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HISTORIC AND CULTURAL SITUATION AT THE TURN OF THE BRONZE AND IRON AGES IN THE TRANS-URALS

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Abstract: The article is devoted to the generalization and systematization of archaeological materials obtained during the excavations of sites of the late Bronze and early Early Iron Ages on the territory of the Trans-Urals. Comparative characteristics of the main life-supporting elements (settlement system, settlement planning, house-building, economy, ceramic production) of the carriers of the Mezhovka, Barkhatovo, Gamayun, Itkul (Iset) and Baitovo cultures made it possible for the authors to present one of the options for the development of the cultural-historical situation in the Trans-Urals forest-steppe and subtaiga zones at the turn of the Bronze and Iron epochs. Qualitative and quantitative data indicate dynamic transformation processes during this period, confirm the synchronicity of the Mezhovka and Barkhatovo cultures, the alien character of the Gamayun and Itkul (Iset) groups at the end of the Bronze Age and the continuity of the Barkhatovo-Baitovo antiquities. At the initial stage of the early Iron Age, representatives of the Itkul culture shared the space of the forest-steppe — subtaiga with the Baitovo communities. The alien traditions are becoming obsolete and there is a complete replacement of the local "standard" — Baitovo before the spread of the Sargat-Gorokhov influence.

Keywords: Trans-Urals, complexes with cross ornamentation pottery, Barkhatovo Culture, Gamayun Culture, Itkul Culture, Baitovo Culture

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ИСТОРИКО-КУЛЬТУРНАЯ СИТУАЦИЯ НА РУБЕЖЕ БРОНЗЫ И ЖЕЛЕЗА В ЗАУРАЛЬЕ

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Резюме: Статья посвящена обобщению и систематизации археологических материалов, полученных при раскопках памятников конца бронзового и начала раннего железного века на территории Зауралья. Сопоставительная характеристика основных жизнеобеспечивающих элементов (система расселения, планировка поселков, домостроительство, хозяйство, керамическое производство) носителей межовской, бархатовской, гамаюнской, иткульской (исетской) и баитовской культур дала возможность представить авторам один из вариантов развития культурно-исторической ситуации в лесостепной и подтаежной зонах Зауралья на рубе-

же эпох — бронзы и железа. Качественные и количественные данные свидетельствуют о динамичных трансформационных процессах в этот период, подтверждают синхронность межовской и бархатовской культур, пришлый характер гамаюнских и иткульских (исетских) коллективов в конце бронзового века и преемственность бархатово-баитовских древностей. На начальном этапе раннего железного века представители иткульской культуры делят пространство лесостепи — подтайги с баитовскими общинами. Пришлые традиции изживают себя и происходит полное замещение местным «стандартом» — баитовским до распространения саргатско-гороховского влияния.

Ключевые слова: Зауралье, комплексы с крестовой орнаментацией керамики, бархатовская культура, гамаюнская культура, иткульская культура, баитовская культура

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Introduction

The turn of the Bronze Age and the Early Iron Age (ca. 9th–6th c. BC) in Western Siberia was marked by the wide presence of sites containing pottery with cross ornamentation (Atlym, Krasnoozerka, Molchanovo, Zavyalovo and other cultures). Their ceramic complexes show clear signs of contacts of the local and migrant populations. Pottery with a pattern of crossed impressions is a specific indicator of infiltration of the taiga groups into the forest-steppe of Western Siberia. Processes of assimilation of the newcomers into these cultures are reflected in dynamics — crossed ornaments get woven into the Late Bronze Age ornamental scheme, replacing particular patterns without disrupting them, and over time disappear during the Early Iron Age, giving way to the autochthonous ornamental tradition [Abramov, Stefanov, 1985].

Unlike other regions of Western Siberia, the presence of representatives of the cultures with cross ornamentation of ceramics in the eastern part of the Trans-Urals in the valley of the Tobol River, was minimal. Only three fortified settlements — Andreevskoye 5 and 7, and Ust-Utyak 1 hillforts — can be reliably attributed to the complexes of ceramics with cross ornamentation; in other cases, the sites contain isolated fragments of vessels with cross pattern. However, the territory was not vacant — it was inhabited by groups that also suffered the influence of general cultural processes of this period. At the end of the Bronze Age, the Trans-Urals communities were not culturally homogenous. Indeed, each cultural formation occupied its ecological and landscape niche in the region; in the border areas, the distribution areas of the cultures occasionally overlapped, contacts of various intensity levels have been recorded among their representatives. To understand the specifics of the formation of cultures in the Early Iron Age, one needs to analyse the historical situation in the Trans-Urals at the final stage of the Bronze Age, and in the transitional time. As such, we aim to present one of the possible pathways of cultural and historical development in the Trans-Ural forest-steppe at the turn of the Bronze and Early Iron Ages. The lack of burials and the paucity of anthropological data make the ethnogenetic reconstructions impossible. The cultures of the final Bronze — Early Iron Age of the Trans-Urals are represented only by settlement complexes.

Different perspectives on the cultural genesis of the Trans-Ural forest-steppe and sub-taiga regions are outlined in V.A. Zakh [2007] and V.A. Borzunov [2019].

Materials and Methods

For the forest-steppe and sub-taiga territories of the Trans-Urals — a natural region bordering Urals on the east and comprising western areas of the West Siberian Plain in the Tobol River basin — several cultures have been identified for the considered period, partly being interrelated, yet carrying a number of differentiating features (Fig. 1).

