. Weighing data for glass plummets of the end of the 9th c. indicates a coincidence of the weight up to a third of a milligram (Hinz 1970, p. 11). Recent research on a collection of Egyptian medallion-plummets identified the product weight and diameter ratios as being compliant with the currency denominations of specific dynasties, and determined the chemical composition of the glass (Vagelli *et al.* 2012). The study has enhanced the informative value of the material as a historical source, especially when it is often fragmentarily preserved. It is also obvious that the particular ratio of glass-forming substances in glass of a common chemical type, $\text{Na}_2\text{O}-\text{K}_2\text{O}-\text{CaO}-\text{MgO}-\text{Al}_2\text{O}_3-\text{SiO}_2$, was intended to provide an optimally high chemical resistance of these special products to corrosion. In accordance with the findings of a recent study, the dating of Bolgar glass plummets can be narrowed down to the 10th-11th centuries.

A fragment of a glass smoother is another early product from Bolgar. The chemical type of the glass (Fig. 15a) corresponds to the composition of European finds of the same type. It is assumed that such smoothers were used to smooth textiles or to grind paint, for example. They were not heated before use. The convex side was held in the hand and the other side was pressed on the textile (Charleston 1984, pp. 37-38; Henkes 1994, p. 337). There is evidence that flat rounded smoothers with a shallow base and a pontil mark were used to straighten paper in the medieval East. A similar fully preserved glass smoother was found in 2007 at Kunya Urgench (ancient Khorezm; Fig. 15b).

At the moment all the early Islamic glass from Bolgar is limited by the considered products. Despite the small number of finds, their presence gives us confidence that this collection will be augmented by finds from future excavations. An interesting collection of Islamic glass comes from the Bilyarsk II settlement located on the outskirts of the modern Bilyarsk village, 1.5 km to the northwest of the external fortification of the pre-Mongolian town of Bilyar. It is a two layered site. An upper layer represents Golden-Horde Bilyar (Bilyarsk III settlement) of the 2nd half of the 13th-beginning of the 14th c., the lower one was dated at first to the end of the 10th-1st half of the 12th c. (Valiulina 2000, p. 284), but it is now clear that the 12th c. should be excluded; the area was not inhabited from the 2nd half of the 11th c.

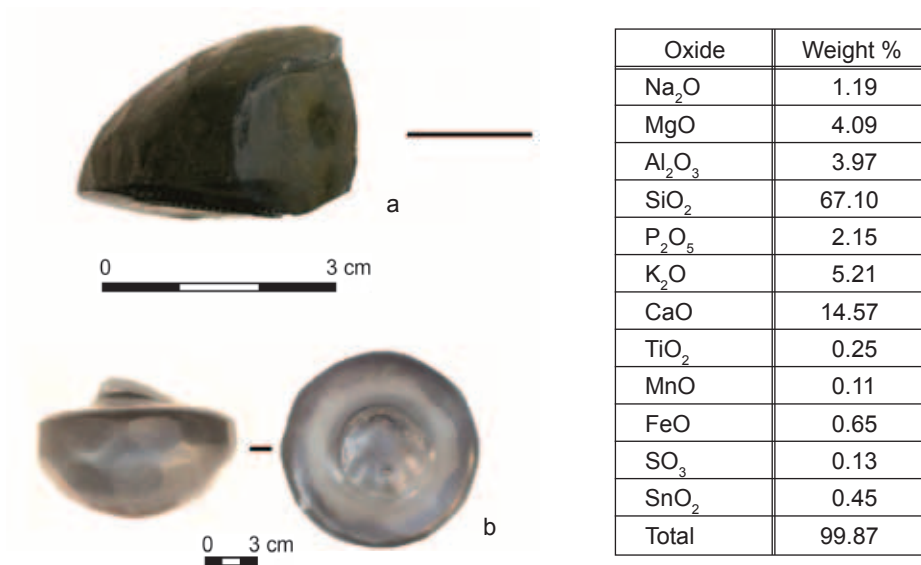


Fig. 15. Glass 'trouser stone'

a – Bolgar, photo and chemical composition (result of SEM), inv. no. CLXXIX 2013-56;

b – Kunya Urgench (Turkmenistan).

Analyst A.A. Trifonov (a); photo I. Volkov (b)

to the Mongol invasion. Both layers are strictly urban in character, reliably dated by coins and archaeological material from the end of the 10th c. to the middle of the 11th c. The collection includes a large number of glass products significant for the times: jewelry, tableware, mostly heavily fragmented. Two oil lamps were well preserved that allowed M.D. Poluboyarinova to reliably attribute them to the category of early Islamic suspended lamps (Begovatov, Poluboyarinova 2014). These lamps have numerous parallels from the 10th–11th centuries (Kröger 1995, p. 182; Carboni, 2001c, p. 20. Fig. 5).

It is significant that luster-painted Mesopotamian clay bowl from Bilyar is dated to the same period and is a rare example of Abbasid luster in eastern Europe (Valiulina 2010). In the 9th–beginning of the 11th centuries, products of Mesopotamian luster were popular in the vast territory of Islamic culture, from Spain to India. Regarding the cultural connections of medieval Merv, Svetlana Lunina reported Mesopotamian luster products being brought to Merv already in the 9th c., as evidenced by a few small fragments among the surface finds (Lunina 1977, p. 127). More significantly, these products are recorded in the Caucasus. The most striking piece is a signed ceramic bowl with luster painting in the collection of the Museum of the History of Armenia, found in a 9th c. layer in the centre of Dvin (Dzhanpoladyan, Kalantaryan 1988, p. 25, Table L). Three other examples of luster painted Mesopotamian pottery are known from eastern Europe: fragments of a 9th c. bowl from Staraya Ladoga, a fragment of a dish from Sarkel found in a 10th c. layer, and a find from Rurik settlement (Koval 2010, p. 187). Early luster products highlight

the supply route to eastern Europe along the Volga and the key points on the Volga–Baltic trade route in the 9th–11th centuries; the Transcaucasia, particularly Dvin, as well as Central Asia (Ibn Fadlan's route), acted as intermediaries in the traffic bringing craft products and other goods from the Middle East to the north (Fig. 5a).

The most important collection of glass of the 10th–11th centuries in the Middle Volga region comes from Suvar. Practically all vessel types have direct parallels among the 10th–11th c. glass from Nishapur, Dvin, Ani, Derbent and some cities of Central Asia. Significantly, other categories of Suvar material culture, primarily the ceramic assemblage, exhibit many similarities with the material from the Caucasus and sites further to the south. The glass collection resembles finds from Samosdelska at the mouth of the Volga (Valiulina, Zilivinskaya 2010).

Suvar was one of the three major cities of Volga Bulgaria. It was located 80 km from the Volga river and was a tribal centre of the Savirs, a group mentioned in the early written sources from the 5th c.; the Byzantines were well aware of the famous 'Savirs' region in the north Caucasus, to the north of the Caspian Gates (Derbent) (Petrukhin, Raevskii 1998, pp. 178, 193). In the 10th c., it was minting coins like Bolgar. The name of the city, Suvar, is similar to the 'property of Suvar' mentioned by Arabic-speaking authors, who located it in the 9th c. to the north of Derbent (Gmyrya 2006, p. 68). Inhabiting the northeastern foothills of the Caucasus and Transcaucasia, the Savirs were in a constant alliance with Iran and Byzantium and were thus under the influence of their culture. The Savirs fought and traded with Armenia and, according to Zachariah the Rhetorician, in the 6th c. they did not consider themselves barbarians (Petrukhin, Raevskii 1998, p. 194).

