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Research paper

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CLAY VESSELS' SHAPES AS AN OBJECT OF STUDY OF THE CULTURAL HISTORY OF ALANS OF THE FOREST-STEPPE DON REGION

Abstract. Alans are one of the ethnic components of the Saltovo-Mayatsk archaeological culture. Antiquities associated with this group are found in the Middle Don basin. The article studies the cultural characteristics of the Alanian groups that left behind the burial sites of this region, on the example of pottery. The object of study are the shapes of clay vessels. The study was carried out according to the methodology developed within the framework of the historical-and-cultural approach to the study of ancient pottery, proposed by A.A. Bobrinsky. The article considers the quantitative composition of unmixed traditions of shaping forms of pottery on sites associated with the Alan component of the Saltovo-Mayatsk culture. The three most numerous categories of ware are analyzed: jugs, mugs and pots. The communities that left behind the catacomb burial grounds of the eastern regions of the Don forest-steppe were culturally more heterogeneous than the communities from the western part. The materials of the Mayatsky complex, Yutanovsky and Podgorovsky burial grounds present unique and inherently mixed sets of morphological traditions. Based on the data of the study of ceramics and their comparison with burial traditions, we consider the Yutanovsky, Podgorovsky, Mayatsky burial grounds as cemeteries of communities that included settlers from the western part of the Don forest-steppe, whose traditions mixed up in new places of residence. The most probable reason for the resettlement of a certain part of the Alanian population to the eastern regions of the forest-steppe Don region can be considered the construction of a series of stone and brick fortresses on the Tikhaya Sosna River, as well as the need to control this section of the Slavic-Khazar frontier. In accordance with the concept, proposed by G.E. Afansiyev, these fortifications were built in the 30-40s of the 9th century. The author suggests that it is these events that can explain the influx of the Alanian population into the eastern regions of the forest-steppe Don region and the formation of more culturally heterogeneous groups in the new places of residence of these people than among the "neighbors" from the western regions of the Don forest-steppe.

Keywords: Alans; Saltovo-Mayatsk culture; pottery; vessel shapes.

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Исследовательская статья

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ФОРМЫ ГЛИНЯНЫХ СОСУДОВ КАК ОБЪЕКТ ИЗУЧЕНИЯ КУЛЬТУРНОЙ ИСТОРИИ АЛАН ЛЕСОСТЕПНОГО ПОДОНЬЯ

Аннотация. Аланы – один из этнических компонентов салтово-маяцкой археологической культуры. Древности, связанные с этим населением, расположены в бассейне Среднего Дона. Статья посвящена изучению культурных особенностей аланских групп, оставивших погребальные памятники данного региона, на примере керамики. Объектом изучения являются формы глиняных сосудов. Исследование выполнено по методике, разработанной в рамках историко-культурного подхода к изучению древней керамики, предложенного А.А. Бобринским. В статье рассмотрен количественный состав несмешанных традиций создания форм глиняной посуды на памятниках, ассоциированных с аланским компонентом салтово-маяцкой культуры. Проанализированы три наиболее многочисленные категории посуды: кувшины, кружки и горшки. В статье показано, что общины, оставившие катакомбные могильники восточных районов донской лесостепи, были в культурном отношении более неоднородными, нежели коллективы из западной части. В материалах Маяцкого комплекса, Ютановского и Подгоровского могильников представлены уникальные и по своей сути смешанные наборы морфологических традиций. На основании данных изучения керамики и их сравнения с погребальными традициями выдвинуто предположение, что Ютановский, Подгоровский, Маяцкий могильники – это кладбища общин, включавших переселенцев из западной части донской лесостепи, традиции которых смешались на новых местах проживания. В качестве наиболее вероятной причины переселения некоторой части аланского населения в восточные районы лесостепного Подонья может рассматриваться строительство серии каменных и кирпичных крепостей на Тихой Сосне, а также необходимость контроля этого участка славяно-хазарского пограничья. В соответствии с концепцией, предложенной Г.Е. Афанасьевым, эти крепости были построены в 30-40-е гг. IX в. В статье высказывается предположение, что именно эти события могут объяснить приток аланского населения в восточные районы лесостепного Полонья и формирование на новых местах проживания этих людей более неоднородных в культурном отношении коллективов, чем у «соседей» из западных районов донской лесостепи.

Ключевые слова: аланы; салтово-маяцкая культура; керамика; формы сосудов.

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Introduction

The Middle Don basin at the end of the I millennium AD was the northwestern periphery of the Khazar Khaganate and the frontier zone with the Slavic world. Circa middle of the 8th century, new population groups settled the region, who then left behind the antiquities of the Saltovo-Mayatsk archaeological culture. One of such groups were Alans who moved to the forest-steppe part of the Donetsk-Don interfluve from the territory of the North Caucasus.