Barkhatovo Culture was localized in the Trans-Urals, in the valley of the Tobol River and its tributaries. The Culture is dated to the 2nd mill. BC — 10th–9th c. BC [Korochkova, 1987; Matveyev, Anoshko, 2009] (Fig. 2). Among the settlements, there are unfortified and fortified villages. At present, 48 Barkhatovo sites are known; a third of them have been excavated (the villages of Zavodoukovskoye-9 and 10, Novo-Shadrino-2 and 7 (excavation 2), Palatki-2, Shchetkovo 2, Mostovoye, as well as Krasnogorskoye, Kolovskoye, Miasskoye and Ust-Utyakskoye-1 hillforts). Characteristic for the Barkhatovo groups was a riverside type of settling. Housebuilding represented single-chambered frame-and-pillar dwellings of 12 to 210 m^2 in area. Residential structures had a simple hearth in the centre, a portal, a ramp; the entrance was in the form of a long narrow corridor. There were utility structures among the buildings — they were small, slightly deepened into ground, without a hearth. Trenches, ramparts, additional wooden and earthen structures have been found in the Barkhatovo hillforts. Population of the Barkhatovo Culture had diverse economy with predominance of the home-pasture stockbreeding. The proportion of appropriating activities — hunting (14.3–28.1% in settlements and 5.9–9% in hillforts) and fishing was quite high. In the unfortified Barkhatovo settlements, cattle bones (31.7–50%) prevail, followed by horse bones 18.7–31.6%, and small cattle — 3.9–32.3%. In hillforts, horse bones (48.1–64.6%) prevail. Pottery of the Barkhatovo sites is represented by vessels made of clay with the inclusion of sand and chamotte. Morphologically, the pottery appears as vessels with low neck bent outwards or vertical, with a thickening in the lower part of the neck in 45% of the vessels. The pattern consists of simple figures in the form of inclined and horizontal lines, mesh, vertical and horizontal chevrons, less often complex motifs of dashed triangles, diamonds and ribbons, "flags". The essential element of the pattern on the necks of the vessels are pearls (9.4–72%), round pits (8.1–19.8%), drop-shaped dents (3.5–30.2%). Characteristic is a pattern of two parallel lines, breaking vertically all ornamental space of the vessel. In the end of the 2nd mill. BC, which includes the initial stage of the development of Barkhatovo Culture, the settlements were not fortified; the pottery complexes of these settlements include items of foreign cultures with a pattern of cross impressions.

In the 10th–9th c. BC, during the developed stage of the culture, defensive structures appear within the settlements, and items of foreign *Gamayun Culture* have been recorded in the pottery complexes, with cross ornaments and the inclusion of talc in the clay. In the centre of the distribution area of the Barkhatovo Culture (in the Krasnogorsk hillfort), the Gamayun shards have only been found as single fragments. In the south and south-west of the area, in the Miass and Ust-Utyak hillforts of the Barkhatovo Culture, the vessels of the Gamayun Culture comprise no more than 30%; vessels with mixed Barkhatovo-Gamayun features have

also been identified [Zimina, Zakh, 2009: 144, Fig. 88]. Settlements of the Gamayun Culture (10th/9th–4th c. BC) (Fig. 2), which was formed on Konda, Tavda and Lozva in the process of migrations of the Altym Culture population of the Ob River region and its interaction with the population of the Lozva Culture of the Konda River, which began around the 12th c. BC [Borzunov, 1992: 130], have been found not only in the Trans-Urals, but also in the Cis-Urals though the majority of them are located along the eastern slope of the Ural Range [Borzunov, 1992: 160, Fig. 1]. During the preceding period, the *Mezhovka Culture* (12th–7th c. BC) was spread across both sides of the Ural Range — in the Cis-Urals in the Kama River basin to the west, in the areas of the Middle and Southern Trans-Urals to the east, no further than the middle reaches of the Iset River [Obydennov, Shorin, 1995: 97] (Fig. 2).

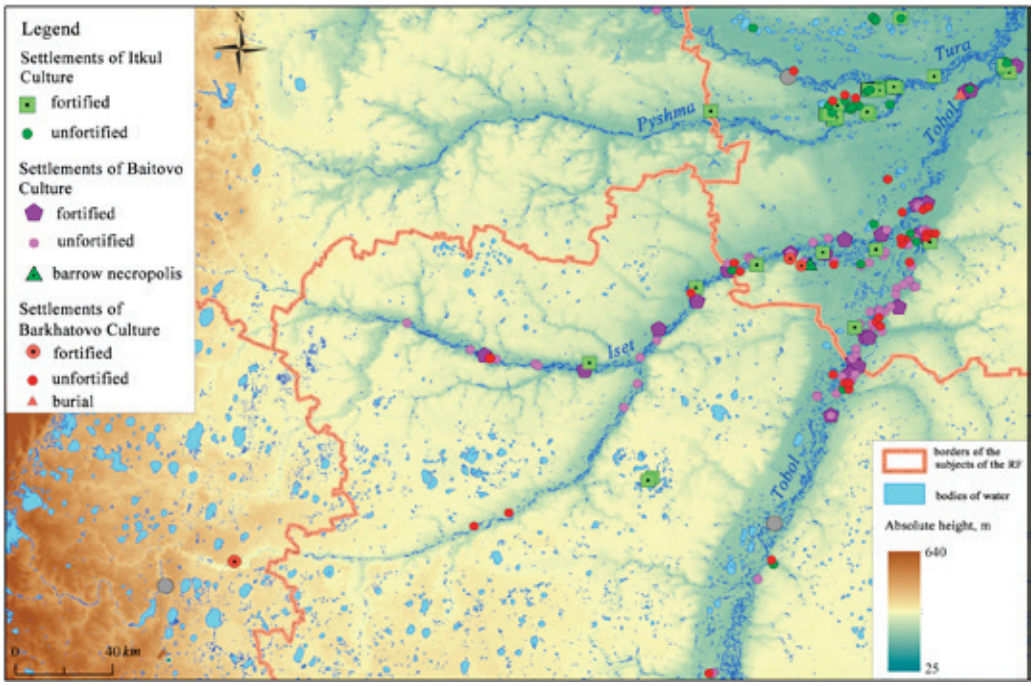

Fig. 1. Map of the settlements of the Barkhatovo, Itkul and Baitovo cultures in the Trans-Urals
Рис. 1. Карта памятников бархатовской, иткульской и баитовской культур в Зауралье

During the transitional time from the Bronze to the Iron Age, settlements of the *Itkul Culture* (7th–3rd/2nd c. BC) appeared in the Trans-Urals, with two types of pottery. The settlements with the type I of the Itkul pottery are localized along the eastern slopes of the Urals, on the basis of which the Itkul centre of metallurgy developed [Beltikova, 2005]. In the plain regions of the Trans-Urals, in the valley of the Tobol River, in the 8th–7th c. BC, according to radiocarbon data, weakly fortified circular settlements appeared, which were termed the *eastern variant of the Itkul Culture*, as the pottery complex of these fortifications was identical to the Itkul type II pottery [Zimina, Zakh, 2009] (Fig. 3).