The rims of two Suvar vessels of green-blue glass with wall thickness of 3 mm belonged to inkwells. The diameter of the opening was small and a wide horizontal ledge laid on the shoulder. One inkwell (BSHAMR, 1081–270/402) had an opening diameter of 2 cm, the ledge was 1 cm wide and the interior was conical in shape. The other inkwell had the diameter of the opening of only 1.3 cm, but a wider ledge, measuring 2.3 cm. Radiating ridges were carved in a 'solar-like' decoration around the hole, presumably extended by vertical stripes on the body (Fig. 14a), but this decoration was not visible on the dark green glass, especially when hidden under the ledge. It could be seen when looking to the light. A direct parallel for the shape and the color of the glass is an Iranian vessel of the 9th–10th centuries from the collection of N.D. Khalili (Carboni 2001b, p. 212, Cat. 53a), which Emilie Savage-Smith refers to as a sphero-conical vessel and interprets as an inkwell (Savage-Smith 1997b, p. 337, Cat. 212). The top of an inkwell of colorless glass, the most durable and recognizable part of the product, with a loop handle, was also found at Samosdelska settlement by E.D. Zilivinskaya in 2010. Intact examples of glass inkwells from the collections of the Museum of Islamic Art in Berlin, from the Louvre, the collection of N.D. Khalili, the Metropolitan Museum of Art and others provide an idea of product shapes and sizes. Vessels could reach a height of 11.5 cm. Their maximum diameter could vary from 4.4 to 9 cm. The loop handles, from one to six in number, were fixed to the shoulders and often to the rim. They were usually cylindrical, but ovoid or sphero-conical-shaped vessels with round bottom and one loop handle

are known from the 10th–11th centuries; from a functional point of view, they were used as lamps and inkwells (Carboni 2001b, p. 212, Cat. 53a; Savage-Smith 1997b, p. 337, Cat. 212, 213). The inkwell from Samosdelska may have been of the same shape as the specimen from the Metropolitan Museum of Art, which was made of colorless pale greenish glass with four loop handles; it had a faceted, slightly squared body in section, was ovoid on the inside, and sported an inserted cylindrical ink container. The body shape and glass color of the vessel resembles faceted bottles, which were imitations of Egyptian crystal wares. Thus, the inkwell was probably of Egyptian origin (Whitehouse 2001b, p. 79, no. 9). However, most glass inkwells are identified as Iranian products (Lamm 1929–1930; 1935). Suvar inkwells find complete parallels among Nishapurian inkwells of the 9th–10th centuries (Kröger 1995, pp. 176–177, nos 129–130) as well as among Iranian imports to Central Asia (Abdurazakov *et al.* 1963, p. 143). The Samarkand Museum possesses at least 3 inkwells (A-109, nos 355, 358, 484) made of yellowish and light-blue glass, of different sizes, with 4 and 6 handles.

A colorless (pale yellow) inkwell, similar to the Samosdelska inkwell, is stored in the Louvre collection (Pasquier 2007, p. 43). Similar examples can be found in the Archeological Museum of Iran, Teheran (Muzeye Irân Bâstân; Sesgin, Neubauer 2003, p. 162); an inkwell made of colorless and green glass is stored in the Al-Sabbah collection of National Museum of Kuwait (Fig. 14b,c; Carboni 2001b, pp. 141–143, Cat. 33a, b). Later on, ceramic inkwells of similar shape appeared in the East, such as the 13th-c. Syrian inkwell with turquoise glaze (Fehervari 2000, p. 178, no. 225).

Significantly, the only known fragment of luster-painted vessel from western Europe came from Suvar (SHM, stock no. 7798, inventory no. 2189/1559). It is a small fragment, 2.6 × 1.4 cm, thin-walled, made of transparent and clear light blue glass with a gold spot on the surface. The luster-painting technique, as well as early luster on ceramics and stone paste, may have originated from the Middle-Eastern centres (Samarra, Damascus), but its production developed mainly in Egypt during the Tulun era, in the 9th and 10th centuries, according to S. Carboni (Carboni 2001e, p. 201).

The early Islamic glass products of the 10th and early 11th centuries are represented in Volga Bulgaria with singular objects: inkwells, lamps, scent bottles, and plummets. The quantity and typology of the artifacts demonstrate that they were brought to the Middle Volga as personal items or gifts from ambassadors and foreign merchants, and were not imported products. Islam was officially adopted in Volga Bulgaria in the early 10th c. Material from burial grounds, studied by Elena Khalikova, shows that ‘during the 10th–11th centuries Islam spread as a religion throughout the main Volga Bulgaria territory, from Samarskaya Luka in the south (Muromskiy settlement site) to the Kama river in the north (Djuketau), and then in the 12th c. north of the Kama river, up to the basin of the Mesha river (Khalikova 1986, p. 150). Urban culture formative processes in Volga Bulgaria, markedly present in this period, must have been promoted by the introduction of eastern cultural values. However, due to the so-called ‘silver crisis’ at the turn of the 10th and 11th centuries, the eastern trade on the Volga significantly declined. At the same time,

along with the establishment of Christianity in Russia, Byzantine culture spread its influence in eastern Europe, extending the Empire's interests to the markets of the Middle Volga and Kama regions, which abounded in furs. Byzantine glass imports (beads, bracelets, seldom vessels), predominated in the assemblages recorded from trade settlements of the 11th c. on the Volga and the Kama rivers, including Izmeri I, Laishevo, Murziha (Valiulina 2008, p. 291), Sengiley and the Mari-El burials. The craft must have been imported with masters brought in and working on semi-finished products. Such contacts are also confirmed by Byzantine coins, stone icons, and elements of belt decoration.

Products of this kind were rare in Volga Bulgarian cities during the formation of Islamic state culture, but there was an increase in the presence of eastern-looking glass tableware in Suvar, Bilyar and other cities. At the same time, the emerging Volga Bulgarian urban culture was not mature enough to perceive the artistic values of Islamic glassmaking of the 9th–early 11th centuries, that is, the luster-painted and carved pieces representing the 'splendid epoch of crystal ware imitation', according to S. Carboni. When demand for expensive, fragile products (which were far from being necessities of everyday life) appeared in Volga Bulgarian urban culture, the artistic styles of the 9th–10th centuries in Islamic glassmaking were replaced by more simple, utilitarian wares of mass production.

In the early 11th c., the decline in trade on the Volga and a growing risk of military attack from Kievan Rus' led to the capital of Volga Bulgaria being moved from Bolgar on the Volga to Bilyar, which was far inland. Bolgar became a peripheral centre, its lowered status reflected in material from the excavation, namely, almost no glass tableware and window-glass in layers of the 11th–early 13th centuries (Poluboyarinova 2008, p. 45). At the same time, Bilyar, Suvar, Muromskij, Staroye Aleykino, and Krasnoye Syundyukovo I strongholds yielded mass finds (in Bilyar and Suvar) or significant quantities of finds of glass tableware and window glass.

The unique opportunity to present a broad set of Islamic glass tableware from the 1st quarter of the 11th c. emerged with the discovery of a merchant shipwreck at Serçe Limani off the Turkey coast, not far from Rhodes. The ship, which went down in 1025, was carrying in its holds, apart from tableware, more than two tons of glass cullet intended for sale in European workshops as semi-finished material (Bass *et al.* 2009, p. 15). By the 1st quarter of the 11th c., the main types, shapes, and decorations of Islamic glass production had been formed and remained unchanged until the middle of the 13th c. Keeping the style and tradition, but using local raw materials (Valiulina 2014), Volga Bulgarian glass production appeared in the 12th c. in Bilyar; it was an integral part of Islamic glass production (Valiulina 2005, pp. 126–139).

PRE-MONGOLIAN PERIOD

The Islamic glass of Volga Bulgarian cities from the 2nd half of the 11th c. to the 1st third of the 13th c. does not present fancy shapes and elegant decoration, exemplifying rather a broad set of everyday dining, perfumery, pharmaceutical, and

chemical wares, along with lamps and window glass. After the magnificent early Islamic stage (luster, cut, etc.), these features generally fit into the mainstream of Islamic glassmaking development, characterized by a tendency toward a simplification of forms and decorative techniques, which is a natural consequence of the increased demand for these products among the middle class and the mass production of everyday glass dishware in particular.

Glass beads did not gain popularity among the population of Volga Bulgaria and this is true of the Islamic world in general. They are represented by a few items only and are not included in the main product classification. There is a wide range of glass tableware in Volga Bulgarian cities, where imports predominantly include products from the workshops of Iran and Syria. The latter could include a tableware 'set' from Bilyar and Suvar: cups, drinking glasses or deep bowls, and piriform bottles. These products were made of green glass, walls 2 mm thick, decorated with horizontal glass threads accentuated with some blue drops for contrast (Fig. 16a, d, j, m).

The role of Iran as a Volga Bulgaria trade and cultural partner from the end of the 12th to the 1st third of the 13th c. is highlighted by luster-painted delftware (Valiulina 2001, pp. 45–48, Fig. 2:2–7), minaiware (Valiulina 1998) and other types, including unique and elegant masterpieces, such as open-worked bowls, decorated with portrait faces, coming from the upper cultural layer at Bilyar (Valiulina, Shlykova [2013] 2015).

In the Volga Bulgarian cities of Bilyar, Suvar, and Muromskii settlement, stemmed goblets and small glasses are represented by the largest number of items (Figs 16a–d, i; 17h–m), all the types having a large number of parallels. Glass vessels with rim-skirting in the lower part of the container (18 pieces) are obviously of Iranian production (Figs 16a–c; 17l, m). Similar wares are kept in the collections of many museums (Israeli 1998, p. 61; Carboni 2001a, p. 172, Cat. 41; Whitehouse 2010, p. 210, Cat. 353). These vessels could serve as lamps, similar to finds from Khorezm (Dashlydzha Depe: Archaeological Museum of the Institute of History of the Academy of Sciences of Turkmenistan, no. 192). Their pontil mark is actually a glass cake, projecting from the base so that the vessel can not stand by itself, but had to be suspended, by the skirting or loop handles near the rim. Lamps of this kind usually have both of these elements.

