

Formation of Ceramic Traditions of the Late Bronze Age in the Trans-Urals



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Abstract It is believed that the Bronze Age of the Trans-Urals began with the migration of the Poltavka, Catacomb, and Abashevo tribes from Eastern Europe. This resulted in the appearance of the Sintashta culture. Then, at the beginning of the Late Bronze Age, Petrovka was formed based on Sintashta, and based on Petrovka, next, Alakul was formed. But the Sintashta ceramic tradition has no distinct prototypes in Eastern Europe. On the other hand, studying the morphology and technology of making pottery shows that these features are noticeably present in the early Alakul and Petrovka. In addition, the early Alakul ceramics was not formed from the Petrovka traditions but directly from the Sintashta ones. Therefore, Petrovka and early Alakul co-occurred with the Sintashta formation in neighboring areas to the east and northeast. Their formation resulted from the Sintashta migration when some Eastern European communities were displaced to the east. The Poltavka and Sintashta communities had taken part in this process. Then, at the end of the Sintashta period, under the pressure of the Fyodorovka tribes who came from the east, a part of the Alakul population was forced out of the forest-steppe into the steppe, and the dominance of the Alakul culture began in the western part of the Andronovo area.

Keywords Late Bronze Age · Trans-Urals and Kazakhstan · Pottery · Forms and Ornamentations · Technologies

1 Introduction

Ceramic traditions are a complex phenomenon, which in its most general form can be divided into morphological, reflecting the external side of production (form and ornamentation), and technological features, reflecting the inner side of the production

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process, hidden from the eyes of consumers. Their formation and development are influenced by various factors: the preservation of old traditions (local or brought into the region by a migrating group), the interaction of different groups, and the specifics of raw materials. These factors are reflected in different ways in the morphology and technology of the ware. Morphology reflects two sometimes contradictory factors: on the one hand, traditions and the collective representations of belonging to a certain group; on the other, it can be influenced by fashion. Technologies are more conservative since they are transmitted, as a rule, by contact in a related environment. Therefore, the morphology of the ware reflects some reflected cultural unity and technology—the participation of the populations that formed this unity.

In the Trans-Urals, the transition to the Late Bronze Age and its early phases are associated with the formation of the Sintashta, Petrovka, and Alakul cultures (Fig. 1). There are two hypotheses for the formation of Sintashta: (1) as a result of migration of the Poltavka, Catacomb, and Abashevo tribes from Eastern Europe; (2) as a result of migration from the Near East and Transcaucasia, with the involvement of Eastern European groups.