The Alan component of the Saltovo-Mayatsk culture can be clearly seen in the funerary sites. Those were necropolises where people were buried in T-shaped catacombs. Similar structures are well known in the Early Middle Ages in the North Caucasus. The unity of the genetic and anthropological traits of these people, the similarity of the economic structure and food traditions give reasons to attribute the population which built the catacomb necropolises of the Donetsk-Don interfluve to a single consolidated ethnic collective [1, p. 73].

At the present stage of the study of the Saltovo-Mayatsk antiquities, we see the task of identifying the *local* cultural characteristics of different groups of Alans who lived in the second half of the 8th – early 10th centuries in the Middle Don basin as urgent. Such information may lead to further development of at least two research concepts. Firstly, it is the identification in the North Caucasus of the original places of residence of collectives who left behind various catacomb burial grounds of the Saltovo-Mayatsk culture, on the *eve of resettlement* in the Don region. Secondly, it is the study of the cultural processes that took place in the Don forest-steppe region *after the resettlement* of the Alans, and their correlation with the events of the military-political history of the Khazar Khaganate.

This article presents the experience of identifying the cultural characteristics of the collectives of the Don Alans who left behind various funerary sites, based on the analysis of one of the most widespread categories of archaeological sources from the catacomb burial grounds of the Saltovo-Mayatsk culture – pottery.

Object of study, methodology, sources

The object of study are the shapes of clay vessels. This is due to the fact that intact vessels from funerary sites are stored in museums and violation of their integrity for a full-fledged technological analysis is impossible.

The study is based on the results obtained earlier by the author using the method of analyzing vessel shapes from the standpoint of a historical-and-cultural approach to the study of ancient pottery [2]. Its foundations were laid by the originator of this approach – A.A. Bobrinsky [3; 4]. The historical-and-cultural approach is based on the synthesis of data from ethnography, scientific experiment and archeology.

We shall consider the main theoretical and methodological provisions on which the applied research methodology is based.

1) From the standpoint of the historical-and-cultural approach, the object of study is the skills of potters. The vessel shape is considered as the result of the action of certain labor skills applied by the master to make the vessel, and fixed in cultural traditions that are passed down from generation to generation within a certain human collective.

2) The labor skills of tableware manufacturers differ in the degree of stability. This is a common pattern for all spheres of pottery – not only modeling vessel shapes, but also ornamentation and manufacturing technology [5, pp. 243–244; 6, pp. 96–97, 118]. As a result of many years of experiments A.A. Bobrinsky found that when a potter tried to model a vessel of an unfamiliar, new shape for him, first of all, he *changed the overall proportionality* of the vessel, preserving the *outline* of the shape of the sample familiar to him [7, p. 162–163].

The recent experiments conducted on the basis of the Samara expedition for the experimental study of ancient pottery, as well as the results of processing ethnographic material, indicate that there are differences in the stability of labor skills at the outlines of shapes. These data show that the most stable are the skills of modeling the lower parts of the vessel – the body and shoulder, and the least stable are the skills of modeling its upper parts – the cheeks or neck. This trend is quite universal. It manifests itself in different categories of forms – pot-shaped and jug-shaped, among craftsmen of different qualifications, with different modeling experience and different levels of technical equipment [8; 9].

All these data are taken into consideration both in the systematization of vessel shapes from archaeological sites and in the interpretation of analysis data.

3) The methodology used differs in the aim and content of the study from the more common methods of studying vessel shapes – for example, from typology and classification. Such a goal is not to divide the totality of forms into several types/variants/classes, but to identify mass or leading traditions of creating vessel shapes for a particular site. For this purpose, the vessels are studied at different levels of analysis in terms of the degree of detail: I) the overall proportionality (hereinafter as OPP) of the entire vessel, i.e. the ratio of its height and maximum diameter; II) natural structures (construction) of vessels; III) the formation of functional parts of vessels. This indicator is estimated by the OPP of the functional part (the ratio of the height to the half-sum of the base diameters) and the angle of inclination of the lateral line of the skeleton.

Based on the above provisions, the author of this article previously carried out the reconstruction of various unmixed traditions of creating vessel shapes common in the Saltovo-Mayatsk burial grounds of the Middle Don region. Jugs, mugs and pots, being the most numerous categories of Saltovo-Mayatsk ware, were analyzed – a total of 645 vessels from 12 sites. A separate paper is devoted to each of these categories, where all methodological aspects of the analysis are elaborated [10–12].