A large category is made up of table glasses with smooth or relief (faceted or honeycomb) surface, decorated with laid threads and drops of blue color, or of the same color as the vessel body (Figs 16a, d, i, l, m; 17i–s). Such vessels were produced either in Syria or in Iran (Carboni 2001b, pp. 184–185, Cat. 47, p. 190, Cat. 3.25a, b).

Among the bottles, there is a distinctive series of thick-walled vessels of green or blue-green glass with a cylindrical body, sharp shoulders, and almost straight cylindrical neck, ending in a horizontally deflected, disc-shaped rim (Type 1 in the Bilyar typology; Fig. 16k). They are commonly known around the world, from Tunis to China (Carboni 2001b, pp. 146–147, Cat. 35; Kröger 1995, p. 81, no. 108; Bass *et al.* 2009, Pls 11; 12; 26).

Tiny vials with cylindrical necks, intended for incense and medicine, are found in large quantities on eastern sites (Valiulina 2015a, Fig. 3:1–7). Series of vessels

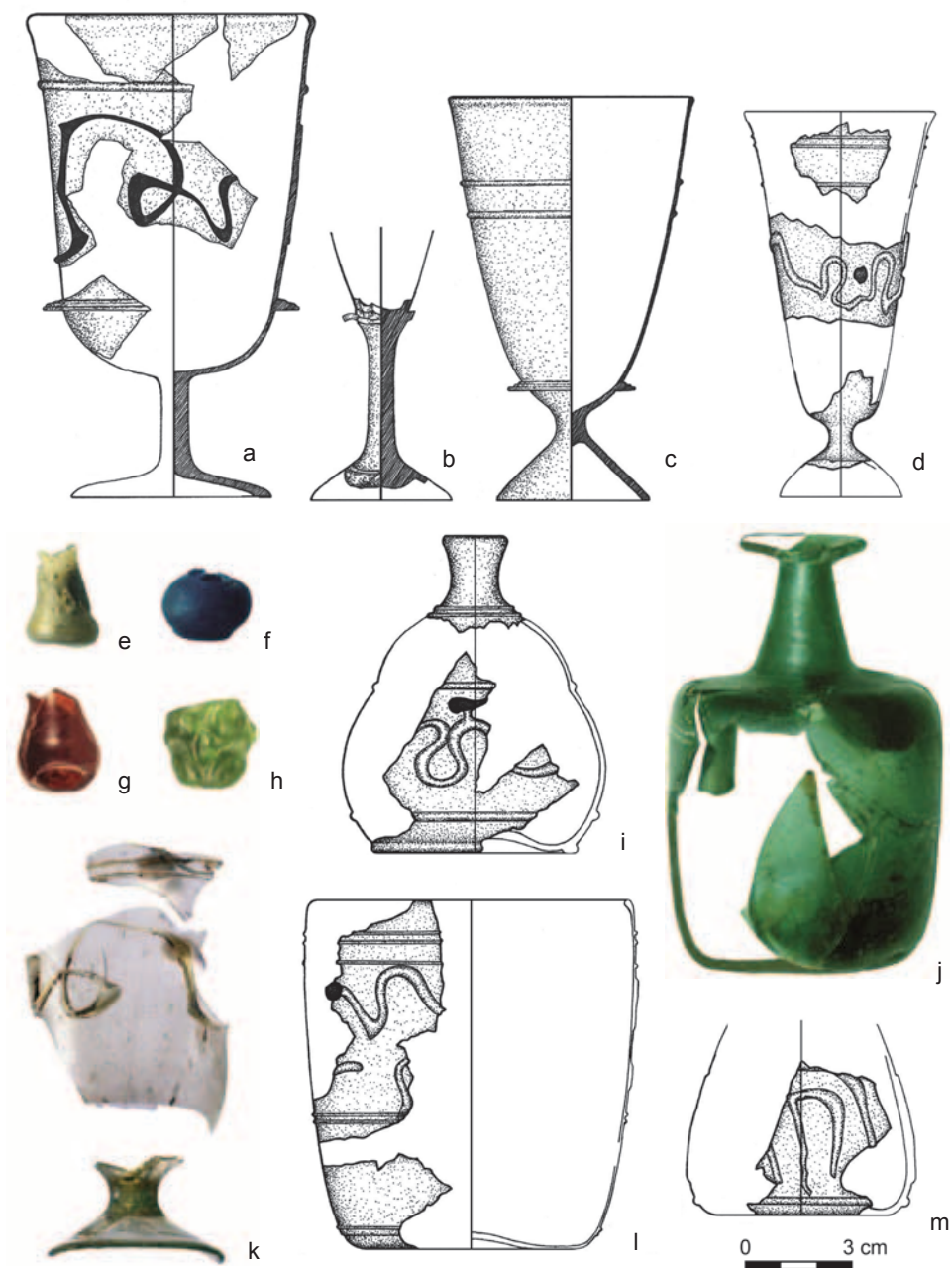


Fig. 16. Vessels

a, b, d-m – Bilyar, inv. nos BM: BXXIII/138b (a), BM: BXXVIII/10996 (b), BM: BXXVIII/10854 (d), BM: BXXVIII/121513639 (e), BM: BXXIII/13639 (f), BM: BXXIII/5869 (g), BM: BXIX/3319 (h), BM: BXXVIII/524 (i), BM: BXXVI A/199 (j), BM: BXXVIII/6838 (k), BM: BXXIII/11176 (l), BM: BXXIII/12539 (m); c – Suvar, inv. no. BSHAMR, 22/124, 11th – the 1st third of the 13th centuries.

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found in Suvar, dated to the 11th–early 12th centuries (BSHAMR, 1084–269/402; 1033–212/402; BSHAMR, 1033–214/402; 1033–215/402; 1033–213/402), strongly resemble the tiny vessels from Nishapur (Kröger 1995, pp. 69–71, nos 81–88), Serçe Limani (Bass *et al.* 2009, Pl. 9), Dzhigerbent (Vishnevskaya 2001, p. 94) and the Tegenetz (author's work with the collection) monastery of the 12th c. in Armenia (excavations of G. Sarkisyan).

Completing the glassware list are jugs, jars and bowls (Valiulina 2005, pp. 37–43). Special chemical utensils: alembics (Fig. 17a-d), decanting flasks (Fig. 17g), tubes and flasks (Fig. 17e), as well as some other vessels found in large number (more than 150 alembics in Bilyar), concentration and archaeological context, allowed detection and investigation of the workshop of an alchemist, jeweler and glass-blower of the end of the 12th–beginning of the 13th c. (Valiulina 2005, pp. 146–165). The crafts character of the place was evident, indicating it was a workshop, not a laboratory, a distinctive feature of eastern alchemy.

Alembics were widespread throughout the territory of Islamic glassmaking, especially from the 9th–11th centuries (Savage-Smith 1997a, p. 42; Carboni 2001b, pp. 144–145, Cat. 34b, c; Kröger 1995, pp. 187–188, nos 239–242; Bass *et al.* 2009, Pls 31, 32). However, despite the large number of alembics found in excavations in Islamic towns, J. Kröger saw at least two problems in the attribution of these vessels. Firstly, the form changed little over time, making precise dating impossible, at least for now, and secondly, there is little information on their use. Assuming their use in medicine and in everyday life (finds from residential buildings suggest the use of alembics to prepare rose water and sherbets), Kröger considered the main application of these products to be alchemical. However, since no complete distilling apparatus, consisting of three distilling vessels, has ever been found, he was of the opinion that the vessels from the collection of the Natural History Museum in London may have formed a kit accidentally (Kröger 1995, p. 186).

The set of sphero-conical vessels and alembics found in the small furnaces of the alchemist's workshop in Bilyar is probably the first find of its kind (Valiulina 2005, pp. 148–151). The correspondence of the diameter of the rim to the head of the spherocone, and also to the diameter of the outlet tube confirms the completeness of the set. Alembics of Bilyar production are distinguished by their mass production and standardization of shapes and sizes (Valiulina 2005, p. 47, Figs 15–17).