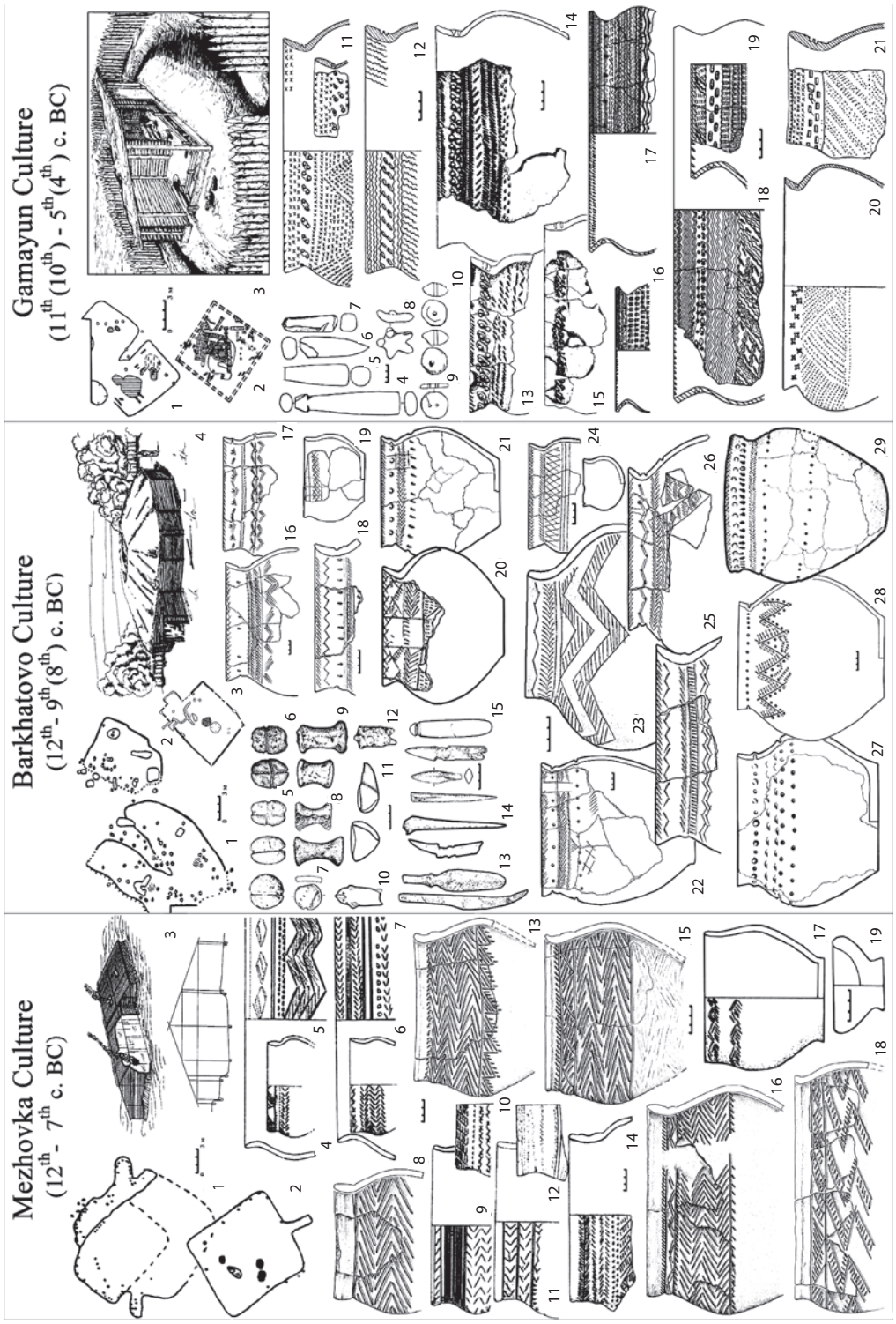
Mezhovka Culture
(12th - 7th c. BC)
Barkhatovo Culture
(12th- 9th(8th) c. BC)
Gamayun Culture
(11th(10th) - 5th(4th) c. BC)

Fig. 2. Archaeological cultures of the final stage of the Bronze Age in the Trans-Urals. Mezhovka Culture (after [M. F. Obydennov, 1997; V. T. Petrin, T. I. Nokhrina, A. F. Shorin, 1993; L. Y. Petrova, 2018]): 1 — Yukalikulevo-4; 2 — Kumlekul; 3 — Staro-Kabanovskoe; 4–7, 9–12, 14, 17 — Berezki-5; 8, 13, 15, 16, 18 — Arkhangelsk Mine-2; 19 — Maly Linden-9. Barkhatovo Culture (after [A. V. Matveev, O. M. Anoshko, 2009]): 1, 2, 10, 11, 14, 19 — Krasnogorskoe; 3, 6, 9, 20, 21 — Kolovskoe; 4, 5, 7, 8, 12, 13, 15, 24, 27 — Shchetkovo-2; 16, 17, 23, 26 — Novo-Shadrino-7; 18, 22, 25 — Novo-Shadrino-2; 28 — Zavodoukovskoe-9; 29 — Miass. Gamayun Culture (after [V. A. Borzunov, 1992, 2019; O. Y. Zimina, V. A. Zakh, 2009]): 1, 6, 7 — Kamenogorskoe; 2 — Palkinskoe; 3 — Tumanskoe; 4, 5, 9 — Zotinskoe-4; 8 — Elovskoe; 10 — Oskinskoe-1; 11, 12, 20, 21 — Andreevskoe-5, 7; 13–15 — Ust-Utyak; 16–19 — Shallow Lake

Рис. 2. Археологические культуры заключительного этапа бронзового века в Зауралье. Межовская культура (по: [Обыденнов, 1997; Петрин, Нохрина, Шорин, 1993; Петрова, 2018]): 1 — Юкаликулево-4; 2 — Кумлекуль; 3 — Старо-Кабановское; 4–7, 9–12, 14, 17 — Березки-5; 8, 13, 15, 16, 18 — Архангельский Прииск-2; 19 — Малый Липовый-9. Бархатовская культура (по: [Матвеев, Аношко, 2009]): 1, 2, 10, 11, 14, 19 — Красногорское; 3, 6, 9, 20, 21 — Коловское; 4, 5, 7, 8, 12, 13, 15, 24, 27 — Щетково-2; 16, 17, 23, 26 — Ново-Шадрино-7; 18, 22, 25 — Ново-Шадрино-2; 28 — Заводоуковское-9; 29 — Миасское. Гамаюнская культура (по: [Борзунов, 1992, 2019; Зимина, Зах, 2009]): 1, 6, 7 — Каменогорское; 2 — Палкинское; 3 — Туманское; 4, 5, 9 — Зотинское-4; 8 — Еловское; 10 — Оськинское-1; 11, 12, 20, 21 — Андреевское-5, 7; 13–15 — Усть-Утякское; 16–19 — Мелкое Озеро