Two different traditions have been identified in each category of tableware (Fig. 1). In all the categories studied, the parameters of the *body* and *shoulder-brachium*, i.e. those parts that, as noted above, are the most persistent, turned out to be essential for distinguishing different traditions. Specific combinations of features defining different traditions turned out to be different for each category of vessels (Table 1).

Jugs. Within the framework of the first tradition of jugs (hereinafter in the text and tables – J-1), forms with a relatively lower torso are characterized by a weak angle of inclination of the shoulder-*brachium* and a lower OPP of the entire vessel; for jugs with a higher torso, a greater angle of inclination of the shoulder-*brachium* and a relatively higher OPP of the entire vessel are typical. The second tradition (J-2) is distinguished by

the "opposite" combination of the parameters of the torso OPP and the angle of inclination of the shoulder-*brachium*, as well as the absence of the lowest variants of the neck OPP.

Mugs. The first tradition (M-1) includes products with a lower body and a lower shoulder-*brachium*, the second (M-2) – with relatively higher parameters of OPP of these functional parts.

Pots. The first tradition (P-1) is characterized by shapes of relatively higher proportions, the dominance of *brachium*, relatively higher angles of inclination of the body and a relatively higher overall proportionality of the cheek-neck. In the second tradition (P-2), the set of features is "mirrored": low proportions of the entire vessel, predominance of forms with a shoulder, lower angles of inclination of the body and lower overall proportionality of the cheek-neck.

We use the data obtained for a comparative analysis of sites associated with the Alan component of the Saltovo-Mayatsk culture. The paper examines the materials of the Dmitrievsky, Nizhnelubyansky¹, Starosaltovsky, Rubezhansky, Yutanovsky and Mayatsky burial grounds – a total of 277 vessels that correspond to the previously reconstructed unmixed traditions of shaping forms.²

Analysis

Let's consider the assortment of morphological traditions presented in different sites (Table 2–8). In the Dmitrievsky burial ground (Fig. 2, 1–9; Table. 2) the J-1 tradition dominates among jugs – 79.5% of ware, among mugs – the M-1 tradition, to which 90.2% of vessels belong, and among pots – P-1 (all pots). In the Nizhnelubyansky burial ground, the variety of traditions is very similar (Fig. 2, 10–18; Table 3). Among the jugs, 82.4% of the copies belong to J-1, among the mugs and pots, all belong to M-1 and P-1, respectively. In the Starosaltovsky burial ground (Fig. 3, 1-5; Table. 4) the dominance of the tradition of J-2 for jugs was 77.8% of vessels, M-2 for mugs - 75% of vessels. Conclusions on pots are hardly acceptable, as only one piece was found. In Rubezhansky burial ground (Fig. 3, 6-11; Table. 5) the variety is similar to Starosaltovsky. The tradition of J-2 for jugs dominates here – 85.7% of vessels, M-2 for mugs – 75% of vessels. The pots are presented in a single piece. In the Yutanovsky burial ground³ (Fig. 4, 1-6; Table. 6) 90% of jugs belong to the J-2 tradition, 100% of mugs belong to the M-1 tradition. No pots were revealed. In the Podgorovsky burial ground (Fig. 4, 14-21; Table. 7) 90% of jugs belong to the J-1 tradition, 66.7% of mugs correspond to the M-2 tradition. The pots are presented in two specimen, both correspond to the P-2 tradition. In the Mayatsky complex (Fig. 4, 7-13; Table. 8) all jugs belong to the J-2 tradition, all mugs belong to the M-1, all pots belong to the P-2.

^{1.} Some vessels from the Mayatsky complex and the Nizhnelubyansky burial ground were studied according to V.A. Sarapulkin's sketches [25]. The numbers of the graves from which they originate are unknown. In the tables to this article, such cases are indicated with a "?" mark.

^{2.} Here whole forms of vessels from the settlement complexes of Mayatsky are taken into account. This archaeological complex contains no necropolises that researchers could associate with some other groups of the population, besides the Alans. On these grounds, such vessels are attributed to the range of materials related to the Don Alans.

^{3.} The illustrations for this article use unpublished originals of sketches of vessels from the Yutanovsky burial ground, made by G.E. Afansiyev, who provided me with these materials for research purposes. The sketches are currently stored in the author's personal archive. I would like to express my sincere gratitude to G.E. Afanasiyev for the opportunity to work with this material.

Based on the differences in the dominant traditions, all the sites considered form three groups (Fig. 5):

1) Dmitrievsky and Nizhnelubyansky burial grounds. Dominant traditions: *J*-1, *M*-1 and *P*-1;

2) Starosaltovsky and Rubezhansky burial grounds. Dominant traditions: J-2 and M-2. Pots in general are not representative.