Volga Bulgaria cities, especially Bilyar, demonstrate a concentration of finds of sphero-conical vessels and alembics primarily on craft sites, indicating their technical function to be of prime importance. Chemical wares from Suvar include 24 alembics (Fig. 17a-d), a vial (Fig. 17e) and a decanting bottle (Fig. 17g) for liquid decantation (pouring off a liquid, from which a precipitate has settled), furnished with a horizontal rim-skirting, running around the circumference inside (SHM, no. 77908, inventory 2189, no. 1495). The latter finds parallels in Nishapur of the 10th c. (Kröger 1995, p. 109, nos 154, 155), Dvin (Dzhanpoldyan 1974, p. 140), Novogradok (Gurevich 1981, p. 65), and Misriyan of the 12th c. (Archaeological Museum of the History Institute of the Academy of Sciences of Turkmenistan, 1979/M, r-2/180; Mirzaakhmedov 2011, Fig. XVI). Bottles with



Fig. 17. Vessels

a-s – Suvar, inv. nos BSHAMR 228/859 (a-d), SHM 77908-2189/31485 (e), BSHAMR 228/3992 (f), SHM 77908-2189/1495 (g), BSHAMR 228/3039 (h), BSHAMR 228/3052 (i), SHM 77908-2189/1542 (j), BSHAMR 228/3957 (k), BSHAMR 228/3970 (l), BSHAMR 22/1245 (m), SHM 77908-2189/1622 (n), SHM 77908-2189/1342 (o), BSHAMR 228/2897 (p), BSHAMR 228/2897a (q), BSHAMR 228/2897b (r), BSHAMR 228/3026 (s); the 10th–12th centuries.

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horizontal rim-skirting inside of the body appeared as pharmaceutical or chemical vessels in antiquity; they were known also in Byzantium and were widespread in the early Islamic period, being represented in large numbers across south and central Europe during the High and Late Middle Ages as manufacturing and wine containers in winemaking.

All pre-Mongolian Volga Bulgarian cities have yielded window glass. It was a mass product in Bilyar and at Suvar finds of window glass were notable: 67 examples from an excavation area of nearly 300 square meters, most probably because A.P. Smirnov's work concentrated on the most monumental building on site, the so-called Suvar 'Palace'.

The collection of Suvar glass goods (Figs 14a; 17a-s) is closely related to that from Bilyar, but it is at the same time more limited in range and less utilitarian in character. Located far from the Volga trade route, Suvar does not have such a rich collection of early glass beads and other adornments (rings and bracelets). Only two bracelets have been found in the settlement: both black, one was smooth and round, flatly bulging in section, another one was round, flat-convex in section, with polychromic, spotted decoration in slanting lines, the decoration slightly bulging. Bracelets of this kind are known from Sarkel/Belaya Vezha, Baylakan town, the museum display at Nevşehir (Turkey). In Palestine, such bracelets are referred to as Islamic glass bracelets (Spaer 1992, p. 51, Figs 8; 25:14).

Suvar has also yielded large quantities of glass perfume, table and chemical wares, as well as window glass, mainly of the 11th and 1st half of the 12th centuries. There are also few imports of glazed ware; more than 300 fragments of earthenware vessels with luster painting of the 2nd half of the 12th c. are rare and there is absolutely no Russian glass. The city was never mentioned in Russian chronicles. This may be taken as a chronological indicator of city status, changing approximately from the middle of the 12th c., when Suvar, like Bolgar, yielded primacy to Bilyar, and was turned into an ordinary town.

In the Middle Volga region, the most representative collection of Russian ancient glass comes from Bilyar. It includes tableware and window glass, jewelry (beads, bracelets, rings; Valiulina 2005, pp. 119–120). The chemical composition of jewelry glass indicates the following two types: PbO-SiO_2 and $\text{K}_2\text{O-PbO-SiO}_2$, while vessels and window disks belong to the $\text{K}_2\text{O-PbO-SiO}_2$ type. Glass vessels (21 pieces) are represented by examples of the most typical shapes in Rus' (Fig. 18a-j).

First are the open lamps with pointed base and spiral corrugation. Five pieces come from Bilyar (Fig. 18c-g), dated by stratigraphic data and archaeological context to the 12th–early 13th centuries. In Russian cities, most of such wares come from the 2nd and 3rd quarter of the 12th c. (Shchapova 1997, p. 31). They are most common in Novgorod, but seldom found at other ancient city sites.

Glasses without flat bottom formed most of the Russian tableware at Bilyar (Fig. 18i). Two fragments obviously belonged to glasses of different shape (Fig. 18a, j). These were narrow cylindrical vessels on a narrow flat base with a high conical pushed in base and hollow base, slightly flared walls which could have a fold along the edge (Fig. 18j). This form is considered by researchers as a leading one among

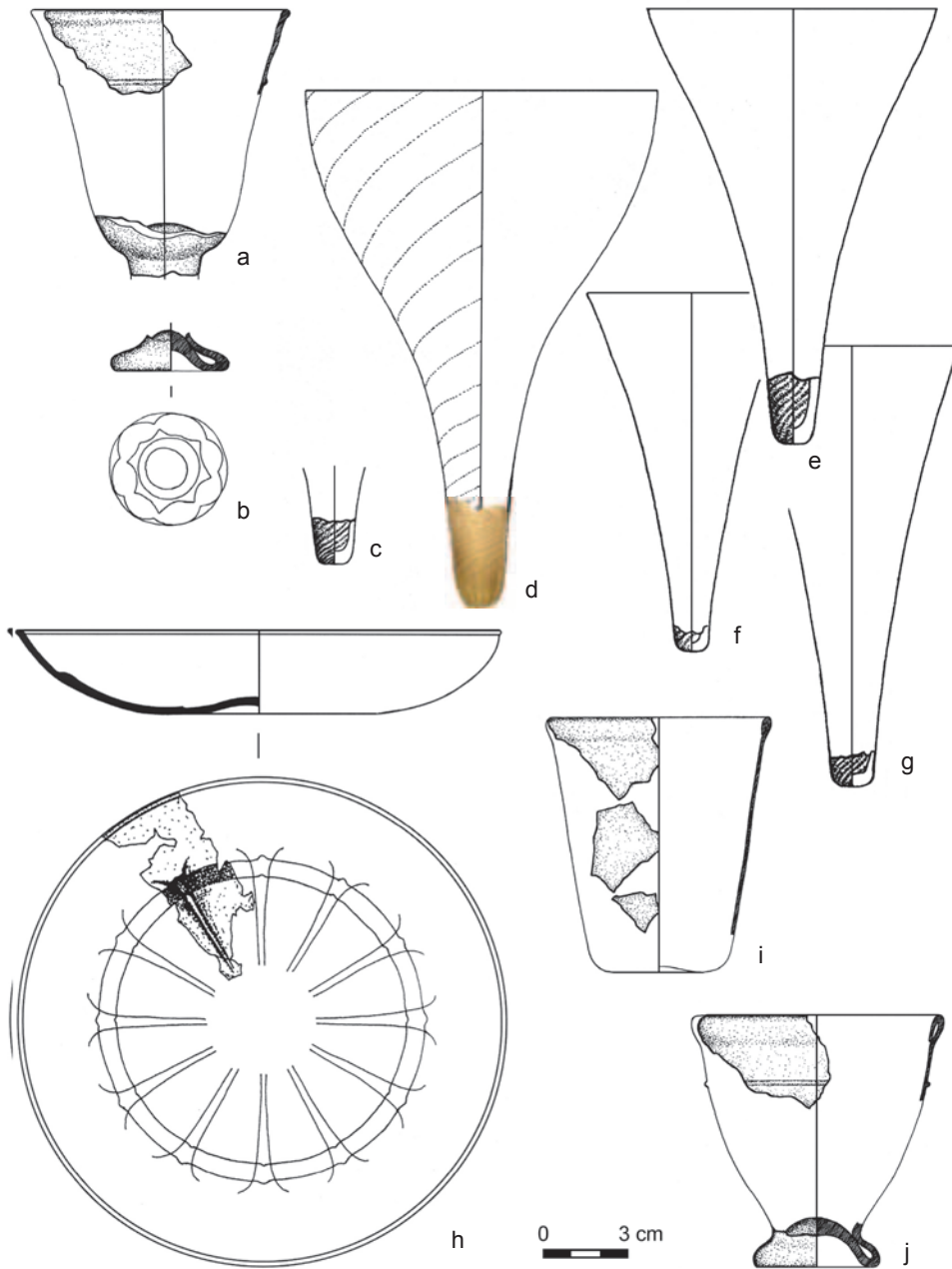


Fig. 18. Russian glassware (a , c-g, i, j) and Byzantine glassware (b, h) from Bilyar, 12th-the 1st third of the 13th centuries

inv. nos: AKU285/214 (a); NMTR 5560, AA 54-3 (b); BM: B.XXIII/12318 (c); BM: BXXIII/1705 (d); BM: B.XXIII/6228 (e); AKU285/1052 (f); BM: BXXIII-81/13644 (g); BM: BXXIII/1317 (h); BM: BXXIII/9625 (i); AKU285/715 (j).