Currently, V.A. Borzunov proposes to name this pottery and, accordingly, the culture, Iset, and he dates it to ca. 9th/8th–4th c. BC [Borzunov, 2019]. In the sub-taiga and forest-steppe areas, in the Tobol River valley, more than 70 sites with the type II pottery of the Itkul Culture have been identified, of which 46 villages are surrounded with sand ramparts up to 3–4 m wide and up to 0.5 m high, and trenches up to 1 m wide and up to 0.35–0.6 m deep, with a closed circular outline. The tendency of arrangement of the Itkul settlements closer to areas of large flow-through lakes and lake systems has been noted. The remains of above-ground buildings in the form of elevated platforms are located along the perimeter of the fortifications [Berlina, Zimina, 2020]. The cultural layer of the settlements is poor in finds; osteological material in cultural deposits formed on sandy soils does not preserve, the main category of finds — fragments of pottery. The economy of the Itkul (Iset) tribes in the Tobol River region can be described as complex, combining pastoralism, hunting, fishing and domestic production, and metalworking. The ornamentation of the Itkul pottery of type II (Iset) features horizontal lines on the neck, a double row of notches on the junction with the shoulder, interpenetrating figures or variously shaded areas on the shoulders; the pattern is completed with horizontal lines, horizontal chevrons or inclined impressions of a short stamp, etc. The necks of the vessels have thickening at the base. In the Tobol River region complexes, such vessels comprise from 45% in the sub-taiga areas to 90% in the forest-steppe. In the ornamentation technique for vessels of the Tobol River region complexes, comb stamp prevail (70–100%). For the pottery clay of Itkul ware in the Urals, the inclusion of talc and mica has been recorded [Beltikova, 2005]. In the Tobol River region complexes, the percentage of vessels with this type of admixture can vary from 25% in the sub-taiga zone [Zimina, Zakh, 2009: 181], to 46–85% in the forest-steppe complexes [Zimina, Ilyushina, 2016: 37].

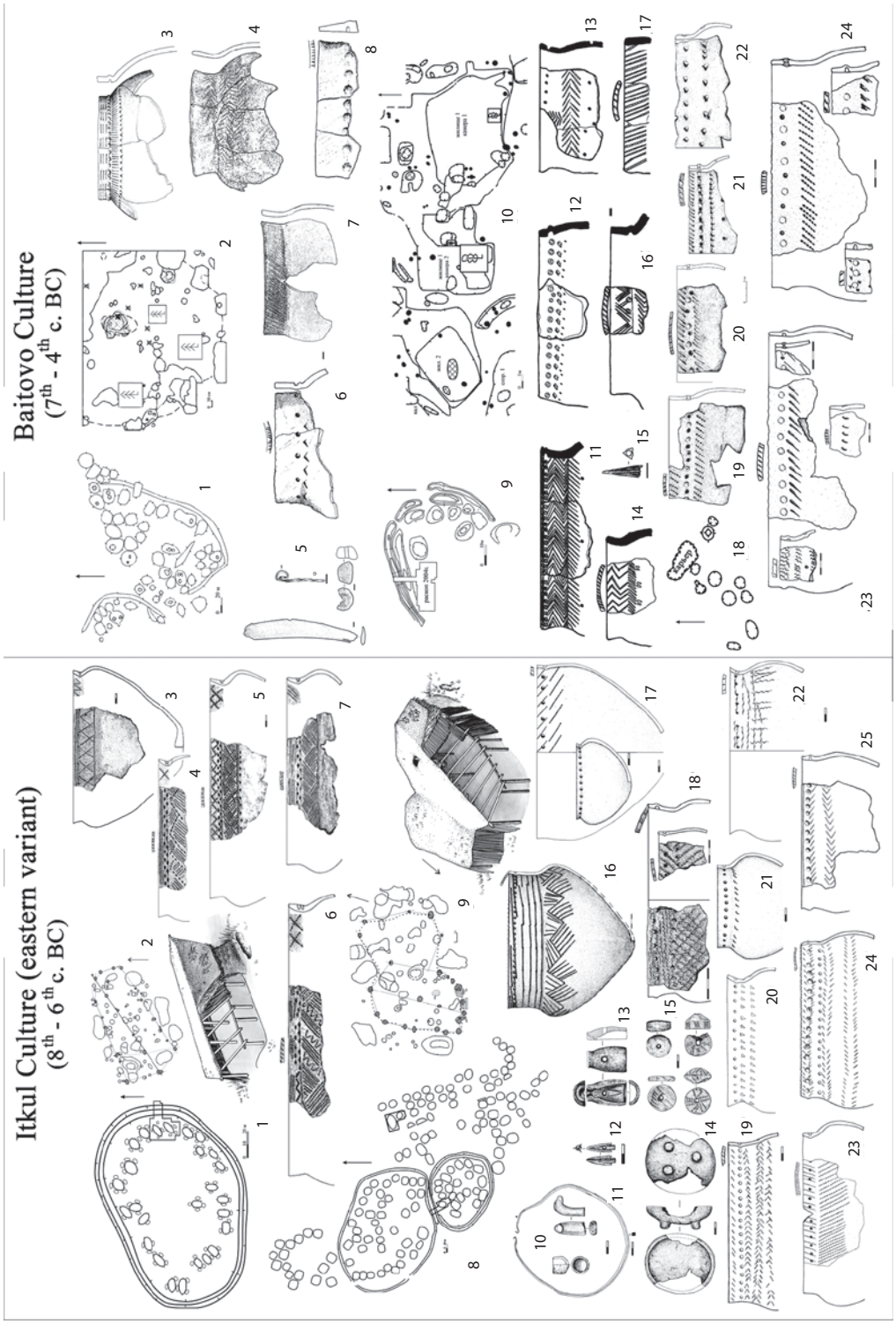
Baitovo Culture
(7th - 4th c. BC)
Itkul Culture (eastern variant)
(8th - 6th c. BC)

