

Article

Iranian Glazed Ceramics of the 12th—Beginning of the 13th Centuries in the Volga Bulgaria

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Abstract: This article is devoted to the analysis of Iranian art ceramics from the monuments of the Volga Bulgaria of the 12th to early 13th centuries. As a historical source, glazed ceramics have great opportunities in determining the directions of trade and cultural links, as well as priorities of inter-cultural interaction. It is especially important that the materials under consideration were obtained as a result of excavations, which means that they are stratified and provided with an archaeological context. Iranian ceramics are represented by fritware luster, mina'i, and pierced decoration. The study was carried out using morphological and stylistic methods and scanning electron microscopy method (SEM-EDS). Based on the results of the work, the technological characteristics of glazed ceramics, the stability of the craft tradition, and some changes in recipes within the same morphological group have been determined. The dynamics and chronology of the import flow from Iran to the Middle Volga are established, which revealed correspondence to the main stages of urban culture development of the Volga Bulgaria.



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1. Introduction

In the Middle Ages, the mainly eastern direction of the Middle Volga Region contacts was the mainly the result of geographical location and cultural and historical factors (Figure 1). The Volga–Baltic trade route played a decisive role in the formation of the Volga Bulgaria state (middle course of the Volga river, Russia), which adopted Islam in the early 10th century, leading to the gradual formation of an Islamic urban state culture. Artistic ceramics and glass of the East not only show the trade directions and cultural links of the Volga Bulgaria, but also let us trace the dynamics of the state and culture development via analysis of imported materials, and define and differentiate the main stages of this process.

The most numerous evidence of trade contacts of the Middle Volga with the Middle East in the 9th–10th centuries were Arab dirhams and glass beads, which were another international currency in the unfair fur trade of the Middle Ages [1,2].

Another level of international connection is evident from appearance of new type of Middle-Eastern glass products in 10th century Bolgar and Suvar, which were previously unknown in eastern Europe. These include a few findings of glass perfume bottles, standard weights for gold coins, and inkwells in early Bulgarian cities [3–5]. The small number of these types of products found is evidence that they came to the Middle Volga Region, not as imported goods, but as personal possessions or gifts from ambassadors and foreign merchants. Not being the objects of regular trade at the time, the aforementioned items, however, show the depth and serious plans for not only commerce, but also plans for wide intercultural interaction in the future. Moreover, glass products of that time were not found together with glazed pottery. It is also important to point out that there was no corresponding ceramic ware trade in Middle Volga region at that time.

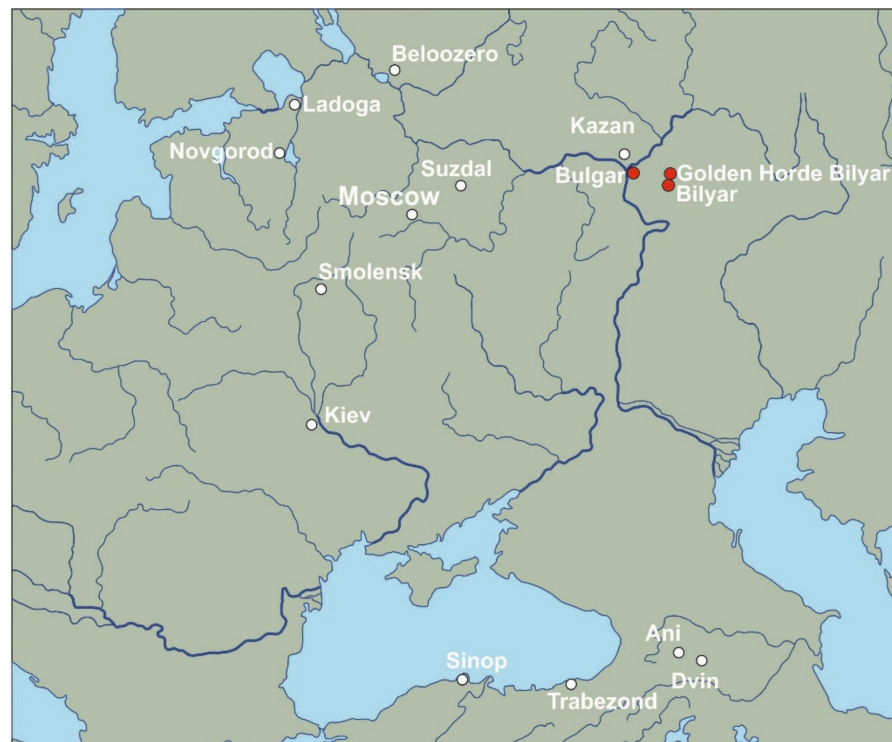


Figure 1. Bilyar, Golden Horde Bilyar, and Bolgar location city map.

The aforementioned information, given the context of other eastern imports to Middle Volga at that time (monetary silver, Samanid dirhams, glass beads), allows us to conclude that, during the 10th century, the urban Muslim culture had not yet formed, and neither had the population strata that would require and could afford such non-essential and yet fragile and expensive imported goods [3–5].

Further development of cultural and economic links with the East changes the character and geography of import: 11th century archeological evidence shows regular import of ceramic glazed pottery and glass products into Volga Bulgaria. Specifically, these two categories of Middle Eastern and Central Asian ware were found in Bulgarian cities and princely residences, but the most expressive products were found in the new capital—Bilyar (Figure 1). Separate finds of glass vessels' fragments decorated with carvings and massive pallets of early Islamic lamps were accompanied by finds of glazed bowls of the "Sari" type from art workshops of northeastern Iran (Khorasan and Maverannachr) [6] (p. 73). Fragments of such vessels, or similar, sometimes called "Karakhanid", are known in Suvar, Bulgar in Tatarstan and in the Muromski town in Samara region [7].