Drawing and photo T. Valiulin

the glass tableware of south Russian towns. Shchapova dates the emergence of such vessels in Rus' to the 2nd half of the 12th c. and sees Byzantine cups as the original prototype. All the finds of Russian glass came from the central part of the settlement, most of them found in houses of Russian merchants nos 3, 5, 8 in trench XXIII. The landlords obviously traded in amber: about 8 kg of raw amber was found in the cellars of the building. A unique find from this area was the seal of Novgorod Prince Vsevolod of 1221. Objects of everyday use and pig bones were also found, the latter quite exceptional in a Muslim city.

Products of Byzantine workshops also came from trench XXIII. The only glass plate from Bilyar (Fig. 18h) was attributed to Russian glass by its chemical composition (K_2O - PbO - SiO_2) and the nature of the surface, but the rich decor in the form of radial ribs in relief and an enameled brown-purple rim in the central part pointed to its Byzantine origin, as did a similar plate from Novogradok.

Another find, presumably Byzantine glass, had a base with cut holes (Fig. 18b). A few other objects may have been of Byzantine origin as well (Valiulina 2005, Figs 25:6; 16:2).

Byzantine glass products could have reached cities in Volga Bulgaria from Sarkel/Belaya Vezha and the Chersonesus (Kazhdan 1991, p. 853) by routes known from the times of the Khazar Khaganate, as well as from Transcaucasia. Joseph Philippe notes that the Volga, which was of great importance in the eastern trade, provided a bridge for Byzantine goods and cultural traditions from Transcaucasia (Georgia, Armenia) going to the north (Philippe 1970, p. 176). Rare finds of Byzantine glassware and glazed pottery can hardly be a reflection of the direct and permanent contacts of the Empire with the Volga region. Articles of western production, such as Byzantine glassware, window glass and western-European stained glass reached Volga Bulgaria mainly through Russian territory.

Especially impressive in the Bilyar glass collection are the products of Georgian glassmakers. No category of archaeological material allows us to reveal so confidently the connections of middle feudal Georgia as the Georgian window glass and some samples of lamps and tableware from Bilyar. The relief-‘waffle’ Georgian window glass comprises about a seventh of all the Bilyar window glass (window disks). Finds of these expensive imported products are densely concentrated mainly in trench XXXVIII, where excavations uncovered a large brick building (possibly a palatial structure) located in the centre of the settlement. Relief window glass finds the most direct parallels with the production of Georgian craft centres and cities, where these products were used. Bilyar glass windows are the closest to glass from the palace in Nadarbasevi, a summer country residence of Queen Tamar.

Judging by the glass finds from Dvin, the Armenian capital of the 8th–10th centuries was the largest centre of crafts and trade in the Transcaucasia in the 5th–13th centuries and played a special role in Bilyar’s international relations. Practically all types of Bilyar glass products are represented in the Dvin material. The similarity of the assemblages from the two distant centres is explained by the stylistic unity of medieval eastern glass. Like the other Transcaucasian centres, Dvin may have also acted as an intermediary in bringing Byzantine products to the Middle

Volga region. Transcaucasia was a hub providing international contacts between eastern Europe and western Asia. According to the Armenian and Arab 'road maps', Dvin held a key position in the transit trade through the Caucasus. It operated several trade routes, including those from Dvin to Partav, Shemakha, Derbent, to the Caspian Sea and the Volga (Dzhanpoladyan 1974, p. 27).

Volga Bulgaria was connected to the East also *via* the important Volga Bulgaria–Djurdjania route (southeast of the Caspian Sea), which led to Central Asia, Iran and Iraq, where it merged with the so-called Great Silk Road. Every year excavations in Volga Bulgarian cities bring an ever-growing body of evidence of constant and close connections with numerous handicraft centres in Central Asia. Central Asian glassware found in Bilyar encompassed large jars, bottles, a lamp and window glass beside glazed ware and belt sets (Valiulina 2005, pp. 124–125).

Glass plays a special role in determining the directions and dynamics of trade connections and the nature of trade and exchange. An analysis of Volga Bulgaria's international relations based on glass finds reveals significant changes in Bulgarian trade in the 11th through early 13th centuries and its impact on all aspects of public life. Glassware, window glass, ornaments reflect the geography of international contacts of Volga Bulgaria: Rus', Byzantium, the Middle East, Transcaucasia, Central Asia, highlighting the prime importance of the Eastern direction. The proclamation of Islam in Volga Bulgaria contributed to the development of closer and more comprehensive relations with the East. A common social and cultural environment, the connection between commodity production and commodity markets caused a rapid spread of artistic styles and production technology throughout the East. One striking example of this process is Volga Bulgaria's own glassmaking.

Within this stylistic tradition the Bulgarian production appears in Bilyar in the 12th c. – as a part of the Islamic glass manufacturing (Valiulina 2005, pp. 126–139), based on raw material resources of the lands over the middle Volga and Kama rivers (Valiulina 2014).

THE GOLDEN HORDE PERIOD

After the Tatar–Mongolian devastation, Bolgar developed rapidly, becoming the centre of Bolgar lands as part of the 'Golden Horde' from the 1240s into the 15th c. A rapid 'barbarization' of urban culture took place. Glass adornments now exceeded finds of window glass and tableware a dozen times over. Own production of glass beads and rings started up in Bolgar in the 1340s (Fig. 19a-h; Poluboyarinova 2006). Glass chemical composition analyses indicate that workshops were using semi-finished material supplied from the lower Volga glassmaking centres of the Golden Horde or from Central Asia (Valiulina, in press).

Another feature of the Bolgar glass collection is a minimum of everyday dining ware seen in the context of limited dining ware in general. This feature makes Bolgar different from the lower Volga capitals of the Golden Horde, where there is a large amount of dining ware, the greatest part of which are simple everyday vessels



Fig. 19. Products from the glassmaking workshop in Bolgar, the 40s of the 14th c.

a-e – beads; f-h – rings.

Photo A. Frolov

(Busyatskaya 1976, pp. 50–54). Lamps and imported festal ware predominate among the vessels in Bolgar. According to M.D. Poluboyarinova, simple everyday dining ware forming group I (Fig. 20a-c) is three times less common than the Syrian and Egyptian products, lamps and vessels, decorated with gold and enamel ornaments, considered as group II (Figs 21; 22; 23). These finds come from buildings and other features of the 2nd half of the 13th–early 15th centuries (Poluboyarinova 1988, pp. 208, 211, Figs 91–94; *eadem* 1993, pp. 178–181, Fig. 1).

During the Golden Horde period window glass took on relevance in view of an active stone building industry. Pieces of glass disks, 18–19 cm in diameter, inserted in lime–sand mortar frames (Fig. 24b), were found during the excavation of a 14th c. structure designated as the Black Chamber (Fig. 24a). Window glass of greenish-blue hue (Fig. 24d, e), and also bright emerald green and purple red glass (Fig. 24c), originated from the Golden Horde layer and from monumental architecture in the city centre. This type of window glass was imported to the lower Volga cities, as well as to Bolgar, probably from Central Asia. Expensive prestigious glass products along with other imports, such as glazed ceramics, and mosaic tiles as well as the monumental architectural complex were aimed at raising the status of Bolgar.

In other Volga Bulgarian Golden Horde and post-Horde cities glass products were represented only by glass adornments, that is, beads (Fig. 25) and pendants. Single fragments of glass dining ware, both colorless and colored, decorated with enamel and gold paintings, were also found in the Golden Horde Bilyar III settlement (Valiulina 2000) and the 15th c. town of Toretsk. The rim of a vessel, a lamp probably, featuring an etched ornament, came from Toretsk (Valiulina 2013, p. 26, Fig. 1:35) and an enamel-painted fragment of glass originated from the Old Kuibyshev settlement (*Glassware...* 1997, pp. 31–33; BSHAMR, 642–1217/177).

Vessels of clear, transparent, manganese purple-lilac or cobalt-blue colored glass, the surface which was decorated with an ornament of horizontal threads of white opaque glass, were recorded from the Golden Horde layer at Bolgar. Threads were often ‘combed’ with a special tool, forming a decoration resembling bird feathering (Fig. 21a-g). Vessels with similar ornamentation, tiny vials of Syrian and Egyptian



Fig. 20. Products of Central Asian workshops from Bolgar, the 2nd half of the 13th–14th centuries
 a – sumac – child hygienic vessel, inv. no. BSHAMR 508-92/240; b-c – dining vessels, inv. nos B.CXCVI/1324 (b),
 CXCVI/1311 (c).

Photo A. Frolov

production, were produced in the 7th and 8th centuries (Carboni 2001a, Cat. 3.63a-c). Later, in the 9th–12th centuries, figures of birds were decorated using the same technique (Carboni 2001b, pp. 302–303, Cat. 79), in the 12th–13th centuries chess figures had the same ornamentation (Jenkins 1986, no. 62; Carboni 2001b, pp. 306–307, Cat. 81), rarely bowls and other open vessels (Carboni 2001b, pp. 308–309, Cat. 82a-c; Khalili 2008, p. 104).

