Research Article

Konstantin Mikhailovich Andreev*, Alexander Alekseevich Vybornov

Ceramic Traditions in the Forest-Steppe Zone of Eastern Europe

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Abstract: Early pottery on the territory from the Eastern Caspian Sea and Aral Sea to Denmark reveals a certain typological similarity. It is represented by egg-shaped vessels with an S-shaped profile of the upper part and a pointed bottom. The vessels are not ornamented or decorated with incised lines, organized often in a net. This type of pottery was spread within hunter-gatherer ancient groups. The forest-steppe Volga region is one of the earliest centers of pottery production in Eastern Europe. The first pottery is recorded here in the last quarter of the seventh millennium BC. Its appearance is associated with the bearers of the Elshanskaya cultural tradition. The most likely source of its formation is the territory of Central Asia. Later, due to aridization, these ceramic traditions distributed further westward to the forest-steppe Don region. During the first half of the sixth millennium BC, groups associated with the bearers of the Elshanskaya cultural tradition moved westward. Significant similarities with the ceramic complexes of the Elshanskaya culture are found in materials from a number of early pottery cultures of Central Europe and the Baltic (Narva, Neman, and Ertebølle).

Keywords: ceramic tradition, Central Asia, Eastern Europe, chronology, hunter, gatherer economy

1 Introduction

The most ancient pottery in the territory from the Eastern Caspian and Aral Sea regions to the northern regions of Central Europe shows a certain typological similarity. It is characterized by vessels with an S-shaped profile and a pointed bottom. The pottery is either without ornamentation or is decorated with incised lines organized often in a net. The noted affinity between forms of the vessels suggests a certain relationship between the population of these territories. It was suggested for the first time in 1969 by the Soviet archaeologist Danilenko (1969, pp. 177–186). In the past 50 years, new ceramic assemblages and revised radiocarbon dates allowed us to put a new glance on this subject.

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* **Corresponding author: Konstantin Mikhailovich Andreev**, Department of Russian History and Archeology, Samara State University of Social Sciences and Education, Maxim Gorky St. 65/67, Samara, 443099, Russia, e-mail: konstantin_andreev_88@mail.ru

Alexander Alekseevich Vybornov: Department of Russian History and Archeology, Samara State University of Social Sciences and Education, Maxim Gorky St. 65/67, Samara, 443099, Russia, e-mail: vibornov_kin@mail.ru

1.1 Eastern Caspian and Aral Sea Regions

The earliest pottery was found at the Cave of Dzhebel site (layers 4 and 5), Uchashi 131, and a number of Lyavlyakan locations. The pottery of this region is characterized by a slightly bent rim with a pointed edge and an S-shaped profile and a pointed bottom, tempered by chamotte (Tsetlin, 2007, p. 205). The outer and inner surfaces are smoothened, and the walls are about 1 cm thick. Vessel surfaces are little decorated and covered with carved lines, less often with triangular-form small impressions (Okladnikov, 1956; Vinogradov, 1968; Vinogradov & Mamedov, 1975), organized into parallel lines, zigzags, and net (Figure 1).

Figure 1: Early pottery of the Aral Sea region, Kelteminar culture. (1 and 2) Dzhebel (after Okladnikov, 1956, p. 104, 108); (3–6) Uchashi 131 (after Vinogradov, 1981, p. 69); (7–14) Lyavlyakan sites (after Vinogradov & Mamedov, 1975, p. 32, 89, 110, 150).

Based on a series of radiocarbon dates obtained for layer 5 of the Ayakagitma settlement, this type of pottery can be dated back to 6200–6000 BC (Szymczak & Khudzhazarov, 2006, p. 26, 27) (Table 1). Very fragmented pottery sherds were found in the early layers at the Ayakagitma site that does not allow reconstructing the shape of the vessels. They are similar to the materials from the Dzhebel, Uchashi 131 sites, and the Lyavlyakan sites based on a number of technical and typological features, and belong to the early (Daryasai) stage of the Kelteminar culture. It should be noted that very few radiocarbon dates have been obtained for the early Neolithic of the Central Asian region which lead to assume that it is even more older in age.