While determining the origin and travel routes of early glass vessels, it should be mentioned that these findings are accompanied by contemporary Middle Eastern art ceramics. Both categories (glass and ceremonial ceramics) mutually supplement and confirm the dating of the finds and status level of these items. This correlation is utilized and relied on in numerous scientific studies [4] (p. 238), [8] (pp. 284–285), [9–11]. Since the 11th century, Iranian glazed ceramics and glassware were especially expressive and noticeable among the things imported to Bulgarian cities from the East and, moreover, the volume and variety of these imported items were constantly growing. During the period from the 12th century to the first third of the 13th century, there was the peak inflow of imported eastern ceramic and glass to pre-Mongolian Bilyar from Iran, Syria, Egypt, Central Asia, and the Caucasus. The most numerous in this collection are Iranian works of art from the end of the 12th century to the beginning of the 13th century, primarily fritware luster-painted vessels (Figure 2a–e).



Figure 2. Fragments Iranian glazed ceramics from to pre-Mongolian Bilyar: (a–e) luster painted; (f,g) mina'i.

The upper horizon of the cultural layer of the pre-Mongolian Bilyar ends with a coal ash layer with ruins of buildings and the bones of animals and unburied people—residents and defenders of the city from the Mongol invasion of 1236. The city was captured and destroyed; the surviving inhabitants were not even allowed to bury the dead. The city of Bolgar also experienced the Mongol ravage, but, unlike Bilyar, it was rebuilt and became the main city of the Bulgarian ulus within the state of the Golden Horde.

However, let us come back to pre-Mongol Bilyar, namely to its ruins. At a distance of 1.5 km north of the destroyed city, the conquerors founded their own city, the purpose of which was to maintain obedience of the population in the district and fulfill fiscal functions. The new city, the Golden Horde Bilyar (Figure 1), one of the earliest Mongolian cities in eastern Europe at the end of the 13th century, minted coins—the “Bilyar coin”—and existed as a city only for a short time, until the early 14th century.

2. Materials and Methods

The article examines materials obtained as a result of the author's excavations in the central part of the Inner City of Bilyar (Figure 1) of two industrial complexes: a pottery workshop for the production of glazed ceramics, excavation 40 [12,13], and the workshop of an alchemist, jeweler and glassmaker, excavation 41 [14].

Both objects are part of the khan's craft system, stratified and provided with a rich context, dated to the late 12th to early 13th centuries. All finds of an Iranian chandelier were taken from these collections—5 specimens, and 2 specimens of mina'i (Figure 2). A fragment of a mina'i was an accidental find on arable land in the excavation area (Figure 2f). It should be noted that more than 100 items with luster painting were obtained for all the years of excavations in Bilyar, but there are only 7 fragments of mina'i.

From another area of Bilyar (head of the excavation A. Kh. Khalikov), comes a pierced bowl with embossed decor. This bowl was previously analyzed, and the analysis was published [15] (Table 1: 1, 1a) in order to compare with fragments of a vessel made in a similar technique from the boundary horizon of the pre-Mongolian and Golden Horde layers of Bolgar (Figure 1), reflecting the “moment” of the Mongol conquest of the city (excavations by N. Trubnikova [16]) (p. 27).

The third source of samples was the Golden Horde Bilyar—a Mongolian city that arose no later than the middle of the 13th century (the author's excavations in 1994–1998). The sample included all vessels that were identified as Iranian by morphological features: with the exception of very small fragments, only 2 vessels with luster painting and 2 with a

blue transparent glaze and underglaze relief; one of them is a “rosewater bowl” (bowl of gulabdan). Thus, this article discusses 13 samples of vessels.

In order to obtain technological characteristics and confirm the attribution of glazed ceramics (8 samples), the chemical composition of glaze, clay, and fritware was determined by scanning electron microscopy (SEM-EDS) method using Carl Zeiss EVO 50 with an X-ray micro-analyzer (Bruker EDS). The analysis was carried out at accelerating voltages of 20 kV in order to increase the sensitivity to such elements as Pb, Sn, Sb, As, and Ba. The current mode ranged from 5 to 12 nA for a better ratio of locality vs. analysis speed. Microscope imaging mode implies backscattered electrons (BSE). This mode allows us to distinguish the phase composition in the samples (layers, inclusions) most accurately.

The data on quantitative and qualitative analysis are presented as oxides (Table 1). To process the experimental data and determine the composition directly during the measurements, we used a calculation algorithm based on the scheme of ZAF models, which takes into account corrections for the arising effects of generation and absorption of characteristic X-ray radiation, as well as for fluorescence from characteristic X-ray radiation or the bremsstrahlung. Detection limit was 0.01–0.5.

Table 1. Results of the chemical composition analysis of the glaze by SEM-EDS (w%).

Analyzes 1, 5, Were Previously Published [11].																		
Nº	Name	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	CaO	Fe ₂ O ₃	SnO ₂	PbO	P ₂ O ₅	SO ₃	K ₂ O	TiO ₂	CoO	CuO	ZnO	Other	
a	Bowl with pierced. Bilyar, AKU 307/1. Colorless Glaze. Figures 3 and 4	6.35	1.87	4.27	61.01	4.04	1.17	0.00	12.73	0.16	0.00	2.92	0.36	0.00	0.39	0.00	NiO 0.13	
b	Bowl with pierced. Bolgar. B-67/754. Colorless Glaze. Figure 5	16.94	3.17	1.45	68.73	4.85	0.88	0.00	0.40	0.30	0.39	2.36	0.11	0.00	0.27	0.00	MnO 0.02	
c	Fragment. Bilyar. AKU-285/1289. Blue Glaze.	12.18	1.45	6.57	64.29.	6.35	2.68	0.02	0.91	0.00	0.00	1.9	0.05	0.39	0.38	0.33	As ₂ O ₃ 0.02, MnO 0.09	
d	Mina'i Bilyar, 736/404. Opaque white Glaze. Figure 2f	7.04	3.23	2.46	56.04	5.27	3.80	4.87	12.86	0.41	0.25	1.99	0.02	0.18	0.57	0.07	BaO 0.28, Cr ₂ O ₃ 0.25, SrO 0.23, MnO 0.01	
e	Mina'i. Bilyar, AKU 285/4592.Opaque white Glaze. Figure 2g; Figure 6a	8.11	1.72	2.38	63.40	3.49	1.08	4.08	12.61	0.11	0.12	2.21	0.22	0.00	0.20	0.00	NiO 0.09	
f	Fragment lusterware Golden Horde Bilyar. AKU335/25. Opaque white Glaze. Figure 7	12.89	1.84	2.46	51.00	3.19	0.73	8.34	17.01	0.10	0.01	1.95	0.00	0.00	0.15	0.00	BaO 0.08, Sb ₂ O ₃ 0.02, MnO 0.02	
g	Fragment. Golden Horde Bilyar. AKU335/26 Blue Glaze Figure 8	15.08	2.17	3.15	63.35	6.11	2.40	0.74	2.34	0.07	0.24	2.43	0.10	0.46	0.03	0.18	As ₂ O ₃ 0.58, Sb ₂ O ₃ 0.29, MnO 0.18	
h	Rosewater bowl Golden Horde Bilyar. AKU335/27. Blue transparent Glaze. Figure 9	8.11	1.45	4.12	62.95	8.48	5.77	0.41	0.11	0.27	0.24	5.20	0.17	0.44	0.65	0.17	Sb ₂ O ₃ 0.55, MnO 0.08	