The most numerous vessels from the 7th to the 13th centuries were closed vessels, namely small and elegant toilet bottles for aromatic oils and medicine (Lamm 1929–1930, p. 292, Pl. G.2; *idem* 1941, p. 61; Marçais, Poinssot 1952, p. 404, Pl. LXII 4; Kühn 2010b, pp. 154–155, Cat. no. 46; Carboni 2001b, pp. 310–311, Cat. 83a-c; *idem* 2001d, p. 106, Fig. 94). An early example is a Syrian toilet vessel on four short legs,



Fig. 21. Products of the Middle Eastern workshops (Syria, Egypt) from Bolgar, the 2nd half of the 13th–beginning of the 14th c.

a, b, e – bottles, inv. nos BSHAMR 289-433/103 (a), 289-434/103 (b), B. 2014-391 (e); d – lamp, inv. no. B 2014-483; c, f, g – fragments of vessels decorated with ‘feathers’, inv. nos NMTR 68-32/8/12 (c), BSHAMR 305-17/119 (f), BSHAMR 642-1216/177 (g).

Photo O. Gasimov

with a lid (11.5 cm high) and rim diameter of 5.1 cm, dated to the 11th–12th centuries. This bottle, kept today in the collection of the State History Museum in Moscow, originated from the Zmeysky catacomb burial ground in North Ossetia (Zhuravlev 2012, p. 155, no. 390).

Perfume bottles decorated with opaque white threads often had a narrow cylindrical or conical round, or faceted body and a small base. A significant number of such items date to the 13th–14th centuries. Together with enamel-painted vessels, they are considered typical of the Mamluk period (Whitcomb 1983, p. 103, Fig. 2b, cc-ee, mm-pp), e.g., artifacts from Fustat in Egypt (Shindo, Kawatoko 2010, p. 8, col. Pl. 9:12). Three thin-walled bottles (Fig. 21a, b, e) of manganese color, decorated with opaque white ‘feather’ painting, come from a 14th c. feature in Bolgar and are themselves reliably dated to the 14th c. by Middle Eastern parallels (Carboni 2001b, pp. 312–313, Cat. 84). More than 30 fragments of vessels with similar decoration, both thin- and thick-walled (2–3 mm), have also been recorded from Bolgar.

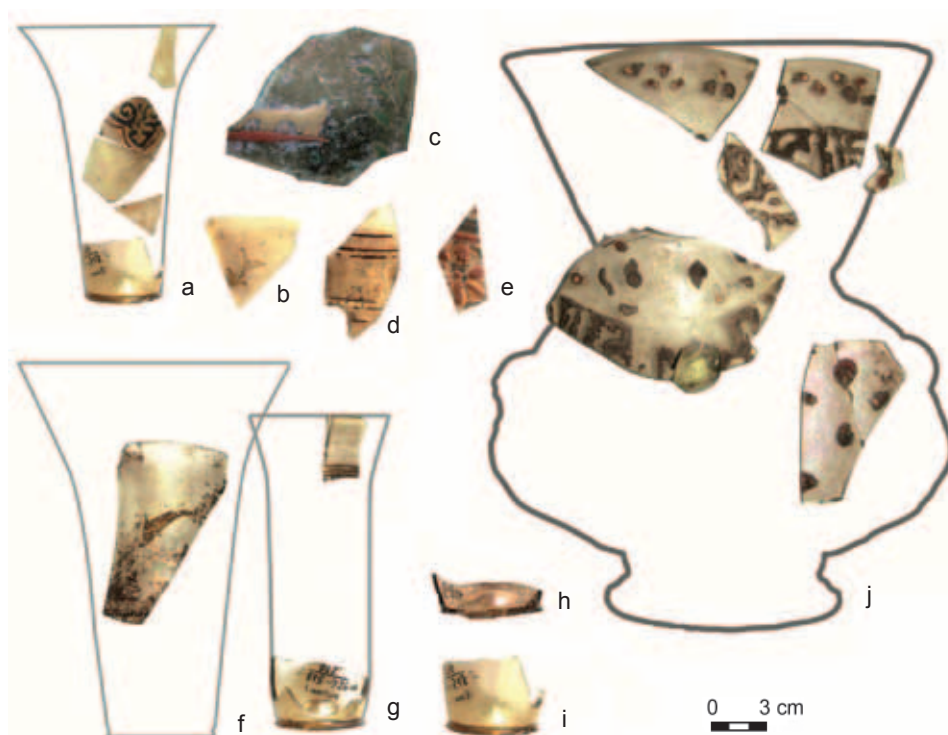


Fig. 22. Products of the Middle Eastern workshops (Syria, Egypt) from Bolgar, the 2nd half of the 13th–the 1st half of the 14th c.

a-i – vessels, inv. nos CXCVI/1208 (a), 734-402/270 (b), 1291-11/270 (c), 194/85 (d), 163-14/270 (e), CXCIX/1261 (f), BSHAMR 926-518/270 (g-i); j – lamp with gold and enamel painting, inv. no. B1967/1463.

Photo O. Gasimov

Similar bottles were discovered during excavations in Dvin; parallels have been noted at all archaeological sites in the Near East (Dzhanpoladyan, Kalantaryan 1988, pp. 22–23, Table XXIX 3, 4). Sphero-conical vessels from the upper pre-Mongolian horizon at Bilyar were also decorated with a feather ornament (Valiulina 2005, p. 48, Fig. 21:3). Small-based vials were placed on ceramic or stone stands, such as a steatite stand with Kufic inscription along the edge, dated to the 8th–9th centuries, now in the Benaki Museum in Athens and intended for an Egyptian perfume vial (*Benaki Museum* 2006, p. 83, no. 81). A great number of fragments of vessels with feather ornament were found in the Tzarevo and Selitrennoye settlements; the glass matrix there was not only of lilac or blue, but also of mustard color. Small, but recognizable pieces of similar vessels were found in Beloozero (Zakharov 2004, p. 157, Fig. 332:12), Novogrudok (Gurevich *et al.* 1968, Table XII 20), and in Vladimir. Among other fragments of vessels, there is a fragmentary lid, for a small round vessel, made of blue glass with opaque white ‘feather’ decoration (Nosov *et al.* 2005, pp. 60–61, Table IV 11, 12). A complete sample is found in the collection of the Metropolitan Museum of Art in New York (Jenkins 1986, no. 45), but these



Fig. 23. Products of the Middle Eastern workshops (Syria, Egypt) from Bolgar, the 2nd half of the 13th–the 1st half of the 14th c.

a-d – fragments of vessels decorated with gold and enamel painting and epigraphic inscriptions: a – Al-Mulk (possibly part of the name of Allah 'al-Maliki – Mulk' – the holder, owner of all the wealth, epigraphic naskh of the 12th–13th centuries); b – [bi] Maulana ISMI [Allah] – 'In the name of our Lord [Allah]' (epigraphic naskh of the 12th–13th centuries); c – [And] Maulana – 'Oh, our Lord' (epigraphic naskh of the 12th–13th centuries); d – [if – Murad...] ... for Murad (epigraphic naskh of the 12th–13th centuries); inv. nos BSHAMR 358-106/295 (a), BSHAMR 358-107/295 (b), BSHAMR 358-105/295 (c), BSHAMR 672-1115/177 (d).

Photo O. Gasimov, translation R.M. Kadyrov

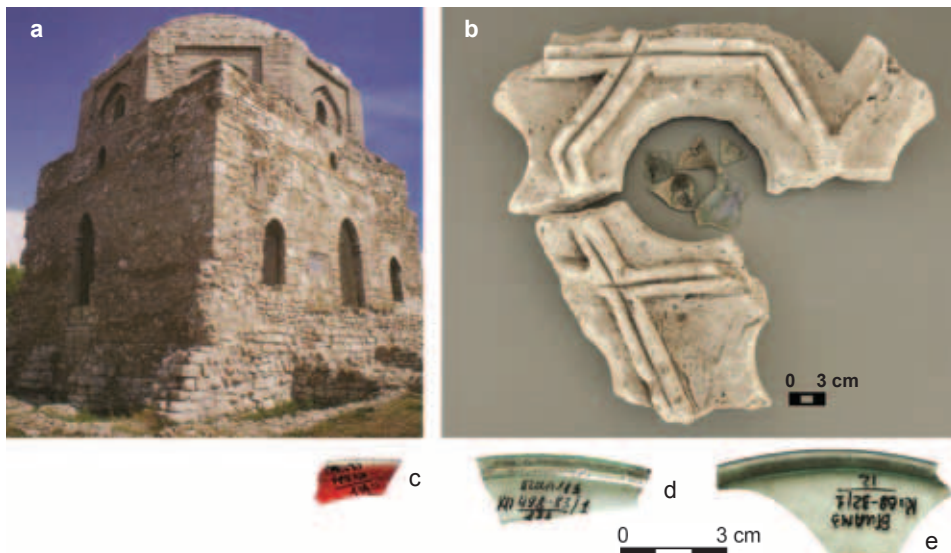


Fig. 24. Bolgar – 'Black Chamber', the 14th c.

a – 'Black Chamber'; b – plaster frame, inv. no. BSHAMR 68-32/4/12; c-e – window glass, inv. nos BSHAMR 194/530 (c), 498/83/1 (d), 68-32/1/12 (e).