These two groups have "opposite" sets of morphological traditions. Each of these sets is repeated on two burial grounds. Given their repeatability and persistence, we propose to call such sets of forms unmixed;

3) Yutanovsky, Podgorovsky and Mayatsky burial grounds. According to the variety of morphological traditions of different categories of vessels, characteristic features of both the first and second groups are recorded in these monuments. For example, Yutanovka and Mayatskoye are closer to the second group in jugs, and to the first in mugs. The Podgorovsky burial ground formally corresponds to the first group in terms of jugs, but differs from it in terms of pots.

The sets of traditions of each site of the third group are somewhat unique. These sites demonstrate similarities with the burial grounds of the first and second groups exclusively according to the dominant traditions *in a particular category* of vessels. If we look at the *entire range* of morphological traditions, then each site of the third group is somewhat different from each other. In essence, the sets of traditions of the third group are mixed.

Comparison of the range of morphological traditions from different sites using multidimensional statistics – the method of principal components – confirms the proposed grouping and its interpretation. The analysis was performed in the *Statistica* software. The comparison of sites was carried out on the basis of quantitative data, namely by the percentage of vessels belonging to different morphological traditions. The results of the analysis are presented in the form of a graph with two axes and a scattered cloud of dots denoting the studied sites (Fig. 6). By the degree of proximity of such dots, it is possible to consider the degree of similarity of sites by the traditions of modeling vessel shapes dominating on them: the closer they are, the more similar they are.

In the left part of the graph (Fig. 6) there are sites of the first group, in the right part – the sites of the second group. In both cases, the sites of the same group are located compactly in relation to each other, both along the first and second main components, i.e. along the horizontal and vertical axes. This indicates strong differences between groups and a high degree of similarity within groups. The Yutanovsky, Podgorovsky and Mayatsky burial grounds are located between the sites of these two groups. They are the most diverse in both the first and second main components. This emphasizes that the third group is the most heterogeneous in terms of sets of morphological traditions, which are mixed in their content.

Is there any connection between the peculiarities of the range of traditions of shaping vessels on different sites and their location in the studied region? Some territorial differences are demonstrated by sites with unmixed and mixed sets of traditions. It should be noted that seven dots on the map are probably not enough to identify any patterns. However, even this volume of material allows us to record certain trends.

Formally, the considered sites form two territorial clusters, the intersection point of which is located in the Yutanovsky archaeological complex. Burial grounds with unmixed sets (i.e. the first and second groups) make up the western territorial cluster (Fig. 7 *a*, *b*, *e*). It is assosiated mainly with the valley of the Seversky Donets, only the Nizhnelubyansky burial ground belongs to the Oskol Valley. Burial grounds with mixed sets, i.e. the third group, form the eastern cluster (Fig. 7 *c*, *f*), which corresponds to the valleys of the Oskol and Tikhaya Sosna rivers.

These are the main results of studying the variety of traditions of vessel shapes on sites associated with the Alan component of the Saltovo-Mayatsk culture.

Discussion

The data obtained raise several questions for discussion:

1) What are the differences between the studied sites according to the dominant traditions of modeling vessel shapes?

2) What explains the fact that on some sites there are stable and repetitive sets of morphological traditions (Groups 1 and 2), and on others – more diverse and non-repeating ones (Group 3)?

3) Why do sites with unmixed sets tend to the western regions of the Don foreststeppe, and sites with mixed sets tend to the eastern ones?

The results of the study of the funeral rite of the Don Alans, obtained by G.E. Afansiyev, may be useful for finding answers to these questions. Афанасьевым. Based on the materials of the Saltovo catacomb burial grounds of the Middle Don region, the researcher identified three burial traditions that may reflect three different tribal groups of the Don Alans: Verkhnesaltovo-Yutanovskaya, Dmitrievskaya-Nizhnelubyanskaya and Mayatskaya [13, p. 91–93].

The burial ritual in accordance with the Verkhnesaltovo-Yutanovskaya tradition is distinguished by the arrangement of longer and deeper dromos, longer, wider and higher burial chambers, the position of all the deceased stretched out on their backs regardless of gender, a relatively smaller number of people buried in one chamber. This tradition is also characterized by some features of the clothing set (the absence of vessels in the dromos, a relatively smaller number of vessels in the chamber, a high percentage of burials with daggers and belt sets, the presence of so-called horned buckles in the graves, etc.).

The Dmitrievsky-Nizhnelubyansky ritual is characterized by shorter and smaller dromoses, less long, wide and high chambers, gender differences in the location of the buried (men lie stretched out on their backs, women on their sides), a relatively large number of people buried in one chamber, the presence of vessels in dromoses, a relatively large number of vessels in chambers, a high percentage complexes with bows, arrows, sabers, as well as some other features.