Table 1. Cont.

Analyzes 1, 2, 5, Were Previously Published [15].																		
№	Name	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	CaO	Fe ₂ O ₃	SnO ₂	PbO	P ₂ O ₅	SO ₃	K ₂ O	TiO ₂	MnO	CoO	CuO	ZnO	Other
i	Bowl with pierced. Bilyar, AKU 307/1. Fritware. Figures 3 and 4	5.06	0.95	9.88	73.41	3.95	1.13	0.00	0.00	0.11	0.30	2.52	0.31	0.00	0.00	0.12	0.00	
j	Fragment. Bilyar. AKU-285/1289 Fritware	3.88	3.49	20.72	64.58	3.99	1.46	0.12	0.07	0.07	0.00	1.15	0.17	0.05	0.01	0.07	0.03	
k	Bowl with pierced. Bolgar. B-67/754 Fritware. Figure 5	4.02	0.69	5.1	85.67	0.84	0.92	0.00	0.08	0.11	0.26	1.84	0.23	0.01	0.00	0.01	0.00	
l	Fragment lusterware Golden Horde Bilyar. AKU335/25 Fritware. Figure 7	3.42	1.37	6.47	82.40	2.09	1.52	0.00	0.00	0.24	0.50	1.59	0.07	0.03	0.00	0.00	0.00	
m	Fragment. Golden Horde Bilyar. AKU335/26 Fritware. Figure 8	3.96	1.18	6.91	79.14	3.12	2.03	0.00	0.00	0.09	0.19	2.17	0.15	0.04	0.00	0.00	0.00	

3. Results

Eight samples represent two types of glazes: alkaline (Table 1: b, c, g, h) and alkaline lead (Table 1: a, d, e, f). Both types are fired on plant ash—halophytes of the arid climate zone, the composition is characterized by significant fluctuations in the concentration of MgO from 1.45% to 3.23% and K₂O from 1.90% to 5.20%. The ratio of alkali oxides Na₂O/K₂O is from 1.56 (Table 1: h) to 7.17 (Table 1: b). These indicators are consistent with the results of the analysis of the ashes from Syria, Iraq, Iran, Pakistan, Afghanistan, and Uzbekistan, in which the Na₂O/K₂O ratios vary between 1.2 and 9.2 [17] (p. 1289), that is, they demonstrate a wide variability of values, but at the same time they are consistent with the ratios of Iranian glazes [18] (pp. 83–88, Table 13). The choice of the type of glaze in each case was subordinated to the general decorative concept.

Three transparent glazes with cobalt 0.39–0.46% from the Golden Horde Bilyar are alkaline (Table 1: c, g, h). These samples contain zinc impurity (0.17–0.33%), which is obviously due to cobalt raw materials. Among the group of alkaline glazes, the “rose water bowl” glaze occupies a special place (Table 1: h). The sample has the highest concentration of potassium oxide, 5.20%, and the lowest value of the Na₂O / K₂O ratio, 1.56. In Islamic glass production, glasses from Central Asia have a high content of potassium oxide, which is associated with the geochemical characteristics of the soil and the physiology of plants growing in this region [19] (pp. 423, 432).

The surface of the Golden Horde Bilyar “rosewater bowl” was covered with alkaline glaze with high content of potassium and calcium compounds, a large amount of dye—cobalt oxide—with a big concentration of zinc, indicating the Iranian origin of cobalt raw materials (Table 1: h). One of the probable places of extraction of the minerals that were used in the Middle Ages is considered to be the neighborhood of Tabriz [20] (p. 374). Currently, other deposits of cobalt minerals are known on the territory of Iran and Central Asia, where positive correlation of cobalt and zinc was found [21] (p. 120), [22] (p. 37), [20,23]. Often, polymetallic ores, in addition to cobalt and zinc, contain iron, chromium, nickel, manganese, etc. in different concentrations. However, it must be noted that any cobalt pigment containing significant traces of Zn, Cu, or Ni could acquire them during processing of the pigment—e.g., grinding in a brass mortar could subsequently leave such traces [24] (p. 744).

In our sample, two vessels from Bilyar (Figures 3 and 4) and Bolgar (Figure 5), judging by their morphological features, represent one type of vessel with an underglaze relief, pierced along the image contour, and inclusions of cobalt under transparent, almost colorless glaze (with a slight greenish tinge in a thick layer due to the presence of copper oxide). However, the glazes of these vessels are of different chemical types.