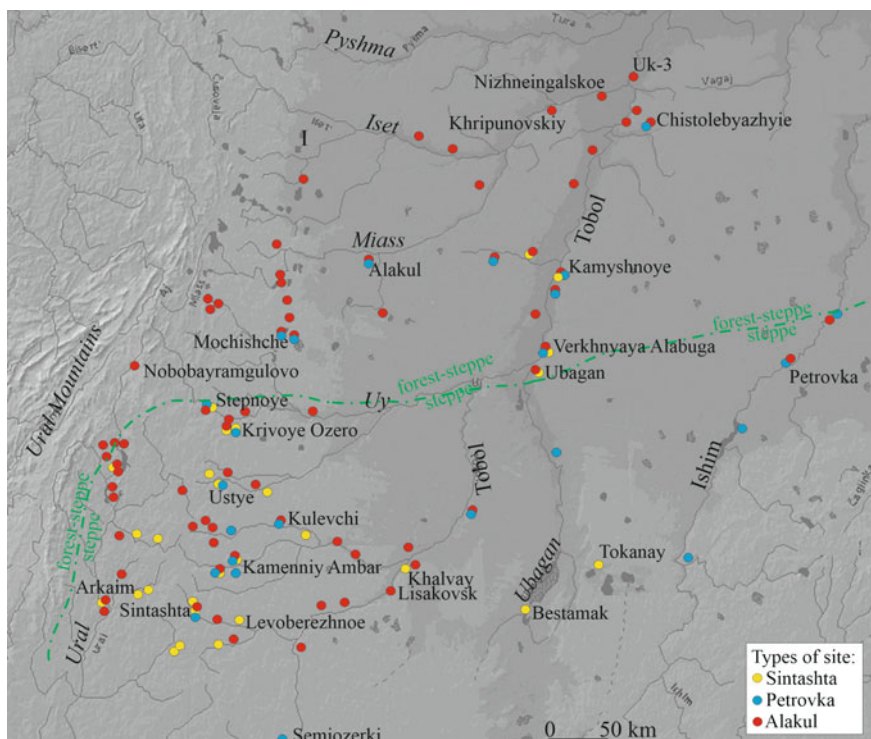


Fig. 1 Map of the sites

Before, it was assumed that cultural genesis in the Trans-Urals could be represented as a sequential series of genetically related cultures: Sintashta—Petrovka—Alakul. Then the idea was put forward of the formation of Alakul and Petrovka directly on the Sintashta basis simultaneously within the Sintashta period, with some delay after the Sintashta formation (see for more details: Grigoriev et al. 2018, Grigoriev 2021). Analysis of ceramic complexes allows us to correct the latter position partly.

Within the framework of radiocarbon chronology, the Sintashta culture was previously dated within 2200–1650 BC, which coincided with the dates of the early Alakul sites in the forest-steppe of the Tobol area and Transurals from the twenty-third century BCE. Using AMS dates allows Sintashta to obtain a younger date interval within 2010–1770 BCE. Still, the early Petrovka and Alakul dates, obtained by the same method, fall within this interval, although they are somewhat younger (Krause et al. 2019, p. 61; Panyushkina et al. 2008). However, it should be noted that these dates originate from the eastern part of the Sintashta area and do not reflect the chronology of the early Alakul and Petrovka sites in the northeast and east. However, some typological evidence also points to the partial synchronization of Sintashta, Petrovka, and Alakul (Grigoriev et al. 2018, p. 158–168).

2 Materials and Methods

The technical and technological analysis of ceramics is based on the method developed by Bobrinsky (1978). The analysis involves a microscopic study of chips of ceramic objects using an MBS-10 microscope at 16–32-fold magnification, during which the characteristics of the raw material and the components added to it are determined. The obtained data on the qualitative composition of the raw materials and the paste components are compared with the standard base. This base was created for 30 years in the Samara expedition for the experimental study of ancient pottery and is based on archeological and ethnographic data. To obtain unified observation conditions, all ceramic samples and standard samples are heated in a muffle furnace to 800–850 °C.

Analysis of the composition of the raw materials and components of the paste is carried out at a qualitative and quantitative level. At the qualitative level, the shape, color, and preservation of inclusions are fixed; at the quantitative level, the number of different inclusions per area of 1 cm², for which standard samples are made in the form of bars 10 cm long with an area of 1 cm².

When studying the raw materials (silts and clays), the qualitative and quantitative composition of sand and other minerals of natural origins, shells, and remains of aquatic flora and fauna are analyzed and compared with standard samples. The standard base contains more than 100 silt samples from various reservoirs of the Volga and Ural regions and more than 300 clay samples from different regions of Russia.

When analyzing the paste components, mineral and organic components are distinguished. Mineral components include chamotte—old crushed ceramics,

gruss—crushed stone, slag—waste from metallurgical production, and sand. The organic components are ruminant manure, organic solutions, mollusk shells, calcined bone, etc. We consider the features of the preliminary preparation of the components and their concentration in the paste composition. For mineral components, this is heating, crushing, grinding, sizing, or lack thereof; for organic—the state of raw materials (dry or wet), as well as preliminary preparation: cleaning, rubbing, preheating. For mineral inclusions, their concentration is determined, i.e., the number of inclusions of a certain size per 1 cm². The data obtained are compared with the standard base, which includes 76 positions for organic additions and about 200 for mineral additions.

Currently, the standard database for the ceramic study is available on the Internet for free access: <http://archsamara.ru/katalog/>.