The Mayatskaya burial tradition is characterized by the smallest sizes of dromoses and chambers, the variety of shapes of the entrance pits of the tombs, the location of the deceased women, both on the left and on the right side. In terms of grave goods and funeral food, this tradition is heterogeneous and combines the features of the Verkhnesaltovo-Yutanovskaya and Dmitrievsky-Nizhnelubyanskaya traditions.

The results of the comparison of data on the morphological and funerary traditions of the Don Alans are shown in Table 9. One funerary tradition is represented on the sites of the first group – Dmitrievsko-Nizhnelubyanskaya. The sites of the second group also feature one, but different funerary tradition – the Verkhnesaltovo-Yutanovskaya. The sites of the third group represent all three well-known funerary traditions in the region, i.e. those mentioned above, as well as the Mayatskaya.

Thus, each *unmixed* set of morphological traditions is consistently associated *with one* particular funeral ritual. *Mixed* sets do *not have* such a connection. In the burial grounds with such sets, different funerary traditions are represented.

The data obtained lead to the conclusion that the reason for the differences in the range of morphological traditions of sites is the cultural characteristics of the communities that left behind the burial grounds considered in this study. We record two forms of manifestation of such features.

The first is the differences between the collectives that left behind different burial grounds, according to the specific cultural traditions that were common in them. Here we refer to the connection of a certain set of forms of ware with a certain funeral ritual. Groups 1 and 2 show that in some collectives of the Don Alans such a connection was quite rigid and stable. Dmitrievsko-Nizhnelubyansky cultural traditions differ from Saltovo-Rubezhansky both in funeral ritual and pottery.

The second is the differences of communities in the degree of cultural homogeneity. All sites with mixed sets of morphological traditions were left by collectives following *different* funeral rituals. Thus, the population groups that left behind the Yutanovsky, Podgorovsky and Mayatsky burial grounds, compared to all the others considered in this article, were culturally the most heterogeneous.

In the previous section of this article, we have noted that sites with unmixed and mixed sets of morphological traditions have some differences in location on the territory of the Don forest-steppe: the first tend to its western regions, and the second - to the eastern ones (Fig. 7 *e*, *f*). In our opinion, this is a key detail for the interpretation of the data obtained in this study. As a hypothesis, we would like to propose one of the versions that could explain both the mechanism of the appearance of sites with mixed sets of morphological traditions and their correspondence to the eastern regions of the forest-steppe Don region.

This version suggests that the communities that buried their dead at the Yutanovsky, Podgorovsky and Mayatsky burial grounds consisted of people who used to live in the western regions of the Don forest-steppe, but later moved to the east, to the valleys of Oskol and Tikhaya Sosna. Here, we are not talking about the relocation of the entire Alan population of the western regions of the Don forest-steppe to the east, but about the resettlement from their places of residence of some individual groups in which there were carriers of *different funerary and pottery traditions*. The presence of carriers of different traditions among the settlers is a key factor that could lead to the formation of culturally heterogeneous collectives in *new places of residence* of these people.

Judging by the archaeological material, the preservation of the cultural characteristics of the Alan groups being resettled was not necessary for the successful solution of tasks during this resettlement. In each catacomb burial ground from the eastern regions of the Don forest-steppe, we see unique combinations of funeral rituals and sets of pottery forms that are absent in the burial grounds of the western regions (Fig. 5; Table 9). This suggests that this event was initiated not by the population itself, but by the Khazar authorities, who were trying to solve some urgent political problems in this way.

Here, it is necessary to recall that in the eastern part of the forest-steppe Don there is a group of stone and brick settlements of the Saltovo-Mayatsk culture (Fig. 7, d). The origins of this architectural tradition, which is very uncharacteristic for the studied region, as well as the purpose of these fortifications and the time of their construction are still being discussed [14–17]. In recent years, G.E. Afansiyev has paid close attention to this issue [18-21]. According to his theory, the construction of a chain of these settlements on the Tikhaya Sosna River reflects the process of marking state borders, which was carried out by the Khazar authorities in the 30-40s of the 9th century, i.e. after 8–9 decades since the appearance of the Alans in the forest-steppe region [20, p. 351-352; 21, p. 106]. This campaign began with the construction of Sarkel on the Lower Don under the leadership of Byzantine craftsmen and continued with the construction of a line of fortresses on the northern border with the Slavs. Calculations made by G.E. Afansiyev showed that the labor costs for the construction of stone and brick settlements were 4-5 times higher than the labor costs for the construction of earthen fortifications more typical of the Saltov culture. In his opinion, this indicates that the construction of such settlements and the provision of this event with all the necessary resources was carried out on the initiative and under the direct control of the state authorities [13, p. 143, 147-150].