The different glaze composition of these two vessels was proven by the analysis to be important. The glaze of the bowl from Bolgar is of the alkaline chemical type—Na₂O-K₂O-CaO-MgO-Al₂O₃-SiO₂ (Table 1: b). The main difference from the second type is the almost complete absence of lead oxide—only 0.40%—and a different ratio of magnesium and aluminum oxides. The fritware of the two related products also differs in the concentration of three oxides, Si, Al, and Ca (Table 1: c, e), which testifies different sources of silica raw materials and suggests that the bowl from Bilyar and the bowl from Bolgar were made in different workshops. Of course, far-reaching conclusions cannot be drawn from the analysis of the two samples, but perhaps a representative series of analysis of such products will help to find chronological differences based on technological changes.



Figure 3. Bowl fritware, pierced and embossed decorated and blue paths in Iran's transparent glaze from Bilyar [15]: (a)—decor detail, (b)—general form.



Figure 4. Graphic reconstruction of the bowl fritware, pierced and embossed decorated and blue paths (see Figure 3) in Iran's transparent glaze from Bilyar [15].

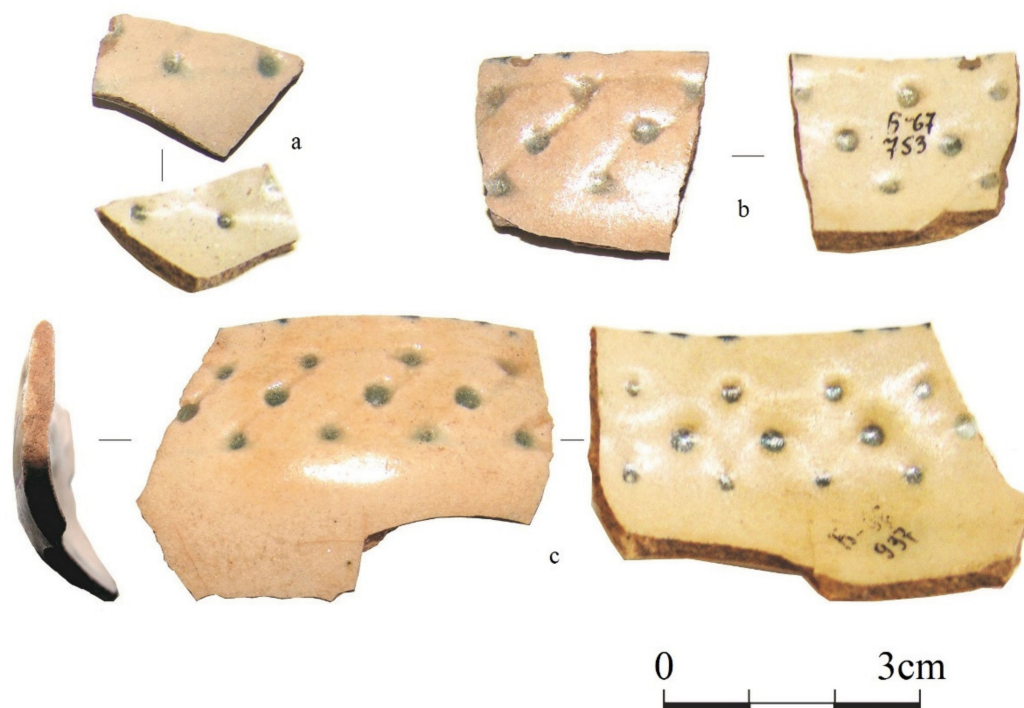


Figure 5. Fragments body frit, pierced and embossed decorated and a blue edge in Iran's transparent glaze from Bolgar.

The second type of alkaline lead glaze, in addition to the Bilyar bowl with masks, pierced and from transparent glaze (Table 1: a), is represented by three more samples. Luster-painted over-glaze bowl and mina'i traditionally contain lead-sodium alkaline-ash opaque glaze of the $\text{PbO-Na}_2\text{O-K}_2\text{O-CaO-Al}_2\text{O}_3\text{-MgO-SiO}_2$ type (Table 1: d, e, f); in our samples, we noted a concentration of lead oxide of up to 17.01% (Table 1: f) and tin from 4.08% to 8.34%. Apart from the composition of the coating glaze, colorings from a fragment of the mina'i small lid were analyzed (Figure 2g; Figure 6; Table 1: e). The fragment is painted in three colors: red, not-bright grayish-blue, and gold. The spectra on the spots of the densest gold paint showed the use of fairly pure gold, 88.47%; at the same time, a high content of nitric oxide, 11.10%, and admixture aluminum, 0.43%, were present (Figure 6c). The nitrogen compounds probably reflect the presence of organic compounds (ammonium salts) as the substance used to fix the gold leaf in the ornamental composition on the glaze surface. Researchers relying on Abu l-Qasim's treatise and the results of analyses suggest that a mixture of cedar resin and linseed oil could be such a glue [25] (p. 325). The possibility of the use of gum ammoniac as gilding mordant is also considered [26] (p. 4653).

There is higher or lower concentration of cobalt oxide in several spectra in different parts of the sample; it is a special property of cobalt coloring to diffuse in the absence of limiters. In underglaze painting with increased fusibility of cobalt paints, the so-called "dead edge" (e.g., chromium oxide), a black outline, was used. In a number of cases, engraving was applied, which plays a restrictive role during glaze melting during firing [21] (p. 122). The objective nature of the cobalt compound was clarified on the spot of the highest concentration of blue color (Figure 6b); as a result, it was determined that one of the polymetallic minerals was used as a coloring, containing a large amount of arsenic and an admixture of iron (cobaltite, erythrite, etc.) in addition to cobalt. A positive correlation between these three elements was observed in all spectra with the presence of cobalt oxide; its maximum concentration is 3.89%; arsenic oxide (As_2O_3) 7.88%, and Al_2O_3 up to 4.04% (Figure 6b). This correlation is also clearly demonstrated by the mapping of analysis results. Taking into account the activity (intensity) of cobalt coloring, even at tenths and hundredths of a percent [22] (p. 37), its amount in our sample is surprising, especially due to the fact that the blue color is not bright and has a strong gray tint (Figures 2g and 6a).