3 Results and Discussion

3.1 Pottery Morphology

The Sintashta ceramic tradition is quite original in form and ornamentation, although it contains some Abashevo and Catacomb features. There are isolated inclusions of vessels with Poltavka features (the Bolshekaraganskiy cemetery), but in general, the Poltavka culture had little impact on the formation of the Sintashta complex. The forms and ornaments of the Petrovka and Alakul traditions were formed on the Sintashta basis. Still, the Petrovka ware looks more simplified, with a reduction in the number of ornamental motifs and a decrease in the proportion of the comb stamp in the decoration. For this reason, the early Alakul tradition cannot be derived from the Petrovka tradition (at the Mochishche settlement, the similarity coefficient of these types is very low—0.33). It was formed directly on the Sintashta basis, although with its further spread to the areas previously occupied by the Petrovka culture, it absorbed some Petrovka elements. An important specific feature of the Petrovka and Alakul ceramic complexes is the presence of ware comparable to the Poltavka ware of the classical stage: pot-and-jar forms with a short vertical rim, decorated with horizontal combed ornaments or ‘walking’ comb. Significantly, such ceramics have not been found in the forest-steppe Transurals north of the Sintashta area; they are present on the Tobol and Ishim rivers to the east. In addition, some minimal Catacomb features are present in the Alakul ceramics in the entire Tobol region. Therefore, the formation of the morphological features of the Alakul and Petrovka ware was based, first of all, on the Sintashta tradition; in the Alakul and Petrovka ware of the Tobol and Ishim regions, the Poltavka traditions are visible, but to an incomparably lesser extent than the Sintashta ones. The Sintashta penetration is marked by finds in the Petrovka area in the steppe interfluvium of the Tobol and Irtysh rivers in the cemeteries of Bestamak, Tokanay-1, and Halvay 3. In the early Alakul area, the Sintashta presence in the Tobol forest-steppe is visible on the settlements of Kamyshnoe I and II, and the

cemeteries of Verkhnyaya Alabuga and Ubagan I. Probably, the latter determined the statistically recorded ornamental similarity between the pottery of Mochishche and the sites of the Tobol region: Uk 3, Alakul, and Chistoleyazhye (Grigoriev et al. 2018).

3.2 Ceramic Production Technology

A comparative analysis of the published technological data (from the cemeteries of Krivoe Ozero, Kamennyi Ambar, Halvay 3, and the settlements of Ustye and Mochishche) made it possible to distinguish in the pottery of the Alakul and Petrovka populations features that are typical for the Sintashta ware: (1) the use of predominantly ferrous clays; (2) the predominance of recipes ‘clay + talc + organic’ and ‘clay + talc + chamotte + organic’; (3) potters started to make vessels from the bottom, and used form-models; (4) surface treatment by smoothing and polishing; (5) firing in simple constructions in a reducing or oxidizing atmosphere when the temperature of incandescence was reached. But there is a difference: in the Alakul pottery, we see the surface polishing characteristic of the Sintashta ceramics, noted only on individual Petrovka vessels. This observation allows us to assume a direct perception of the Sintashta tradition by Alakul potters without the mediation of Petrovka pottery (Grigoriev and Salugina 2020). The materials of the Krivoe Ozero cemetery lead to this conclusion, as 20% of Sintashta ceramics were polished (Gutkov 2003, p. 316). The same conclusion was made for the Halvay 3 cemetery, where 89% of the studied Sintashta ceramics have polished surfaces (Shevnina 2015, p. 107).

At the same time, on some Sintashta sites, there is an admixture of Eastern European ceramic traditions in the form of the use of silty clays with a natural admixture of shells and artificial additions of crushed shells. In the cemetery of Krivoe Ozero, the proportion of these ceramics is 3% (Gutkov 2003, p. 316); in the settlement of Ustye—13.3% (Gutkov 2013, p. 179); in the settlement of Kamennyi Ambar—10% (Dubovsteva et al. 2016, p. 100), and in the settlement of Levoberezhnoe—19.4% (Gutkov 2020, p. 205–207). But to the east, on the Petrovka sites, the proportion of ceramics with the admixture of shells grows to 50% on the settlement of Semiozerno II. It is quite noticeable on the sites of the Ishim region (Evdokimov et al. 2016, p. 36). This shell admixture was also noted in the early Alakul complexes of the Tobol region on the cemetery of Verkhnyaya Alabuga (Potemkina 1985, p. 197) and further north on the cemeteries of Uk 3 (up to 82%) and Nizhneingalskoe 3. At the same time, the use of form models in the Lower Tobol region was not noted (Ilyushina 2012, p. 41, 45–46; 2015, p. 58). These differences between the Alakul ceramics in the Transurals and Tobol regions are also manifested in the Koptiyaki pottery formed on the Alakul basis, for which making on the form-models was noted in the Transurals but not in the Tobol area.