Thus, the construction of a series of stone and brick settlements on the Tikhaya Sosna River and the need to control this section of the Slavic-Khazar frontier could be the probable reasons for the influx of the Alan population to the eastern regions of the forest-steppe Don and the formation of culturally more heterogeneous collectives in new places of residence of these people.

Concluding this section of the article, it is necessary to cite one more fact that supports the proposed hypothesis. All ceramic traditions are divided into two spheres: internal and external. Traditions, which are entirely related directly to the activities of potters, belong to the inner tradition – this is the technique and technology of producing vessels. The sphere of external culture includes pottery traditions that are available to the attention of consumers of tableware – these are the shapes and ornamentation of vessels [28, p. 29–30]. This distinction is important for the interpretation of the results of the study of archaeological pottery. Changes in traditions related to internal culture indicate to a greater extent some changes in the composition of manufacturers of tableware, and, on the contrary, changes in the sphere of external culture to a greater extent reflect changes in the composition of consumers.

The diversity of the composition of traditions of designing vessel forms (i.e. traditions of external culture) recorded in the burial grounds of the eastern cluster indicates that these sites reflect the complexity of the cultural composition *among consumers* of pottery. In other words, the ceramic materials of these burial grounds reflect the results of a larger phenomenon than the resettlement of individual groups of potters who followed different morphological traditions.

Conclusion

Summarizing the article, we should list the main conclusions and suggestions that can be made based on the results of the study:

1) Catacomb burial grounds of the eastern regions of the forest-steppe Don were left behind by more culturally heterogeneous groups of the population. In the culture of these people, different pottery and funerary traditions were mixed, known in their "pure form" in the western regions of the Don forest-steppe;

2) It is highly likely that the Yutanovsky, Podgorovsky, Mayatsky burial grounds are cemeteries of communities including settlers from the western part of the Don foreststeppe, whose traditions mixed in new places of residence;

3) The influx of new population to the eastern regions was likely caused by the construction of a series of stone and brick settlements on Tikhaya Sosna River, which took place in 30s-40s of the 9th century, according to G.E. Afanasyiev, as well as the need for further control of this section of the Slavic-Khazar frontier.

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Table 1. Features of unmixed traditions of modeling vessel shapes of the Saltovo-Mayatsk culture in the Middle Don.

Traditions	Features (levels of quality, or state of qualities) according to Tsetlin Yu.B., 2018 [2]								
Jugs									
	OPP of the whole vessel	OPP of the neck	Inclination of the shoulder- brachium	OPP of the body					
J-1, first variant	35-38	29-36	24-25	«low»					
J-1, second variant	39-40	29-40	26-27	«medium/low», rarely «medium»					
J-2, first variant	36-39	36-38	26-27	«low»					
J-2, second variant	38-41	27-35	24-25	«medium/low»					
Mugs									
Mugs	OPP of the sho	oulder-brachium	OPP of t	he body					
M-1	18	3-24	15-	21					
M-2	25	5-29	23-	29					
Pots									
	OPP of the whole body	Structure	Body inclination	OPP of the cheek-neck					
P-1	37 and higher	Г+Щ+ПП+Т+ОТ, Г+Щ/Ш+ПП+Т+ОТ, Г+Ш+ПП+Т+ОТ, Г+Ш+П/ ПП+Т+ОТ, Г+Щ/Ш+П/ ПП+Т+ОТ	15 and higher	«very low»					
P-2	under 36	Г+Щ+П+Т+ОТ, Г+Щ/Ш+П+Т+ОТ, Г+Ш+П+Т+ОТ, Г+Щ+П/ ПП+Т+ОТ	under 14	«very-very low»					

Table 2. Vessels of unmixed morphological traditions from the Dmitrievsky burial ground.