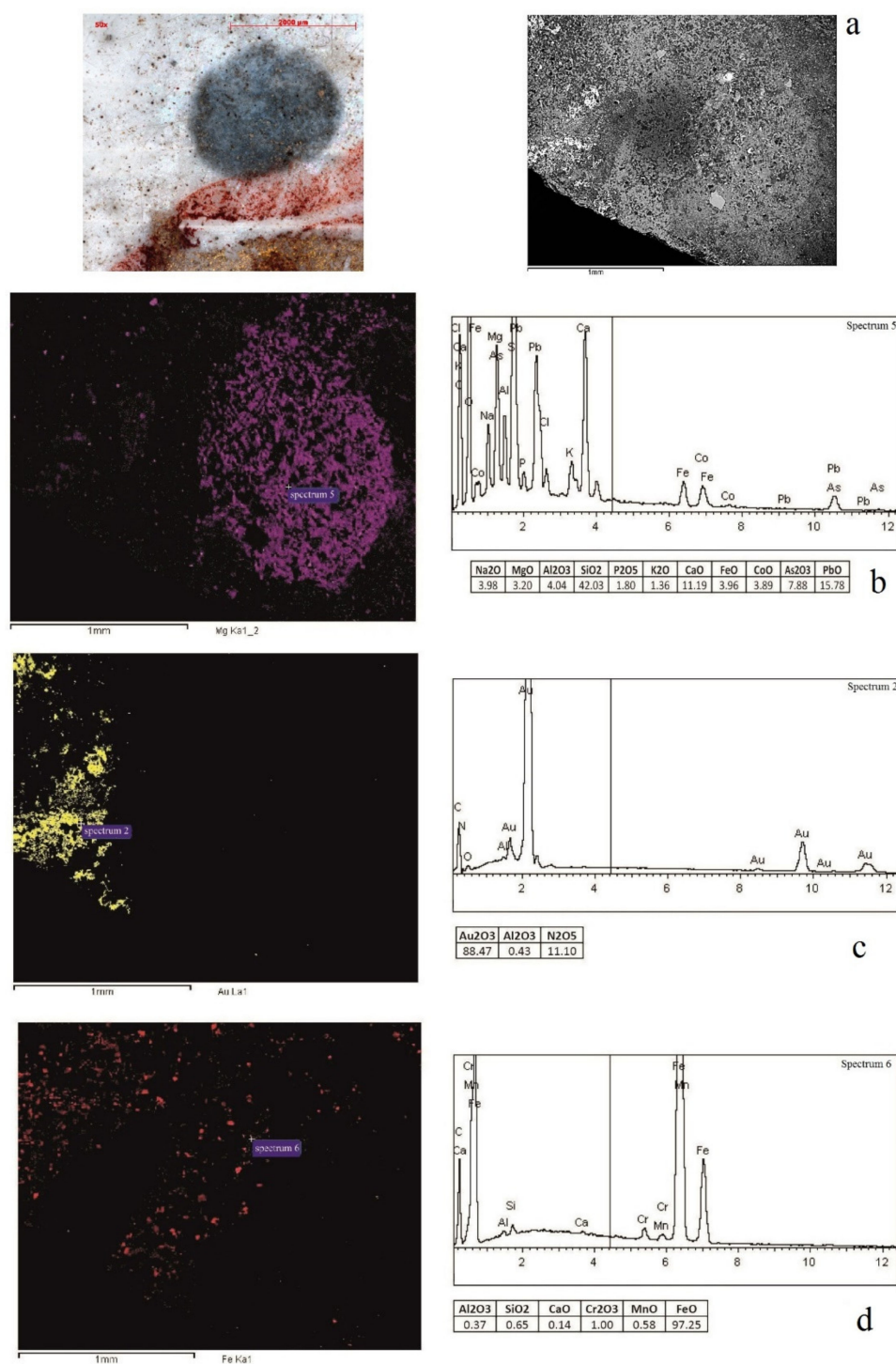


Figure 6. Electronic mapping of the analysis results (SEM-EDS) of glaze and enamel pigments of the mina'i from Bilyar (Figure 2g): (a)—macrophoto of the analysis area (Table 1: f); (b)—analysis of blue enamel pigment, (c)—gold analysis, and (d)—analysis red enamel pigment.

The red color was obtained using hematite; the point spectrum showed its high concentration— Fe_2O_3 —97.25%, while the presence of Cr_2O_3 in the amount of 1.0% could not have a significant effect (Figure 6d). There are well-known deposits of cobalt chromites and minerals in Isfahan and Shahriar, in Tabriz, and in other regions of Iran [25] (p. 324).

The composition of fritware of all vessels is characterized by highly silica raw materials— SiO_2 varies from 64.58% to 85.67%, with the most significant admixture of Al_2O_3 from to 20.72% (Table 1: i, j, k, l).

4. Discussion

Below, we will discuss some of the sample from a collection of more than 100 items, obtained as a result of our excavations in the center of pre-Mongolian Bilyar.

A fragment of afritware vessel with a luster decoration on opaque glaze obviously belongs to a closed vessel of the jug or albarello type. The surface of the vessel was coated with a luster grid, forming slightly convex luster-painted cells (Figure 2b). Such vessels are related to the Kashan production of Iran of the early 13th century [27] (p. 114, No 138); [28] (p. 182, Cat.108 g). Three jugs with similar decorative techniques were found in Armenia in Arapan settlement and in Dvin of the 12–13th centuries [9] (p. 25, table LII); [29] (p. 128, pl. XLII, XXXVI). Finds of this kind are rather rare in Bilyar. In contrast, more common are fragments of the vessels with mostly closed form, with luster decoration on opaque glaze on the outside, and cobalt liquid glaze on the inside (Figure 2e). Obviously, the internal glaze did not play an aesthetic role, but was intended to fulfill a technical function in pharmacy vessels. A fragment of this type of special vessel from an alchemist's workshop could be a part of a small bottle with horizontally corrugated surface and rich olive-color luster decoration, which was also painted horizontally. The inner surface was covered with a thin layer of blue cobalt glaze, which was damaged by fire (Figure 2e). A similar combination of decoration techniques is known in Iranian pottery during 1170–1220; cobalt coating could vary depending on the shape of the vessel [30] (pp. 349–351, cat. 0.4, 05, 07). The shape of the sample has glass analogues attributed as Iranian products [31] (p. 35, Figure 8: 1).