For the early Neolithic of this region, hunter-gatherer economy dominated. There is no data for the existence of a productive economy, the basis of life support was hunting and gathering. Bones of domesticated animals were identified only at Ayakagitma site (Szymczak & Khudzhazarov, 2006, pp. 206–217).

Table 1: Radiocarbon dates for some of the sites regarded in this article

Site	Lab. no	14C age (BP)	14C age (BC)	Dated material	References
Aral sea region, Kelteminar culture					
Ayakagitma	Gif/LSM-11205	7190 ± 20	6077–6010	Charcoal	Szymczak & Khudzhazarov, 2006, p. 26
Ayakagitma	Gif/LSM-11103	7120 ± 20	6061–5921	Charcoal	>>
Ayakagitma	Gif-11207/GifA-99183	7100 ± 90	6092–5751	Charcoal	>>
Ayakagitma	Gif/LSM-11102	6960 ± 15	5895–5751	Charcoal	>>
Forest-steppe Volga region, Elshanskaya culture					
Chekalino IV	Poz-42051	7250 ± 60	6233–6011	Carbon pottery	Vybornov et al., 2017, p. 226, 227
Chekalino IV	SPb-1731	7127 ± 150	6263–5720	Pottery	>>
Vjunovo lake I	AA-96017.1	7222 ± 58	6222–5995	Pottery	>>
Vjunovo lake I	Poz-47870	7160 ± 40	6079–5981	Pottery	>>
Imerka VII	Hela-3521	7205 ± 60	6224–5984	Food crust	>>
Upper and Middle Don, Karamyshevskaya culture					
Ivnitsa	Poz-42054	6940 ± 40	5906–5729	Food crust	Smol'yaninov, 2020, p. 244
Ivnitsa	Poz-42053	6720 ± 40	5719–5611	Food crust	>>
Ivnitsa	Poz-42052	6380 ± 40	5474–5302	Food crust	>>
Karamyshevo 5	Ki-11088	6570 ± 60	5625–5471	Pottery	>>
Neman river region, Neman culture (Dubiciai-type)					
Katra 1	Ki-7642	6550 ± 70	5624–5374	Charcoal	Piličiauskas, 2002, p. 127
Katra 2	Ki-7643	6020 ± 70	5072–4722	Charcoal	>>
Katra 2	Ki-7645	5980 ± 70	5045–4710	Charcoal	>>
Katra 2	Ki-7644	5950 ± 70	5012–4680	Charcoal	>>
Vožna Viešas 1	Gd-2431	5900 ± 100	5033–4536	Charcoal	>>
Southwestern Baltic, Ertebølle culture					
Holmegaard	AAR-8123	6125 ± 48	5213–4936	Bone	Andersen, 2018, p. 279
Holmegaard	AAR-7696	6730 ± 60	5232–5034*	Oysters	>>
Tybrind Vig B	K-5538	6110 ± 95	5223–4796	Wood oak	Andersen, 2013, p. 75, 76
Tybrind Vig B	AAR-9341	6820 ± 55	5406–5225*	Human bone	>>
Schlamersdorf LA 5	KI-3027	6150 ± 60	5221–4935	Charcoal	Hartz, 2011, p. 250
Schlamersdorf LA 5	KI-3028	6240 ± 60	5326–5028	Charcoal	>>

*With correction for marine reservoir effect (= 400 years).

Figure 2: Early pottery of the forest-steppe Volga region, Elshanskaya culture. (1) Ivanovka; (2–5) Chekalino IV; (6–9) Nizhnaya Orlyanka II; (10) V'yunovo Ozero I; (11–13) Il'inka; (14) Utyuzh I; (15) Staraya Elshanka II (after Andreev & Vybornov, 2017, pp. 195, 198, 204–206, 210, 211, 213–215, 233).

1.2 Forest-Steppe Volga Region

The early Neolithic of this territory is represented by complexes of the Elshanskaya culture. The most typical pottery assemblages were obtained at the sites of Ivanovka, Chekalino IV, Staraya Elshanka II, Vyunovo Ozero I, and others. The pottery of the early stage of the Elshanskaya culture is characterized by a set of features: thin walls, smoothed surface, and sand used as a temper. The vessels have an S-shaped profile and a conical bottom. They are almost non-ornamented, less often decorated with roundish impressions under the rim, forming convex imprints or carved lines (Figure 2). According to these typological features, this pottery is quite close to the complexes of the Central Asia considered above. This allowed the researchers to assume their affinity (Andreev & Vybornov, 2017; Vasil'yev & Vybornov, 1988; Vybornov, 2008, 2011).