Nº burial/trizna («tr.»)	J-1	J-2	M-1	M-2	P-1	№ burial/trizna («tr.»)	J-1	J-2	M-1	M-2	P-1	№ burial/trizna («tr.»)	J-1	J-2	M-1	M-2	P-1
1	1	1		2		63	1				2	123	2				
2					1	64			1			125	1		1		
3			1			67		1				133					1
5	1					71	1		1			134	2		2		
6	1		1			72		1				135			1		
7			1		1	73	1					138		1			
10			2		2	74	1					140			1		
11	1					77			1			150	2				1

15			2			-0											
17	1					79	1					151	3				
21	2		1			81	1					152	2				
22	2		1			82			1			154	1		1		
23	1		2			83		1				155		1			
26	2	1				86	2		1			165	1				
28			1			89		1		1		167			1		
30			2			92		1				168	1		1		
32			1			94	1					170	1		1		1
36		1				98			1			173	1		1	1	
38	3		3		1	101	1		1			177	1				
42					1	102			1			178	1				
44	1					103	1					179			1		
45	2					106	4					tr10					3
49	1					107		1	1			tr21					1
50	1					108	2					tr26			1		
52			1			109	1	1				tr3			1		
54		1	1			110	2					tr40					2
55	1					111	2					tr46			1		1
56	1					114					1	tr47					1
57		2				116			1			tr5					2
58			1			118	1		1			tr57				1	
59			1			119	1	1	2			tr58					1
61			1			120		1				tr61					2
62	2		1			121	2					tr7					1
The cells indi	cate the nu	mber o	of vess	els. J –	jugs, I	M – mugs, P – pot	s.										

Table 3. Vessels of unmixed morphological traditions from the Nizhnelubyanskay burial ground.

No. burial/ cenotaph («cen.»)	J-1	J-2	M-1	M-2	P-1
37	1				
39		1	1		
40	1		1		
42	1		1		
43			1		
44	3		7		
56			1		
cen50					1
?	8	2			7

Table 4. Vessels of unmixed morphological traditions from the Starosaltovskaya burial ground.

No. catacomb	J-1	J-2	M-1	M-2	P-1
1		1			
2		1			
4		1			
8					1
11		1			
12				1	
13	1				
14		1			
15				1	
16	1				
17			1		
18				1	
20		1			
22		1			

Table 5. Vessels of unmixed morphological traditions from the Rubezhansky burial ground.

No. catacombs	J-1	J-2	M-1	M-2	P-2
3		1			
4	1				
8			1		
9		1			
10				1	
11				1	1
12				1	
13		1			
15		1			
16		1			
17		1			

No. catacombs	J-1	J-2	M-1
4		1	
5			1
6			1
7			1
8		1	
10		1	
11		1	
12			1
13			1
14		1	
19		1	
19		1	
20		1	
1H			1
3H		1	
3П	1		

Table 6. Vessels of unmixed morphological traditions from the Yutanovsky burial ground.

Table 7. Vessels of unmixed morphological traditions from the Podgorovsky burial ground.

No. burial	J-1	J-2	M-1	M-2	P-2
2	1				
5	3				
8				1	
10			1		
11	1				1
12	3				
13			1		
14	1				
Burial 5					1
Burial 2		1			

Table 8. Vessels of unmixed morphological traditions from the Mayatsky complex.

No. complex	J-2	M-1	P-2
?			11
cat. 35	1		
cat. 48	1		
cat. 58	1		
cat. 67	1		
cat. pit 30		2	
trizna 1		2	
trizna 2		1	
trizna 3		1	
trizna 4		1	
trizna 5		1	
trizna 12		1	
pit 14		1	

Table 9. Comparison of data on pottery and burial traditions.

Funerary traditions/Ceramic groups	Group 1	Group 2	Group 3
Dmitrievsko-Nizhnelubyanskaya			
Verkhnesaltovsko-Yutanovskaya			
Mayatskaya			



Fig. 1. Unmixed traditions of modeling vessel shapes among the Saltovo-Mayatsk culture of the Middle Don basin Рис. 1. Несмешанные традиции создания форм сосудов, выделенные по салтово-маяцким материадам

Рис. 1. Несмешанные традиции создания форм сосудов, выделенные по салтово-маяцким материалам бассейна Среднего Дона



Fig. 2. Examples of vessels of group 1 sites. Without scale, identical height. 1-9 – Dmitrievsky burial ground: 1 – cat. 38, 2 – cat. 63, 3 – cat. 5, 4 – cat. 72, 5 – cat. 63, 6 – cat. 6, 7 – cat. 26, 8 – cat. 58, 9 – funeral feast 10; 10-18 – Nizhnelubyansky burial ground: 10, 15-17 – cat. 44, 11 – cat. 42, 12 – cat. 40, 13, 18 – cat. 37, 14 – cenotaph 50

Рис. 2. Примеры форм сосудов, характерных для памятников группы 1. Без масштаба, приведены к одной высоте. 1-9 – Дмитриевский могильник: 1 – кат. 38, 2 – кат. 63, 3 – кат. 5, 4 – кат. 72, 5 – кат. 63, 6 – кат. 6, 7 – кат. 26, 8 – кат. 58, 9 – тризна 10; 10-18 – Нижнелубянский могильник: 10, 15-17 – кат. 44, 11 – кат. 42, 12 – кат. 40, 13, 18 – кат. 37, 14 – кенотаф 50