Usually, heavy plates' bases are preserved best in the cultural layers; one such sample is the base and a part of the bottom of a wide bowl, which retained the central part of the luster-painted composition inside. It is based on a cross-shaped design, in which a four-petal flower with a fringed edge of petals is painted (Figure 2d). The ornamental composition with a cross-shaped rosette in the center is often seen in vessels adorned with luster [27] (p. 120, No 146), [32] (p. 229, Table XI, 3) or with other decorations during the period from the 9th century—the late Middle Ages. The image at the bottom of a dish with polychrome design and an epigraphic date of 1216 made in Kashan from the Louvre [33] (p. 148, Figure 98) collection appears to be the closest analogue to the drawing on the Bilyar bowl.

The pre-Mongolian Bilyar collection contains seven fragments of vessels decorated in the mina'i technique, found in the upper horizon of the cultural layer of the late 12th to the first third of the 13th centuries. The most expressive is a fragment of the bottom of a small bowl on a ring base (Figure 2f). The inside surface of the bowl is a painted five-color composition: black, terracotta-red, blue, turquoise, and gold. The surviving fragment represents a part of the central composition. A moon-faced person is depicted at the bottom of the bowl, embodying a canonical Turkic type of beauty with finely defined facial features: big almond-shaped eyes, thin arches of eyebrows converging at the nose bridge, a straight nose with a slightly lowered tip, a small mouth. Black hair, finely contoured with gold, descends on shoulders as separate strands or braids. The head is surrounded by a halo. There is a profile of a bird with an elongated neck to the right of the figure. The whole fragment is painted rather densely, even the background above the bird is densely filled with random strokes, possibly images of clouds. There was nothing painted on the outside surface. This find is a classic mina'i sample, which has numerous analogues.

Another find that deserves attention is a part of a miniature vessel lid found in the alchemist's workshop in the center of Bilyar [14] (Figure 20: 3). The concentric floral ornament is painted in three colors: blue-gray, red, and gold. We are not aware of any analogues to the lid, but the color scheme is similar to the fragment from the collection of the Galouste Gulbenkian Museum in Lisbon [34] (p. 62, cat. 87) and the mina'i from

Merv [35] (Figure 5). Most of the other mina'i finds are represented by small fragments of little information.

The pearl of the entire collection of pre-Mongolian Bilyar's ceremonial Middle Eastern ware is undoubtedly the fritware bowl (Figures 3 and 4) with embossed female faces and pierced decoration under transparent glaze [15] (pp. 91–106, Figure 2, 16), [36]. The bowl with unique decorative composition belongs to the group of vessels of especially sophisticated technology, which also includes bowls and jugs [27] (p. 97. No 101–103), [37] (pp. 88, 175) with colorless (less often—blue) cobalt covering glaze [36] (p. 93), green and turquoise glaze [38] (p. 58, No 35–36), with imprints of faces [27] (p. 98. No 105), as on the pre-Mongolian Bilyar bowl; this is reminiscent of a scene of aristocracy hunting on the bowl from the Louvre [39] (pp. 157–159, Figure 101), with simple punctures without relief [30] (pp. 310, 320–321, cat. L.7, cat.L. 21), [37] (pp. 84, 174), [38] (p. 58, no 34), with embossed inscription [37] (pp. 79, 174), [29] (p. 181, cat. 108d), with stylized vegetal design [30] (cat. 1.9), [37] (pp. 89, 90, 175; [40] (p. 90, cat. No 50), or a raised braid on the edge [37] (pp. 91, 93, 175). The bowl was found in the center of the pre-Mongolian Bilyar in the upper horizon of the cultural layer of the late 12th to the first third of the 13th centuries; several fragments of pierced fritware were found within the city on different objects of this layer. Thus, the stratigraphic conditions of the Bilyar finds correspond to the general dating of this group of Iranian fritware of the late 12th to early 13th centuries, produced in the city of Kashan.

Four fragments of the same fritware vessel were found in the center of Bolgar during the excavations of 1967 in one of the earliest constructions of the Golden Horde time—the level of the construction falls on the border of the pre-Mongol and early Golden Horde layer [16] (p. 27). The bowl to which these four fragments belonged to had a blue-cobalt edge and a wide raised braid under it; the braid weave angles are accentuated by though pierced holes under a transparent colorless glaze (greenish in a thick layer—CuO—0.27%) (Figure 5; Table 1: b. Bowls or vases on a high ring base—foot—had a similar design [37] (pp. 91, 93, 175). The results of the analysis of the vessel's glaze and fritware allowed us to determine differences in production technology and chemical composition between samples from Bolgar and the Bilyar bowl adorned with faces (Table 1: a, c, i).

The finds of Iranian luster-painted ware of the Kashan type are of fundamental importance to dating the new city—the Golden Horde Bilyar [41] (pp. 379–412). According to Robert Mason, a fragment of a fritware vessel—a luster-painted bowl, in which vertical luster chains of brackets' pairs in the lower part of the vessel are especially noteworthy—is a “brackets-lines” motif [42] (p. 116, Figure 5). The bowl has a strict geometry in its form: straight lines diverging upward were refracted by a horizontal edge in the lower part of the body that touches the ring base. A fragment from the Bilyarsk settlement III, Golden Horde Bilyar preserved this structural element, allowing us to make a graphic reconstruction of the bowl (Figure 7).