Thus, in the ceramic complex of the Sintashta culture in the steppe Transurals, East European features in morphology and technology are rather weakly expressed. These features are more noticeable in the Petrovka and Alakul ceramics. At the same

time, we observe a paradox: the Alakul and Petrovka ware, except for some inherited traditions of the Poltavka culture, are based on the Sintashta tradition. Types with Poltavka features are found east of the main Sintashta area and are not typical of the Ural-Tobol interfluvium. However, the situation with ceramic technologies is different. In the Trans-Urals, Petrovka and Alakul inherited the Sintashta traditions of making pottery, but, at least in some settlements of the Lower Tobol region, they are not recorded. No less indicative is that outside the Sintashta area in the east and northeast, the proportion of ceramics with shell admixtures characteristic of Eastern Europe increases sharply (up to 50–80%), which correlates well with the presence of ware with Poltavka analogies there. In the Sintashta complexes proper, the proportion of ware with this admixture varies from 3 to 19%, and hybridization of various ceramic traditions is observed. Therefore, if the Petrovka and Alakul traditions were formed later than the Sintashta traditions, in their technologies in the east, these East European traditions would have already been eroded, as is the case of Mochishche, or more mixed traditions with a predominance of Sintashta would have manifested themselves.

This situation can be explained by the fact that the early Alakul tradition in the Tobol region and the Petrovka tradition in Kazakhstan started to form simultaneously with the Sintashta culture. In line with the hypothesis about the formation of Sintashta as a result of migration from the Near East and Transcaucasia (Grigoriev 2002), we assume that people of the Sintashta migration flow in its movement to the east, having overcome the Caucasus, captured part of the East European Poltavka groups. Their proportion in the formation of Petrovka and Alakul was noticeably higher than in the formation of Sintashta in the Trans-Urals. Accordingly, in the demographic sense in the formation of Petrovka and Alakul, the leading role was played by the Eastern European groups, but the Sintashta people also took part. The latter is especially evident in ceramic styles, which reflects the inclusion of these areas in the Sintashta system of connections and relations. Nevertheless, some other processes contributed to (1) the consolidation of forest-steppe groups and the formation of a specific Alakul ceramic type, (2) the consolidation of steppe groups with the formation of the Petrovka type. The latter was in the socio-economic and cultural sense closer to Sintashta, which led to their more active interaction. As a result, in the east of the Sintashta area along the tributaries of the Tobol in the steppe Transurals, the Sintashta ceramic type is being transformed into the Petrovka type.

Living in more favorable forest-steppe regions, the Alakul population had conditions for demographic growth. With the movement of the Fyodorovka tribes from the east along the forest-steppe, which coincided with the end of the Sintashta culture, the Alakul population was partly assimilated. Still, the main mass was displaced into the steppe, resulting in a wide distribution of Alakul stereotypes, leading in the Late Bronze Age of the central and western parts of the Andronovo area.

4 Conclusions

Comparison of ceramic styles and technologies allows a more specific discussion of the problems of the cultural genesis of the Late Bronze Age in the Transurals and Kazakhstan. Currently, such works have been carried out only for some sites and areas, which does not allow obtaining a detailed and complete picture. Based on our data, we can conclude that the Sintashta ceramic tradition had no roots in Eastern Europe. At the same time, to the east, in the Petrovka and Alakul ceramics, the features of the Eastern European cultures, primarily the Poltavka ones, are much better expressed. However, in the stylistic sense, the Sintashta tradition was dominant in their formation. The following forms of the region's Late Bronze Age ceramic traditions are associated, first of all, with the early Alakul tradition formed in the forest steppe during the Sintashta period.

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