Fig. 3. Examples of vessels of group 2 sites. Without scale, identical height. 1-5 – Starosaltovsky burial ground. Drawings by V.S. Aksenov [22, fig. 8: 2, 3, 8, 15, 16]: 1 – cat. 20, 2 – cat. 22, 3 – cat. 4, 4 – cat. 12, 5 – cat. 18; 6-11 – Rubezhansky burial ground. Drawings by V.S. Aksenov [23, fig. 7: 1-3, 9; 8: 4, 5]: 6 – cat. 17, 7 – cat. 9, 8 – cat. 3, 9 – cat. 16, 10 – cat. 10, 11 – cat. 12

Рис. 3. Примеры форм сосудов, характерных для памятников группы 2. Без масштаба, приведены к одной высоте. 1-5 – Старосалтовский могильник. Рисунки В.С. Аксенова [22, рис. 8: 2, 3, 8, 15, 16]: 1 – кат. 20, 2 – кат. 22, 3 – кат. 4, 4 – кат. 12, 5 – кат. 18; 6-11 – Рубежанский могильник. Рисунки В.С. Аксенова [23, рис. 7: 1-3, 9; 8: 4, 5]: 6 – кат. 17, 7 – кат. 9, 8 – кат. 3, 9 – кат. 16, 10 – кат. 10, 11 – кат. 12



Fig. 4. Examples of vessels of group 3 sites. Without scale, identical height. 1-6 – Yutanovsky burial ground: 1 – cat. 19, 2 – cat. 20, 3 – cat. 8, 4 – cat. 6, 5 – cat. 1N, 6 – cat. 5. 5, 6 – drawings by G.E. Afanasyev; 7-13 – Mayatsky Complex, according to A.Z. Vinnikov, S.A. Pletneva, G.E. Afanasyev [15, fig. 18: A; 26: B, V; 35: A, B; 24, fig. 5: 6, 7]: 7 – cat. pits 18, 8, 9 – cat. 1, 10 – pit 29, 11 – trizna 3, 12 – trizna 5, 13 – building 24; 14-21 – Podgorovsky burial ground: 14-15 – cat. 12, 16, 21 – cat. 11, 17 – burial 5, 18 – cat. 10, 19 – cat. 13, 20 – cat. 8. 18-20 – drawings by V.A. Sarapulkin [26, fig. 74: 15; 27, fig. 64: 9; 73: 20]

Рис. 4. Примеры форм сосудов, характерных для памятников группы 3. Без масштаба, приведены к одной высоте. 1-6 – Ютановский могильник: 1 – кат. 19, 2 – кат. 20, 3 – кат. 8, 4 – кат. 6, 5 – кат. 1H, 6 – кат. 5. 5, 6 – рисунки Г.Е. Афанасьева; 7-13 – Маяцкий комплекс, по А.З. Винникову, С.А. Плетневой, Г.Е. Афанасьеву [15, рис. 18: А; 26: Б, В; 35: А, В; 24, рис. 5: 6, 7]: 7 – кат. ямы 18, 8, 9 – кат. 1, 10 – яма 29, 11 – тризна 3, 12 – тризна 5, 13 – постройка 24; 14-21 – Подгоровский могильник: 14-15 – кат. 12, 16, 21 – кат. 11, 17 – погр. 5, 18 – кат. 10, 19 – кат. 13, 20 – кат. 8. 18-20 – рисунки В.А. Сарапулкина [26, рис. 74: 15; 27, рис. 64: 9; 73: 20]

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Fig. 5. The composition of morphological traditions in the analyzed sites: a- traditions K-1, Kr-1, G-1, b- traditions K-2, Kr-2, G-2

Рис. 5. Состав морфологических традиций в анализируемых памятниках: а – традиции К-1, Кр-1, Г-1, б – традиции К-2, Кр-2, Г-2



Fig. 6. Results of morphological traditions comparison by the principal components analysis Рис. 6. Результаты сравнения ассортимента морфологических традиций методом главных компонент



Fig. 7. The location of the studied sites: a – group 1, b – group 2, v – group 3, g – stone and brick fortresses of the Saltovo-Mayatsk culture on the Tikhaya Sosna, d – western territorial cluster, e – eastern territorial cluster

Рис. 7. Расположение исследуемых памятников: а – памятники группы 1, б – памятники группы 2, в – памятники группы 3, г – каменные и кирпичные крепости салтово-маяцкой культуры на р. Тихая Сосна, д – западный территориальный кластер, е – восточный территориальный кластер

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