Fig. 3. Archaeological cultures of the transition period from the Bronze Age to the Early Iron Age in the Tobol region. Itkul culture (after [Zimina, Zakh, 2009]): 1–7 — Karagai Aul-4; 8–25 — Vak-Kur-2; Baitovskaya culture (after [Tsembalyuk et al., 2011; Matveeva, Tsembalyuk, 2010; Zimina, Tsembalyuk, 2012]): 1–8 — Borovushka-2; 9–17 — Bolshoy Imbiryai-3; 18–22 — Cheganovo-2; 23–24 — Cheganovo-3
Рис. 3. Археологические культуры переходного периода от бронзового века к раннему железному веку в Притоболье. Иткульская культура (по [Зимина, Зах, 2009]): 1–7 — Карагай Аул-4; 8–25 — Вак-Кур-2; Баитовская культура (по [Цембалюк и др., 2011; Матвеева, Цембалюк, 2010; Зимина, Цембалюк, 2012]): 1–8 — Боровушка-2; 9–17 — Большой Имбиряй-3; 18–22 — Чеганово-2; 23–24 — Чеганово-3

The Baitovo Culture (7th — 4th c. BC) highlights the initial stage of the Early Iron Age in the Trans-Ural forest-steppe and sub-taiga [Stoyanov, 1970: 252]. The core of its distribution area is located in the forest-steppe zone in the Tobol and Iset Rivers interfluve. About 200 fortified and unfortified settlements with the Baitovo materials are known [Matveeva, Tsembalyuk, 2004, p. 230]. In many multi-layered sites, the Baitovo complexes are not abundant, and they distinguish typologically. More than ten objects have been investigated by excavations [Tsembalyuk, 2017] (Fig. 3). For the Baitovo population, characteristic was the riverside type of settling, in single occasions they also settled along lake shores (Bochanetskoye, Chepkul 86). The defensive structures of the Baitovo weakly fortified hillforts have the layout of open ramparts and ditches of various shapes — broken arcs, straight lines, etc. Well fortified hillforts are hilltop or circular, with single defensive line of moat and rampart, reinforced with wooden structures (fence, palisade, wall) [Tsembalyuk, 2009]. Housebuilding of the Baitovo population features two types of frame-and-pillar buildings — above-ground ones, surrounded along the perimeter by pits-quarries or ditches, and half-dugouts — single- or two-chambered ones, 6.5 to 108 m^2 in area [Tsembalyuk, 2017: 10–11]. The analysis of palaeozoological complexes confirms, that the Baitovo population was engaged in pastoralism. The proportions of horses and cattle in the herd were almost equal, while small cattle only constituted its third. Considering the short-term residence periods of the Baitovo groups in many of the settlements, it has been assumed that the distant-pasture type of pastoralism was practiced [Tsembalyuk, 2017: 11–12]. The role of hunting and fishing in the economy of the Baitovo population was not significant. From the associated artefacts, it can be stated that the inhabitants of the Baitovo villages were also engaged in production of pottery, metal- and woodwork, leather, weaving, and other goods [Zimina, Kostomarov, Tsembalyuk, 2012]. Baitovo ware represents round-bottomed pots with an abundant inclusion of sand in the clay, poorly decorated at the top with pearls, round pits, angles, inclined and horizontal lines, horizontal "herringbone", vertical chevrons, less often — mesh, "combs", rocking, scallops. Ornaments are usually made in combing or, more rarely, drawing technique. A distinctive feature of the Baitovo pottery is decoration of the upper section of the neck with a "mesh", rows of inclined lines. To the early stage of the Baitovo Culture, dated to the end of the 7th — 6th c. BC, poorly fortified hillforts and unfortified settlements with above-ground buildings have been attributed; their pottery complexes are dominated by mildly profiled thin-walled egg-shaped vessels with short neck, simplified decoration, mainly made by the combed stamp [Tsembalyuk, 2017: 13]. The later stage (5th — beginning of the 4th c. BC) was marked by well-fortified

hillforts with one- or two-chambered half-dugouts, with pottery represented by well-profiled thick-walled ball-shaped vessels with high necks. The ornamentation of the ware shows larger proportion of carved and drawn elements, the compositional structure of the pattern becomes more complex. Furthermore, in the sub-taiga areas of the Tobol River region, a group of sites features pottery with particular characteristics which are considered to be a specific "taiga" type of the Baitovo pottery [Zimina, 2006]. It is represented by mildly profiled vessels, rather thin-walled, with less inclusion of sand, and with a specific wavy ornament.

The synthesis and systematization of materials from the Late Bronze Age sites (Mezhovka, Barkhatovo, Gamayun) of the Trans-Urals, as well as the reconstruction of the historical and cultural processes based on them, suggest that during the short period of transition to the Early Iron Age, with deteriorating natural and climatic conditions in the area, there was an intensive transformation of traditional features of the Late Bronze Age complexes of various cultures and the emergence of new single- (Baitovo) and multi-component (Itkul) cultural formations, which occupied different ecological niches. The modern source base provides a justification for the concept of historical and cultural environment at the turn of the Bronze and Iron Ages in the Trans-Urals.

The findings are based on statistical data (quantitative indicators of the pottery complexes) and qualitative indicators (type-defining characteristics of settlements, buildings, etc.) of the cultures, spatial analysis and radiocarbon dates for the settlements.

Results and discussion

Comparison on the main parameters of the discussed cultures allows outlining the basic cultural and genetic links, and mutual influence of the cultures reflected in their spatial distribution and in the material culture (outline of settlement, housebuilding, pottery production, economy).