A large series of radiocarbon dates was obtained for early sites of the Elshanskaya culture; they are dated to ca. 6200 BC, both in the forest-steppe Volga region and in the Middle Sura basin (Vybornov, Andreev, Kul'kova, & Nesterov, 2016, pp. 74–96; Vybornov, Kulkova, Andreev, & Nesterov, 2017) (Table 1). Several dates lying within the beginning of the seventh millennium BC were also obtained for early Neolithic materials of the forest-steppe Volga region, which might suggest even earlier origin of the Elshanskaya culture. However, in view of their scarcity and inconsistency, they are not regarded in this work.

The Elshanskaya culture is characterized by a hunter-gatherer economy with an important input of aquatic resources. Any traces of cattle breeding of agriculture economy were not traced.

1.3 Upper and Middle Don Regions

In this territory, the materials of the early Neolithic are represented by complexes associated with the Elshanskaya culture (the sites of the mouth of the Izlegoshi River 2, Yarlukovskaya Protoka, etc.) or with the Karamyshevskaya culture (sites Ivnitsa, Stupino, Vasilievsky Kordon 7, etc.). The pottery of the early stage of the Karamyshevskaya culture is represented by polished, thin-walled, and poorly ornamented vessels. Their upper part was slightly curved or straight, with pointed bottoms (Figure 3). They were decorated with triangular-form small impressions, incised lines, and rows of pits (Surkov, 2013, pp. 167–186; Smol'yaninov & Surkov, 2014, pp. 161–171; Smol'yaninov, 2020, pp. 48–89).

The earliest materials from the Karamyshevskaya culture of the Ivnitsa site are characterized by profiled decorated vessels with a pointed bottom. Based on a series of radiocarbon determinations, they date to 5900–5600 BC (Table 1). The complexes of the Elshanskaya culture, found on the sites located in the western part of the forest-steppe Volga region can be dated to the same time period. It should be emphasized that the sites of the early Neolithic in the Upper and Middle Don have been started intensively during the last decade, and more complexes and early radiocarbon dates should be expected.

The basis of the economy was hunting and fishing. There are no signs of a productive economy.

In the Dnieper region, similar vessel types are known in the early stage of Volynskaya culture e.g., at the Mostva site, profiled and pointed-bottom vessels with a number of roundish impressions under the rim were found). They are poorly decorated or covered by impressions organized in a net (Kotova, 2002, p. 224). Similar ceramics are found in the materials of the Romankovsky type (Pereverzev & Sorokun, 2010, p. 265; Telegin, 1995, p. 112, 113).

1.4 Pripyat and Neman River Basins

This region includes the territory of the modern Republic of Belarus and Northern Poland. Here the early Neolithic is represented by materials of the Neman culture. Rusakova II, Lysaya Gora, Kamen II, and other sites were found on the territory of Belarus. Pottery attributed to the early and middle (Dubichaysky and

Figure 3: Early pottery of the Upper and Middle Don, Karamyshevskaya culture. (1–4) Ivnitsa; (5) Karamyshevo I; (6 and 7) Plautino; (8 and 9) Ust'ye Izlegoshchi 2; (10 and 11) Vasil'yevskiy Kordon 7 (after Smol'yaninov & Surkov, 2014, pp. 165–169; after Surkov, 2014, pp. 140–144).

Figure 4: Early pottery of the Neman river region, Neman culture. (1) Dobry Bor I; (2) Lysaya Gora (after Čarniauski, 1979, p. 119, 129); (3) Szlachcin; (4) Lipa 5 (after Jóźwiak, 2003, p. 368, 382); (5, 7, 11, and 12) Kamen' II (after Isayenko, 1976, p. 44); (6) Grabina 5 (after Jóźwiak, 2003, p. 361); (8) Yurevichi VI (after Isayenko, 1976, p. 55); (9, 10, and 13) Rusakovka II (after Čarniauski, 1979, p. 96, 97); (14) Boroviki (after Isayenko, 1976, p. 55).