Mason, analyzing the shape of such vessels, believes that it was dictated by two cones, and the combination of two signs—the ornamental motive and the form—allows us to date the luster-painted vessels with row-lines of brackets, produced in Kashan, to the beginning of the 13th century [42] (p. 116, Figure 4). This attribution is confirmed by many well-known analogues, such as a bowl in the collection of the Museum of Islamic Art in Berlin (Inv.-Nr1.1996.2), a signature bowl made in Kashan in 1215, a jug of the first third of the 13th century, stored in the Louvre [43] (pp. 196–198), the bowl dated 1200–1220 from the Kuwait National Museum [30] (p. 359, cat. 0.17), and vessels of the early 13th century from the collection of the Tareq Rajab Museum [27] (p. 121, No 148; 123 No 150). Similar luster decoration could be found on earlier ware—bowls and jugs with rounded walls of the late 12th to early 13th centuries [38] (p. 74, No 56; 78, No 63), [40] (p. 139, No 91). However, Oliver Watson unites both vessels into one group and dates them to the same time: 1200–1220 [30] (pp. 359–360, cat. 0.17, 0.18). Vessels of the albarello type of wide vertical luster stripes have a wider period of existence—from 1170 to 1220 [30] (p. 361, cat.

020), [37] (p. 106); fragments of such a vessel were found at Excavation V Site of the Golden Horde Bilyar (Figure 8).

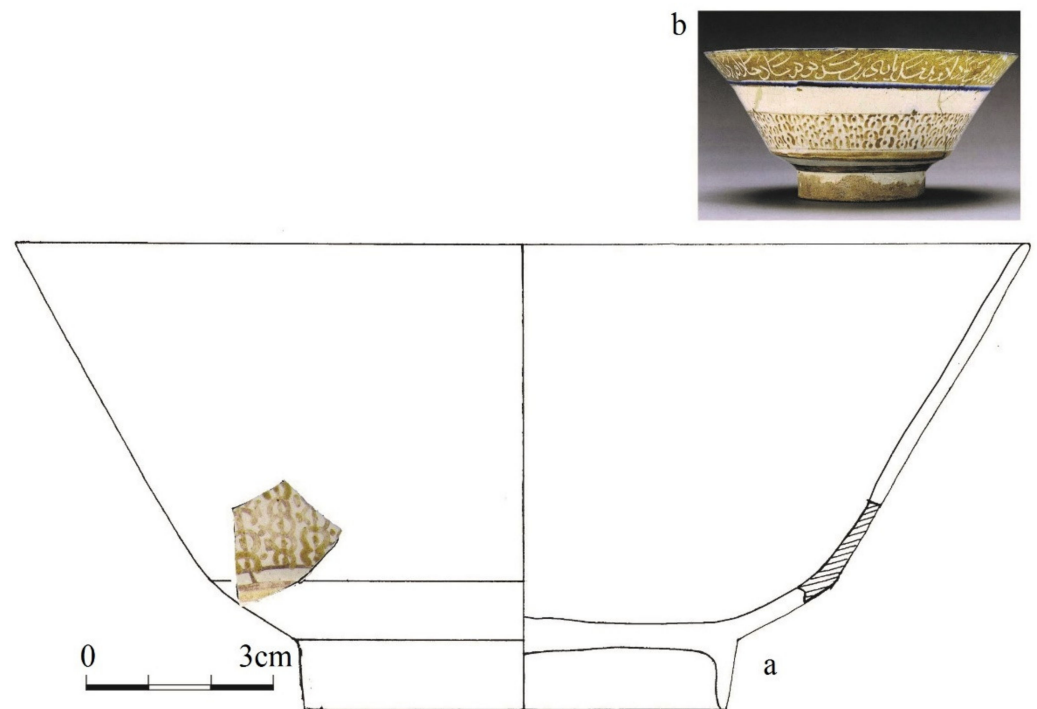


Figure 7. Reconstruction of a body luster painted from the Golden Horde Bilyar (a) and its analogy (b) from Kuwait National Museum [30].



Figure 8. Fragments of a body with a luster painting the Golden Horde Bilyar (a,b) and its analogy from Kuwait National Museum (c) [30].

Finds of samples of the Iranian lusterware produced in Kashan at the beginning of the 13th century provide an opportunity to suggest that the Golden Horde Bilyar was founded immediately after the Mongol conquest of 1236. It should be mentioned that there are no vessels of similar types of decoration in pre-Mongol Bilyar and Bolgar. The Golden Horde Bilyar is the only city in the Volga region that possessed unique artworks of the Iranian Kashan of the first third of the 13th century. Most fragments of luster-painted vessels from the Bolgar collection belong to the later versions of Iranian lusterware of the Ilkhanid period from the second half of the 13th to the first half of the 14th centuries [44] (p. 75).

Small fragments of the Ilkhanid lusterware come from Construction 1 of Excavation Site III in the Golden Horde Bilyar.

An example of another type of fritware is a “rosewater bowl” with turquoise glaze inside and ultramarine glaze outside, which has been almost completely restored (Figure 9). Vessels of the “rosewater bowl” type were widely used in the Golden Horde, becoming a kind of hallmark of the culture of this state.



Figure 9. Body “rosewater bowl” the Golden Horde Bilyar.

The find from the city that appeared immediately after 1236 and did not exist after the beginning of the 14th century provides opportunities to start the search for the source of these vessels. In shape, it is a large vessel on a ring base with a wide convex body and a low bell-shaped neck. The diameter of the rim is 19 cm, the height of the rim is 1.8 cm, the largest diameter of the body is 26 cm, the height of the vessel is 15.5 cm, the diameter of the ring base is 11 cm, the height of the ring base is 2 cm, and the thickness of the crock is 0.6–0.7 cm. The vessel, similar to its closest analogues, was made in a wide vase form. A characteristic detail of the vessels for rose water are cone-shaped bumps; three of them have been preserved. The outside surface of the “rosewater bowl” is also decorated with embossed horizontal lines. There is a stamped epigraphic ornament in the upper part of the vessel—the repeated Arabic word “ikbal” (success), complemented by decorative dots. The lower part of the vessel is decorated with 36 elongated relief festoons. All decor elements are made with under-glaze painting engobe. Vases with a wide convex body and embossed conical elements on the outside surface are found on the medieval monuments of Iran, Central Asia, the Golden Horde, and Russia [45] (p. 197), [46] (pp. 191, 207, 211), [47] (pp. 70–71, Figure 10:1, Figure 32: 1,2, Figure 37: 3), [48,49] (p. 105, Figure 10).