Spatial analysis of overlapping/divergence of the distribution areas of the Trans-Ural cultures has shown, that populations of the Mezhovka and Barkhatovo Cultures were only neighbouring each other along the eastern slope of the Ural Ridge — in the outskirts of their regions. The main settlement area of the Barkhatovo Culture was the Tobol-Iset interfluve. The one of the Gamayun Culture, on the contrary, covered entirely the distribution region of the eastern Mezhovka sites [Borzunov, 1992: 26, 27, Fig. 1]. However, Gamayun pottery has not been found in the latter complexes [Obydennov, Shorin, 1995: 116]. Apparently, the Mezhovka Culture had finished its existence before the arrival of the Gamayun communities [Borzunov, 1992: 130], and, by the time of arrival of the Gamayun groups, complexes of the Itkul Culture were formed on its basis in the Urals with the type I pottery; its representatives created the Trans-Ural metallurgy centre [Beltikova, 2005]. Eastern slopes of the Urals and forest-steppe and sub-taiga areas of the Trans-Urals in the valley of the Tobol River were the main area of settlements with the Itkul ceramics of type II (Iset). The area of the Baitovo Culture overlapped with that of the Barkhatovo Culture, and it is located in the Tobol River and largely in the Tobol-Iset interfluve.

Unlike the settlements of the Mezhovka Culture, the Barkhatovo contains pottery with crossed ornaments. In the sites of the early stage of the Barkhatovo Culture (settlement sites of Schetkovo-2, Novo-Shadrino-7, Pospelovo-1) it only comprises several (no more than 50) fragments. In our view, this is indicative of only sporadic contacts between the Barkhatovo

and foreign groups. The settlements of the later stage of the Culture clearly show the presence of an external factor manifested in the presence of the Gamayun pottery, decorated with impressions of a stamped cross, conical pits and horizontal belts of "snakes" in cultural layers of the Barkhatovo hillforts. In the Krasnogorsk settlement it is not numerous (one collapsed vessel on the floor of a dwelling and 43 fragments from vessels) [Matveev, Anosko, 2009: 39–80]. In the Miassk and Ust-Utyak hillforts, Gamayun ware constitutes about 30% of the pottery complex, present are also items with mixed features [Borzunov, 1992; Epimakhov, Epimakhova, 2009: 66–70; Zimina, Zakh, 2009]. We hypothesise the coexistence of representatives of the Barkhatovo and Gamayun Cultures in these villages. The Miass settlement represents the southwestern periphery of the Barkhatovo area and it tends to be closer towards the territory of the compact location of the Gamayun groups (the Miass-Argazin variant) [Borzunov, 1992]. The hillfort of Ust-Utyak-1 is located at the southern edge of the main distribution area of the Barkhatovo Culture. Certain Gamayun groups (Andreevskoye 5 and 9 fortified settlement) were penetrating into the northern area of the Barkhatovo Culture in the sub-taiga zone of the Tobol River region. Interaction with the Gamayun communities was apparently forced for the Barkhatovo population, as it was during this time when they began to build fortified settlements on the points of high terraces of the Iset and Tobol Rivers.

The core of the Bronze Age Barkhatovo Culture area in the Tobol-Iset forest-steppe completely overlaps with the territory of the Early Iron Age Baitovo Culture sites. At the same time, in the lower reaches of Tobol, mainly in the sub-taiga zone in the interfluve of Tura and Pyshma, objects of the eastern local variant of the Itkul (Iset) Culture are concentrated. Yet, Itkul (Iset) poorly fortified settlements are also present in the zone of influence of the Baitovo Culture — in the forest-steppe of the Tobol-Iset region, where they are found in ribbon forests. As such, the inter-lane existence of the Itkul and Baitovo groups, occupying different ecological niches, has been recorded. Settlements of the Itkul Culture are arranged along the shores of large lakes and lake systems, located on sandy ridges, hills, often at a distance of watercourses. On the contrary, Baitovo sites are connected to large rivers and their tributaries. In this case, there is a direct overlapping with the Late Bronze settlement pattern of the Barkhatovo Culture, when a certain settling system most convenient for the existence was developed, clearly reflecting the tendency of building the villages in rather narrow areas along the river valleys.

Depending on the settlement pattern, the protective properties of the landscape were also considered. All the elements common for the prehistoric fortification systems have been identified in the Barkhatovo fortified settlements (Miass and Krasnogorsk hillforts): earthen ramparts and ditches [Matveev, Anoshko, 2009: 204–205]. Their small size indicates the unlikeliness of formidable barriers. Nevertheless, the fortified settlements of the final stage of the Bronze Age occupied areas of high steep shores, with further reinforcing of the rampart with a log wall on the mainland side of the cape, which enhanced their defensive ability. The appearance of fortifications in this period has been recorded not only among representatives of the Barkhatovo Culture, but also among their northern neighbours — the Gamayun population (hillforts of Andreevskoye-5 and 7, Palkinskoye, Funtusovskoye, etc.) [Borzunov, 1992: 33–41]. The differences between the Gamayun hillforts from the Barkhatovo sites are only limited to the presence on the former ones of circular defence lines on small hills and fortified isolated dwellings with double walls, a moat and a palisade, as well as the cape layout

with transverse, arc-shaped shafts-ditches. The majority of researchers link the appearance of fortresses during this period with climate change — the increase in the water level in the rivers, which resulted in movement of groups of various cultures, and subsequently the emergence of social tensions and the construction of fortifications [Kosarev, 1984: 42; and etc.].

The planning solutions for the weakly fortified settlements of the Itkul Culture differ considerably from those of the Gamayun and Barkhatovo. They are 50 to 300 m in diameter, have circular layout of defensive systems, comprising in prehistoric times a wall, only preserved as low sandy shafts, and a shallow perimeter trench. At the early stage of the Baitovo Culture, fortified settlements were surrounded with fences-palisades, installed in a shallow ditch, the soil from which was used for the mound of the rampart (Borovushka, Bochanetskoye). Already at the beginning of the Early Iron Age, at the late stage of existence of the Culture, the strength of the defence lines increased dramatically; gate towers appeared (Likhachevskoye, Bolshoy Imbiryai-3) [Tsembaluk, 2009: 58].