Photo O. Gasimov



Fig. 25. Beads from the glassmaking workshop in Bolgar.

Photo A. Frolov

fragments could also belong to the shoulders of a bottle similar to the one from Bolgar (Fig. 21a, b). At east European sites, vessels with feather decoration, as well as ones (they appear at the same period) decorated with gold and enamel, often come from the Golden Horde layers. These types of vessels are identified as the last stage of Islamic glassmaking, from the mid-13th to the 15th centuries.

One of the late objects from Bolgar (trench 179, Late Golden Horde layer excavated in 2012) is a fragment of vessel wall made of colorless glass decorated with a dense 'carpet' enamel ornament composed of rows of hexagon-shaped figures, each of an opaque white enamel oval within a golden and dark-red frame. The hexagon-shaped figures are filled with a nontransparent light blue or transparent bright-green enamel from within, with a drop of dark red enamel placed in the centre of each figure against a golden background, and alternating blue and green stars. Chemical elements: Cu, Fe, Sn, Co, Au, and their compounds, responsible for each color in the ornament, have been identified in scanning electron microscopy. The results correspond to published earlier data on enamel chemical composition (Newby 1998, p. 36, Table I; Suzuki *et al.* 2010, pp. 44–46, Table 2:1, Pls 1; 2). The fragment is 2.5 mm thick and represents the turn of the flat body wall either to the bottom or to the shoulders of the vessel. It may be reconstructed as a flat vessel, or one of large-diameter, perhaps a candlestick. The chemical composition and nature of the ornament reveal similarities between the Bolgar vessel and products made of blue glass, a perfume bottle from the Civic Museum of the Middle Ages in

Bologna, glasses of Syrian production from the Victoria and Albert Museum and from the Corning Museum of Glass (Newby 1998, p. 38, Figs 10.5; 10.6; 10.7c; 10.7e; 10.8–10.10), and a fragment of a vessel from Syria or Egypt from the middle or late 13th c. (Carboni 2001b, p. 348, Cat. 94e). The ornament of the Bolgar vessel is somewhat similar to the decoration of a candlestick made of colorless glass (maximum diameter 20.6 cm), probably of Egyptian production, made in 1340–1365 and kept in the Corning Museum of Glass (Carboni 2001e, pp. 270–272, no. 134).

Entire series of cylindrical glasses with enamel painting were found in Bolgar (Fig. 22a, f-i). Such vessels with widely flaring rims were blown from high-quality colorless glass, which had a light pinkish and at the same time yellowish hue, attesting to manganese used as a decolorant in the glass. The glass bases from 4 to 5.5 cm high, rounded and concave, furnished with a narrow ring-shaped stand, were usually better preserved. The fragmentary walls were painted with various motifs: epigraphic, floral, zoomorphic (images of fish) and geometric (combinations of horizontal lines and dots, which were drops of thick enamel; Figs 22a-g; 23a-d).

Interestingly, pre-Mongolian Bilyar, which was destroyed in 1236 and was not rebuilt, has not yielded similar finds despite the abundance of eastern products, including ones of high artistry (Valiulina, Shlykova [2013] 2015), found in layers from the last quarter of the 12th c. and the 1st quarter of the 13th c. The same trend is notable in all pre-Mongolian Volga Bulgarian cities, which, like Bilyar, became 'closed complexes' after the Mongolian devastation. Only singular fragments of vessels with golden and enamel painting are present in Golden Horde Bilyar of the mid 13th–early 14th c., which is one of the early Golden Horde fiscal-administrative centres in the Middle Volga region. The city located 1.5 km north of the ruins of pre-Mongolian Bilyar is a single-layer site and represents an early Golden Horde urban culture (Valiulina 2000). The only vessel found in pre-Mongolian Bilyar is a plate, the edges of which were decorated with lilac enamel (Fig. 18h). An identical plate from the mid-12th c. is known from Novogradok (Gurevich 1981, p. 96, Fig. 74:1). Both vessels are Byzantine products, originating probably from the same workshop (Valiulina 2005, pp. 40–41, Fig. 13). These facts are important for understanding the origins of enamel-painted Islamic glass, which was formed under the influence of Islamic and Byzantine artistic traditions (Gudenrath 2006, p. 47).

Magnificent glass lamps, 35–38 cm high and 20–26 cm in diameter, and a wall-thickness of 2–3 cm, made of colorless glass with gold and enamel painting, featuring a rounded body on a stand or without it, a high and wide bell-mouth and usually six loop handles for suspension, were brought to Bolgar and other cities of the Golden Horde from the countries of the Islamic East (Poluboyarinova 1993, p. 178). No finds of the kind are known from other eastern European sites.

In Armenia, works of Islamic art from Syria and Egypt, i.e., glasses: bowls, and lamps, decorated with enamel and gold with Koranic inscriptions were identified during excavations not only in the palace complexes of the Ani citadels, but also in orthodox churches (Dzhanpoladyan, Kalantaryan 1988, pp. 24–25, nos 64–76, Table XLIV 1–9). Examples are also known from the Christian sites in the Middle East.

Interestingly, two types of suspended oil lamps were used in the Islamic East of the 13th–15th centuries: a peculiar Islamic massive form and icon lamps rooted in an early Byzantine tradition, in the shape of small cups with central hollow or solid stems. Combination of these two lamp types was depicted in book miniatures (*The Pierport Morgan Library*, 638/21). In an Iraqi miniature of 1222/1223, depicting interior of the Al-Hariri's assembly, there is a lantern composed of three icon lamps hanging between two Islamic lamps (Rice 1993, p. 108, no. 106; *1001 Inventions...* 2006, p. 59). A Timurid miniature of the 15th c. shows another parallel (Bacci 2009, p. 436). Lamps of the icon type, put into bronze polycandela, were known in Egypt from the 4th c. and are present in Fustat materials from the 9th–10th centuries (Pinder-Wilson, Scanlon 1973, p. 22, Figs 18; 19). They have been found on the shipwreck in Serçe Limani (Bass *et al.* 2009, Pl. 29) and in pre-Mongolian Bilyar (Valiulina 2005, pp. 50–51, Fig. 22:5, 6) as well as recently at Bolgar (BSHAMR, 689–487/259; 1361–259/412).

In addition to the utilitarian and aesthetic functions of the illumination device, glass lamps were intended to be symbolic as well. Many Islamic lamps decorated with enamel and gold bear the name and emblem of the donator, and a Koranic inscription: 35th ayat from the 24th Sura, where the light of Allah is compared to a glass lamp in niche (*The Ashmolean Museum* 2000, p. 74; Khalili 2008, p. 108; Kühn 2010a, p. 20; Müller 2010, p. 164, Cat. 51). It is no coincidence that the image of the lamp in a niche is a frequent motif on ceramic tiles, carpets, textiles, as well as in stone and wood carvings in the Islamic East. One of the earliest images on the Mihrab ceramic tiles from the Louvre collection dates to the 13th c. (Peltre 2006, pp. 92–93).

Only secular vessels, like glasses, vials and bowls, were found on eastern European sites outside the Golden Horde territory. In manor houses of Russian towns only secular glass vessels such as vials and bowls were found. Islamic lamps were not exported outside Volga Bulgaria. In connection to this Mikhail B. Piotrovskii noted that cultural contacts and the proximity of the culture of aristocrats from both the Islamic and the Christian worlds deserve special attention. In his opinion 'this problem of cultural unity is above confessional, national and political difference and is relevant today in scientific and public sense' (Piotrovskii 2000, p. 40). Secular vessels painted with enamel and gold were mass-produced in the workshops of Egypt and Syria for the European market (Ward 1998, p. 34). In particular, Summer S. Kenesson (1998, pp. 47–48) suggests that consignments of glasses could have been produced especially for the Karaim community in Crimea. However, his conclusion that glasses of the simplest E-type only were brought to Crimea, the Caucasus, and the Southern Russian steppes has been totally disproved by the much more extensive material coming from archeological excavations in these territories.