Lysagorsky) stages of Neman culture is close to the materials described above. The surface of the vessels was smoothed, tempered with sand, and vegetation. The pots have a profiled rim, a convex body, sometimes with a rib, and a pointed bottom (Čarniauski, 1979, Figure 11: 6, 8, 9; 33: 15; Isayenko, 1976, Figure 16: 2, 6, 7; 19: 1, 3, 4; Jóźwiak, 2003, p. 382, 385). The vessels are ornamented with rows of pits under the rim, on

the opposite side of which convex imprints were formed. Part of the vessel is not decorated, and another one is covered by thin incised lines organized in a net motif (Figure 4). In the last decade, new early Neolithic materials were identified on the territory of Belarus, which allowed Dubichayskaya culture to be distinguished. In the Upper Dnieper region, the earliest pottery of the Strumel-Gastyatin type was identified (Yezepenko & Tkacheva, 2016, pp. 170–173).

The early stages of the Neman culture are supposed to be dated to ca. 5000 BC (Józwiak, 2003, p. 44, 58) (Table 1). At the same time, the materials of the Narva culture typologically very close to the complexes of the Neman culture (profiled, pointed-bottom, and poorly decorated vessels or decorated by pits and incised lines) (Rimantiene, 1996, p. 143, 144), date back to ca. 5500 BC (Pitsonka, 2011, p. 160). Given a very limited number of radiocarbon dates obtained for the earliest materials of the Neman culture, we might assume its age to be older than identified. It should be noted that at the Dubovy Log 5 site, profiled ceramics with a number of pits under the rim and a conical bottom were obtained, very similar to the Elshanskaya one, which dates back to about 5700 BC.

During the Neolithic period, the basis of the economy was hunting, gathering, and fishing. No evidence of productive economy was found.

1.5 Southern and Western Coast of the Baltic Sea

This territory includes the coasts of Poland, Germany, and Denmark. The earliest pottery was attributed to Ertebølle culture. The most significant collections were obtained at the following settlements: Tanowo 3, Rosenhof, Wangels, and others (Andersen, 2011, p. 196, 203; Hartz, 2011, p. 244, 246, 259; Petersen, 2011, p. 219, 224). There are two types of pottery. The first group is characterized by thick walls and smoothed surface, the paste tempered with mineral inclusions. The second group has thinner walls and is smoothed with a soft tool, tempered by chamotte (Glykou, 2017, pp. 268–272). It is the second group that has the most similarities to the pottery of the Elshanskaya culture. The pottery of the Ertebølle culture is characterized by profiled (S-shaped) vessels with a sharp, in major cases, pointed bottom. The overwhelming majority of vessels were not decorated. Some of the vessels were decorated by pits under the rim, notches on the rim edge, and intersecting lines forming simple motifs were drawn, including a net motive (Figure 5).

According to a large number of radiocarbon dates, the formation of the Ertebølle culture is dated 5400–5000 BC (Table 1). It is important to note that for a number of sites in recent years, earlier dates were obtained: 6905 ± 55 BP (5905–5673 cal BC), 6820 ± 55 BP (5812–5627 cal BC), 6550 ± 80 BP (5620–5390 cal BC) (Andersen, 2013, p. 76). These dates were made on human bones. Due to a small ^{13}C , these dates are not susceptible to the reservoir effect (B. Philippsen, personal communications, June, 2017). Thus, the earliest dates of the Ertebølle culture coincide with the dates of the late phase of the Elshanskaya culture.

The basis of the economy of the population of the Ertebølle culture was hunting, sea, and river fishing, as well as active sea gathering (molluscs). Productive economy was not recorded.

2 Discussion

The pottery complexes of the analyzed cultures show a certain affinity. They are characterized by the following type of pottery: conical bottomed pots with an S-profiled upper part without ornamentation or ornamented with thin intersecting incised lines. In these regions, other types of pottery are also represented within the earliest complexes. Chronologically a consistent formation of pottery complexes is traced in these cultures from east to west. In addition, the bearers of the above cultural traditions had the same economic basis – all of them were hunter-gatherers and fishermen, not familiar with agriculture or cattle breeding.