The comparison of the housebuilding traditions allows drawing the following succession lines. For the Late Bronze Age period, characteristic were frame-and-pillar sub-rectangular buildings, with foundation pits slightly deepened into soil, and corridor-shaped entrances of the Mezhovka (70–150 m^2 in area [Obydennov, Shorin, 1995]) and Barkhatovo (mostly 34–50 m^2 in area) Cultures. Baitovo frame-and-pillar buildings of the half-dugout type are most similar to the dwellings of the Barkhatovo Culture. Similarities between the Mezhovka and Gamayun housebuilding traditions have been recorded in the construction of above-ground dwellings. The construction of such objects became widespread in the succeeding period. Above-ground buildings in the form of raised platforms, contoured by pits-quarries or ditches along the perimeter, absolutely prevail in the Itkul settlements of the Tobol River region [Berlina, Zimina, 2020], and they are also present in the Baitovo sites [Tsembalyuk, 2017: 10–11]. Spatially, Baitovo settlements with above-ground buildings have been recorded to be more frequent in the sub-taiga areas of the lower Tobol River region; half-dugouts are more common in the forest-steppe belt.

The appearance of settlements with circular layout and above-ground buildings in the sub-taiga and forest-steppe Trans-Urals can only be related to the general tendency of the spread of weakly fortified settlements and above-ground structures. Somewhat earlier, these had already been common among the Middle Ob River region cultures — the Late Bronze Age Atlym and Barsova (12^{th}–8^{th} c. BC), and later Beloyarka and Kalinkina Cultures of the 7^{th}–4^{th} c. BC [Chemyakin, Karacharov, 2002], but there is no evidence for the migration of representatives of these cultures from the Ob River region to the Tobol River valley. In general, the comparative analysis of the Trans-Urals sites of the turn of the Bronze and Iron Ages suggests that the defensive complexes in the forest-steppe zone of the region played the role not only of residential settlements, but also of outposts, and in the sub-taiga they were most likely related to the specifics of the economy and lifestyle, or with some ideological aspects.

The analysis of the economic patterns of the communities suggests clear similarities between the Barkhatovo and Baitovo sites on the one hand, and Gamayun and Itkul on the other. Based on the materials of palaeozoological collections, the role of stockbreeding in the life-sustaining system of the Late Bronze (Barkhatovo) and succeeding Baitovo groups in the Trans-Ural forest-steppes was more important than for the Gamayun and Itkul communities.

The economy of the Barkhatovo population was based on the local-pasture meat and dairy stock farming. In the final stage of the Bronze Age, the number of small cattle in the Barkhatovo herd significantly reduced, but the proportion of horses sharply increased. This fact suggests an emerging tendency towards the increased mobility of the herd, which resulted in a change in the form and type of pastoralism at the beginning of the Early Iron Age. Researchers consider it highly probable that, in the forested areas of the Tobol River valley, the population of the Baitovo Culture practiced distant-pasture stockbreeding [Tsembalyuk, 2017: 11–13]. In the economy of the Gamayun and eastern Itkul communities, the proportion of the appropriating activities — hunting and fishing — was much higher compared to that of the Barkhatovo and Baitovo groups. It cannot be ruled out that the Gamayun population became acquainted with the farming of domesticated animals only as a result of interaction with local, Barkhatovo tribes. Representatives of the eastern local variant of the Itkul Culture, living mainly in woodlands, continued to actively use the appropriating sectors of economy, along with their supposed engagement into pastoralism [Zimina, Zakh, 2009].

Comparison of the statistical indicators for morphological and ornamental features of ceramic complexes of the turn of the Bronze and Iron Ages shows the continuity of the pottery production traditions of the earlier and later populations of the forest-steppe and sub-taiga Tans-Urals.

The Late Bronze Age cultures demonstrate close proximity of the Barkhatovo and Mezhovka pottery traditions, reflecting the period-specific originality in the ornamentation of the ware of cultures of the end of the Bronze Age. Those include the following elements of the decor: inclined lines, vertical and horizontal chevrons, mesh, shaded ribbons, triangles, diamonds, notches, knolls and grooves. The presence of "flags and pearls", as well as drop-shaped depressions and round pits, absent in the ornamentation of the Trans-Ural Mezhovka vessels, determines the originality of the Barkhatovo ceramics. At the same time, the decoration of the Mezhovka ware is defined by knolls and "collars" (14.1–27.5%), located in the mouth area of the vessel, and grooves (3–51.1%) [Stokolos, 1972, Tables 21b, 28a; Petrin, Nokhrina, Shorin, 1993, Table 15], not typical for the Barkhatovo ornamentation. The percentage of pearls on necks of the pots from the Barkhatovo hillforts constitutes 51.2–72% [Matveev, Anoshko, 2009: 312–315]. The ornaments are made in carved technique. The proportion of comb stamp patterns in the sites of the early stage of the Barkhatovo Culture does not exceed 13%, and in those of the late stage it is less than 5%. For the Mezhovka ornaments in general, carved patterns are also more characteristic, but in the northern local (Koksharovo) variant of the Mezhovka, the comb technique of ornamentation is prevailing [Shorin, 1996]. In the Mezhovka complexes, the patterns made by the comb stamp constitute 4 to 15.2% [Stokolos, 1972, Tables 21b and 28a; Petrin, Nokhrina, Shorin, 1993, Table 15].

The ornamental standards of the Mezhovka and Barkhatovo pottery complexes were formed the basis of new ornamentation traditions of cultures of the transitional time from the Bronze to the Iron Age. Mezhovka pottery traditions can be somewhat seen in ceramic materials of type I of the Itkul Culture, spread only in the mountain regions of the Southern Urals, and Barkhatovo traditions are featured in ornamental compositions of the Baitovo Culture vessels in the Tobol River region. Compared to the ornamental scheme of the Barkhatovo pottery, the Baitovo decorative compositions appear more routine, as the proportion of vertical and

horizontal chevrons is significantly reduced, and geometric patterns are virtually absent. The most common rapports of the Baitovo pottery are sloping lines, mesh, mainly made in combing technique (up to 53.1%), pearls and pits [Tsembalyuk, 2017: 13].

The comparative analysis revealed the differentiation of the Baitovo ceramic complexes of the Trans-Urals on, tentatively speaking, sub-taiga complexes of the lower Tobol River region and forest-steppe ones of the Tobol-Iset interfluve. There is less inclusion of sand in the clay of the vessels from the sub-taiga sites, while the concentration of sand in ceramics of the forest-steppe complexes is high; in the lower Tobol River region, the Baitovo ware is more thin-walled — 0.3–0.5 cm, and in the middle Tobol region — 0.5–0.7 cm; in the lower Tobol region complexes, there is a large number of weakly profiled vessels (up to 26.2%), the majority of vessels are wide-neck, the designs of the necks are variable (low straight vertical, or with a slight inclination inwards, less often slightly arched or bent); in the ornamentation of the Baitovo pottery from the lower Tobol region, a motif of alternating pits and pearls is quite common, occasionally there are wavy stamp patterns. The features of the Baitovo pottery from the lower Tobol region have direct similarities with the ornamentation of the Vak-Kur-type pottery, which developed in the lower Tobol region on the basis of the type II pottery of the Itkul (Iset) Culture, and they are absolutely not typical for the Baitovo ornamental complex [Zimina, Tsembalyuk, 2012: 34].