Earlier evidence of a wider and richer assortment of Middle Eastern vessels brought to Crimea and Northern Caucasus in the 13th–14th centuries was provided by the glasses from the collection of the Museum of Islamic Art in Berlin. Acquired in the late 19th and early 20th c., this collection was brought to Germany by the head of royal vineyards in Crimea and the Caucasus on the eve of the events of 1905 (A.M. de Massonneau). In 1908, the collection was purchased by the Museum of Islamic Art in Berlin. The collection was first presented at the Museum in an

exhibition of burial furnishings from the so-called Circassian burial grounds of the Northeastern Black Sea region. Among weapons and armor items, there were glass vessels of two types, according to S.S. Kenesson, including a bottle with spherical body and high cylindrical neck (Helmeke 2010, p. 58, Fig. 6; Helmecke, Kröger 2010, pp. 158–163, nos 48–50).

More than forty years ago Natalia N. Busyatskaya studied in detail the movement of eastern artistic glass across the Crimea and down the Dneper to the territories of western Russia. Her work highlighted the concentration of finds of this kind along the part of the waterway connecting the three main trade and craft centres: Kiev, Smolensk and Novgorod (Busyatskaya 1972, p. 88). According to S.S. Kenesson (1998, p. 47), this route continued up to Poland and Sweden during the Golden Horde period. The second route went from Crimea to the North Caucasus, right up to the Volga. Chersonesus could have been one of the intermediary centres of the Middle Eastern glass production trade; enamel-painted vessels of the late 13th c. were present at archaeological sites (Kolesnikova 1973, pp. 253–254).

The Central Asian route for eastern imports of vessels with gold and enamel painting must be excluded, since no products of the kind have been found on sites in Central Asia. This fact is also reflected in museum collections and the literature on the subject (Baipakov, Doschanova 2011, p. 32). In view of this fact, it is interesting to note that researchers consider the seizure and devastation of Damascus by Timur in 1401, as well as resettlement of the craftsmen from Damascus to Timur's capital Samarkand, to be the main reasons for the disappearance of gold and enamel-painted glass products. However, S. Carboni pointed out at least two weaknesses to this theory. Firstly, the emergence of glassmaking in a new place has not been reflected in any of the written sources (and certainly not in archeological ones). Secondly, at the time enamel-painted glass was also produced in Cairo, which was not devastated by Timur. According to S. Carboni, enamel-painted glass gradually disappeared during the 15th c. as a consequence to a combination of economic, political, and artistic factors (Carboni 2001e, p. 207).

In recent decades, numerous examples of enamel- and gold-painted glass products have been discovered not only at sites on the Low and Middle Volga, but also in cities of northeastern Rus' and in Novgorod (see Valiulina 2015b, pp. 251–252). The finds expressly show the leading role of the Volga route in the import of artistic eastern glass in the 13th–15th centuries, and Bolgar was a key centre on this route.

Enamel-painted glass products are surely a bright, interesting and promising source. However, issues regarding the origin and dating of this material should first be resolved. The question of chronology is especially acute for the Eastern European material. Stratigraphic conditions of the finds and the archeological context are of primary importance in this respect, but they do not always allow for correct inferences to be made. Therefore, the materials from the Golden Horde cities, primarily the cities of the Golden Horde Bolgar, the main intermediary in the supply of Islamic glass along the Volga artery, are of the greatest importance for dating the enamel vessels from Old Russian sites, especially from the cities of northeastern Rus'. During the Golden Horde period the Volga river remained the main link connecting

the East and the West, not excepting the possibility of some western routes being used for shipping eastern products. There were no enamel- and gold-painted vessels in pre-Mongolian Volga Bulgarian cities despite the abundance of eastern imports (glazed wares, glass products and terevics), especially from the 2nd half of the 12th c. In Bolgar these products, that is, tumblers, lamps, bowls, and bottles of Egyptian and Syrian production, did not appear until the mid 13th c. They may have been delivered during the 14th c., but the upper margin date has yet to be determined. Therefore, the enamel-painted vessels in Russian cities cannot be dated earlier than the middle of the 13th c. Such vessels are themselves dating material for that time.

The medieval history of Islamic glassmaking ends in the 15th c. and the materials from eastern European sites confirm this conclusion. The latest finds of glass vessels in the Kama region are from the Toretsk site.

CONCLUSION

Extensive exploration of eastern European sites during the past decades has yielded rich collections of eastern glass, which can be analyzed to determine the main routes and stages of its transition, and understanding of the historical conditionality and regularity.

Judging by the available material, the Volga route was the main highway for middle eastern imports brought in the early Middle Ages and the pre-Mongolian period. Glassware from Iran, Syria, and Egypt streamed to the Volga region through the Transcaucasia and North Caucasus, alongside the Transcaucasian goods. Artifacts from North Caucasus sites illustrate the entire history of medieval Islamic glass.

The ancient settlement of Samosdelska, one of the key centres of oriental trade in the delta of the Volga river, is notable for its comprehensive eastern European collection of Middle East and Central Asia glass of the 11th–12th centuries.

The Volga Bulgaria state was the main market for Islamic glass in eastern Europe. Finds of eastern glass from the early formative stage of Bulgarian urban culture in the 10th–beginning of 11th centuries are few but notable: scent bottles, reference weights, inkpots, lamps. They were either personal belongings or gifts from ambassadors and merchants. Middle Eastern glass tableware and window glass gained popularity in Volga Bulgarian towns from the 2nd half of the 11th c., superseded in the 12th c. by ornaments. Bilyar became one of the centres of Islamic glassmaking, producing glass tableware and window glass.

The range of types, number and provenance of Middle Eastern glasses found on eastern European sites changed radically after the Mongol invasion in the mid 13th c. This change, was the consequence of the Mongol devastation and was in line with general trends in the history of Islamic glassmaking. Production of glassware in Bilyar was terminated; chemical vessels, that is, alembics, disappeared. The Golden Horde period is notable for the spread of Syrian and Egyptian gold- and enamel-painted vessels, as well as the gradual decline of Iranian imports. The Lower and Middle Volga regions experienced an absolute domination of glass beads, pendants

and finger-rings, which were ten times more frequent than glass tableware and other types of glassware. Golden Horde settlements produced decorations, but did not produce glass tableware. Apart from the Middle Eastern festal items, lamps and vessels, the Lower Volga settlements yielded a wide variety of everyday simple tableware of Central Asian origin. As for the Middle Volga, only single fragments of glass tableware were present in Golden Horde Bilyar (Bilyarsk III settlement), Toretsk, Old Kuibyshev, and only in Bolgar such finds were frequent. Enamel-painted vessels made up most of the finds of the kind found in Bolgar. This permits the Volga Bulgarian urban centres of the Golden Horde period to be ranked, and concretizes the beginning of the supply of gold and enamel-painted glass to the Volga region (Golden Horde Bilyar). In addition, it could be evidence of a social stratification of the urban population (e.g., in Bolgar).

From the mid 13th to the 15th centuries, Middle Eastern artistic glassware was transferred to eastern Europe through the Crimea (Busyatskaya 1972, p. 89). From Crimea it either came down the Dneper river and its tributaries to western Russian territories or, and especially intensively, through the territory of Golden Horde state to the northern Caucasus and the Volga region.

At that time glass vessels – flasks, and gold- and enamel painted glasses – were widespread not only in the Golden Horde and north Caucasus burial grounds, but also in all the big cities of Rus', that is, Novgorod, Turov, Vladimir, Suzdal, Ryazan, Tver, Yaroslavl, Moscow, Nizhny Novgorod, Smolensk and others, being an integral part of the life of Russian aristocrats. The highest concentration of Middle Eastern glass vessels was in the northeastern regions of Rus'. Islamic glass was brought to this region via the Volga route through Bolgar in the 2nd half of the 13th and 1st half of the 14th c.

East European Orientalism of the mid 13th–15th centuries differed fundamentally from western Orientalism owing to the large-scale adoption of Eastern elements by Russian material culture (textiles, glazed tableware, artistic metalwork, weapons, etc). Eastern motifs in Russian architecture and the arts reflect the process of the formation of culture of a united Eurasian Russian state. Islamic glass objects found on eastern European sites are yet another illustration of this process.

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ABBREVIATIONS

- AKU — University Archaeological Collection, Archaeological Museum of KFU (Kazan)
 B — room number in the Bulgarian State Historical and Architectural Museum-Reserve in Bolgar (excavations in Bolgar).

- BM — Bilyar Museum (Bilyarsk).
 BSHAMR — Bulgarian State Historical and Architectural Museum-Reserve (Bolgar).
 CXCVI — room number in the Bulgarian State Historical and Architectural Museum-Reserve in Bolgar (excavations in Bolgar).
 CXCIX — room number in the Bulgarian State Historical and Architectural Museum-Reserve in Bolgar (excavations in Bolgar).
 NMTR — National Museum of the Tatarstan Republic (Kazan).
 SHM — State Historical Museum (Moscow).
 SEM — Scanning Electron Microscopy.

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