The fritware and the glaze coating of “rosewater bowl” are similar to the frit and glaze of an Iranian vessel of the albarello type from Excavation Site XXXVIII in pre-Mongol Bilyar, as well as the composition of the samples (Table 1: c, g, h). Iranian glazed vessels of the 12th–13th centuries, especially with cobalt coating glaze, have a peculiar decorative detail: thick glaze generously covers the outside surface of the vessel without reaching the ring base, and hangs over it as heavy drops [27] (p. 100, No 108,109; p. 106, No 122; p. 108, No 126). The “rosewater bowl” of the Golden Horde Bilyar is also characterized by a similar artistic device (Figure 9).

The origins of vessels of a similar shape, apparently, should be sought in Iran. Geza Fehervari published a photo of a small open vessel on a ring base with three embossed curly plaster and a short spout, covered with a transparent light-green glaze on the outside and yellow-green glaze inside. The author reports the findings of such vessels (a signature vessel is among them) in Iran (Nishapur), Syria, Afghanistan, and Central Asia of the 12th–13th centuries, and supposes that they had been produced for a short period of time after the Mongol invasion [38] (pp. 84–85, No 86). The earliest examples of vessels with bump-like elements in the Middle Volga region are the finds from Bolgar: a fragment of the luster-painted fritware with a bump-like element [44] (p. 74) and a fragment of the vessel is made of light-red clay with yellow-green double-sided glaze (BGIAZ 1009-779/270).

Considering that our “rosewater bowl” was discovered during excavations of the Golden Horde Bilyar in an object of the second half of the 13th century, when there was still no reason to speak of own Golden Horde production, this vessel was definitely imported, possibly from Central Asia or northeastern Iran.

5. Conclusions

Glazed ceramics played a special role in choosing the direction of economic relations and cultural links. In the cities of the Volga Bulgaria of the 11th to the beginning of the 13th centuries (first of all in Bilyar), Iranian ceramics were especially expressive. Taking into account stratigraphy and the archaeological context, in which the Middle East glass was the most significant accompanying material, the collection of Iranian imported ceramics allows us to trace the dynamics of intercultural interaction and highlight on its basis the main stages of the Bulgarian urban culture development during the 11th to the first third of the 13th centuries.

Samples of Iranian glazed ware, together with other imported things from the East, let us distinguish three main stages of this process:

1. The first stage corresponds to the 10th century—the time of the initial appearance of the Volga Bulgaria state, the highest and last rise in silver and fur trade along the Volga Baltic way. Islam was adopted, but did not fortify its positions. Cities were established only as intermediary shopping centers. Import of art products, including glazed tableware, was practically absent.

2. The second stage falls on the 11th century. At that time, according to all sources, the funeral ritual first of all, Islam fortified its positions all over the territory of Volga Bulgaria; it was a period of active urban construction and the development of urban Islamic culture. In those conditions, works of the eastern artistic craft, including glazed ceramics, became popular. The most vivid examples are the Iraqi luster-painted bowl, Iranian Sari-ceramics, and Karakhanid ceramics of Central Asia.

3. The most impressive time in the history of Volga Bulgaria is rightfully the 12th to the first third of the 13th centuries. That was the time of the highest rise of state culture in all its manifestations. The collection of oriental art ceramics in the pre-Mongolian Bilyar alone included more than 300 samples. Iranian glazed ware was presented by fritware luster-painted vessels of monumental and miniature style, with carved and engraved patterns, pierced decoration, mina'i, and others.

The use of Iranian artistic ceramics by different social layers of the urban population, including artisans, is important for a general assessment of cultural ties of the pre-Mongol Bilyar of the 12th to the first third of the 13th centuries with Iran and the level of the urban culture development.

Two types of Iranian vessels with luster painting, provided with reliable analogies in published works, which had been produced until the first quarter of the 13th century (Figures 7 and 8), confirmed and specified the time of foundation of the Golden Horde Bilyar in the 13th to the early 14th century—one of the earliest Mongolian cities in eastern Europe.

The “rosewater bowl” belonged to the same city (Figure 9). This type of tableware became widespread in the Golden Horde from Khorezm to Transnistria and can rightfully

be considered a hallmark of the culture of this state. However, the production of artistic ceramics in the cities of the Golden Horde developed in the 14th century. The discovery of the rosewater bowl in the Golden Horde Bilyar of the 13th to early 14th century, the results of the analysis, and documented analogies, let us presume that the vessel is of Central Asian or north Iranian origin.

Archeometric studies have contributed to a more reliable attribution of products, obtaining information about manufacturing technology and the nature of raw materials. The analysis of a small analytical sample showed that, despite the different styles and techniques of decoration, the composition of fritware—high-silica with a significant admixture of alumina—is constant as a whole in accordance with the sustainable craft tradition and raw materials of the region. Using the example of a beautiful Bilyar bowl with pierced decoration (Figures 3 and 4) and fragments of a bowl made using a similar technique from the Early Golden Horde Bolgar (Figure 5), it is tempting to explain some deviations in the glaze and fritware recipes due to a change in tradition at a turning point in history, but these data must be confirmed by analysis of additional samples.

Applying these techniques to imported art glassware, we can not only reconstruct the trends of cultural and economic relations of the Volga Bulgaria, their system, character, dynamics, and chronology, but also take a realistic look at the conditions, prerequisites, and the time of the start of in-house production of glazed ware. At present, such production in Volga Bulgaria is found only in pre-Mongol Bilyar, where it is provided with reliable evidence for the second half of the 12th to the first third of the 13th centuries [12,13,49].

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