Figure 5: Early pottery of the southwestern Baltic, Ertebølle culture. (1) Tanowo 3; (2) Wangels; (3) Rude (after Hartz, 2011, p. 244, 259); (4) Hoge Vaart (after Raemaekers, 2011, p. 491); (5 and 6) Rosenhof (after Meurers-Balke & Kalis, 2011, p. 37); (7) Brabrand (after Andersen, 2011, p. 203).

Pottery is an artificially created material that does not occur in nature in a finished form. In the process of its creation, the maker performs a number of sequential and interrelated operations, ranging from the selection of raw materials to firing. Individual technological steps (e.g., the use of chamotte as a temper, ornamentation of the surface of the vessel with incised lines, and others) may be similar among the people who lived in a very remote territory at different times. At the same time, the coincidence of a large number of pottery making techniques among the groups that existed in a fairly limited chronological interval may indicate the presence of a certain connection between them.

In this regard, the hypotheses that assume the eastern path of the spread of pottery making in Europe deserve close attention (Dolukhanov, 2003; Gronenborn, 2011; Timofeev, 1998).

The similarity in the ceramics of these cultures suggests a certain interaction between their bearers. Taking into account the dates of formation of these cultures, we can admit the likelihood of the transfer of skills in pottery making from east to west. In the archaeological literature, there is a large number of hypotheses about the mechanisms of this transmission (human migration, demic diffusion, infiltration, leapfrog colonization, contact, etc.) (Zvelebil, 2004, p. 44). In our opinion, concerning this issue, the most probable is the concept of the direct relocation of the bearers of the skills of the first pottery making.

In our opinion, the transfer of skills in pottery making is not possible without the relocation of their bearers in view of the relative complexity of pottery making and the need for targeted training in it. However, large-scale population migrations cannot be proved due to a strong particularity of each culture. They all are located within different natural-geographical niches, they had various subsistence models, and also similarities with preceding local flint industry can be marked for all the regions. The absence of a “wave” of resettlement is also evidenced by some specificity of pottery making in each of the regions. Rather, it may concern contacts between different cultural groups in border areas, so-called cross-border mobility, based on household and marital relations. The same processes favoring the productive economy distribution can be traced in the Iron Gate region during neolithization phase (Zvelebil, 2004, p. 45, 46). At the same time, climate changes may be one of the main factors that accelerated this process which was associated with the crisis phenomena (aridization) of the second half of the seventh millennium BC. (Kulkova, 2007; Spiridonova & Aleshinskaya, 1999). Also, climatic factors could lead to migration of certain groups of the population. So, for example, the peak of aridization at the end of the seventh millennium BC coincided with the migration of the bearers of the Elshanskaya culture, as a result of pressure from the southern areas (Lower Volga basin), from the forest-steppe Volga region to further west to the Middle and Upper Don region. Considering the most reliable early dates of the Neolithic of Central Asia and the forest-steppe Volga region, we can assume that the beginning of the spread of the ceramic tradition and certain groups of the population were associated with 8.2 ka climatic event. In the southern regions, climatic

Figure 6: Early pottery of Eurasia.

conditions became drier and cooler, prompting populations to leave their settled habitats and move to more favorable areas in the north. Around 6200 BC, climatic conditions typical of the steppe zone were established in the forest-steppe Volga region, while in the southern regions (Central Asia and the Northern Caspian), the climate became more arid (Spiridonova & Aleshinskaya, 1999, p. 25, 26). Thus, the emergence of the early Neolithic ceramic tradition in the area under consideration is not associated with near Eastern cultures with flat-bottomed pottery and a productive economy. A southeastern trend is more likely (Figure 6). It is pertinent to state that in the most archaic oriental pottery cultures with pointed-bottom pottery, markers of a productive economy were not found (Craig, 2016; Gibbs & Jordan, 2016).

3 Conclusion

From our point of view, a certain morphological and technological similarity of the earliest ceramic ware from the Central Asian area to the southwestern shores of the Baltic Sea is not associated with stage-by-stage phenomena. Apparently, it reflects the process of the spread of skills in pottery making over a considerable distance as a result of climatic and economical factors. In our opinion, the transfer of these skills occurred as a result of the interaction of representatives of multicultural groups with a complex hunter-gather economy in border areas and migrations of small groups of the population.

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