Ceramic materials of the eastern variant of the Itkul Culture demonstrate the result of interaction between the representatives of the Gamayun and Barkhatovo Cultures. In the Itkul pottery of type II represented by wide-neck low vessels with convex shoulders and round/small flattened bottom, the overall composition and zonality of the pattern trace back to the Gamayun ornamentation, the way of creating of the pattern is different: on the Gamayun vessels by the crossed/wavy rolled stamp, on Itkul by the combed stamp (70–100% of vessels). The ornamentation of the Itkul pottery of type II (Iset) is characterized by horizontal lines on the neck, double row of holes on the transition to the shoulder, interpenetrating figures or variously shaded areas on the shoulder; the pattern is completed with horizontal lines, horizontal chevrons or inclined impressions of a short stamp, etc. In the clay of the Itkul ware in the Urals, a mixture of talc and mica has been recorded [Beltikova, 2005]. In the Tobol region complexes, the percentage of vessels with this admixture can range from 25% in the sub-taiga zone [Zimina, Zakh, 2009: 181], to 46–85% in the forest-steppe complexes [Zimina, Ilyushina, 2016: 37]. Necks of the Itkul vessels of type II are characterized by thickening at the base — this is one of the type-defining features [Beltikova, 2005]. In the Tobol River region complexes, such vessels constitute from 45% in the sub-taiga zone to 90% in the forest-steppe [Zimina, Ilyushina, 2016]. The origin of this element is most likely related to the Barkhatovo traditions of the design of pot necks, 45% of which have similar thickening.

In the eastern variant of the Itkul (Iset) Culture, a ceramic complex of the Vak-Kur type (6th c. BC) has been identified. Its appearance is closely related to the Baitovo ware, but carries a number of characteristic decorative elements, which originate from the Itkul ornamentation of the Tobol River region (pattern in the form of impressions of wavy small-trickle stamp, several rows of horizontal lines on the neck, rows of staggered notches in the transition zone from neck to shoulder, interpenetrating figures), as well as a number of features associated with the local line of development of the pottery traditions, adopted from the Baitovo communities but originating from the Late Bronze Age traditions (elongated proportions, mild profile of

vessels, predominance of pearls in some complexes (up to 70% in the Karagai Aul 1/B fortified settlement), vertical and horizontal chevrons made by impressions of a smooth stamp, brackets and moon-shaped notches).

In general, the origins of the pottery complex of type II of the Itkul (Iset) Culture and the foreign nature of its representatives in the valley of the Tobol River has been established from a number of characteristics, which allow assuming that the region of its formation was in the eastern slopes of the Urals. A certain feature indicating the Ural origin is the inclusion of talc into the clay. This is a specific element of the Ural cultures, including both the Mezhovka and Gamayun traditions [Obydennov, Shorin, 1995: 68; Borzunov, 1992: 54]. At the same time, the principal ornamentation technique of the Itkul Culture (combed stamp) is not typical for the Barkhatovo and Gamayun pottery. For the Barkhatovo, the main ornamentation is carved [Matveev, Anosko, 2009: 249–250], and for the Gamayun — pit-crossed and pit-waved [Borzunov, 1992]. For the Mezhovka ornaments, carved patterns are also more characteristic in general, though in the northern variant of the Culture combed technique is dominant [Shorin, 1996]. The double row of pits and some elements in the form of shaded area indicate a distinct influence of the Gamayun ornamental tradition [Beltikova, 2005].

The comparative characteristics of the distribution areas, housebuilding, economy and pottery traditions of the Trans-Ural Mezhovka, Barkhatovo, Gamayun, Itkul and Baitovo Cultures show the synchronicity of the former two in the Late Bronze Age, the foreign nature of the third one in the final stage of the Bronze Age, and their transformation in the latter ones at the turn of the periods. However, the synchronicity of the stages does not imply complete coinciding of the periods during which the development of the related cultures was happening. Thus, the Mezhovka Culture ended its existence in the Trans-Urals slightly earlier than the Barkhatovo. The absence of radiocarbon dates of the Mezhovka sites and of any Gamayun ware in their ceramic complexes suggest that all of them belong to the pre-Gamayun period in the Trans-Urals. Unlike in the Cis-Urals, in this territory, the Mezhovka Culture could have ceised its existence before the end of the 9th c. BC, when the area was apparently already occupied by the Gamayun population. Radiocarbon dates, obtained from the materials of a building of the Krasnogorsk hillfort of the Barkhatovo Culture, in the foundation pit of which the fragments of both the Barkhatovo and Gamayun vessels were found, definitely indicate that the Gamayun groups appeared in the Tobol-Iset region in the late 9th — early 8th c. BC.

Materials and absolute dating of the Baitovo sites define the chronological framework of the Culture within the 7th to early 4th c. BC [Tsembalyuk, 2017: 14]. The literature has repeatedly suggested its formation on the basis of the Barkhatovo Culture. The settlement sites of Zavodoukovskoye-9 and Uk 3 can be attributed to the transitional Barkhatovo-Baitovo complexes [Matveev, Anosko, 2009: 341–342]. The pottery complex, identified in the materials of the Zavodoukovskoye-9 settlement, demonstrates the tendency towards the more poor and simple ornamental scheme of the Barkhatovo Culture, and shows the features characteristic to the pottery traditions of the Baitovo Culture: reduction of the proportion of carved ornaments (up to 48%), increase in number of notches (up to 45.2%) and elements made by a combed stamp (up to 5.5%). The provisional dating of this complex is 8th c. BC.

In the lower Tobol River region, which was the northern area of distribution of the Barkhatovo Culture, Gamayun and Itkul (Iset) groups appear in the 9th–8th c. BC. Further

development of the Itkul (Iset) Culture in the Tobol region occurred in the way of fading of its northern and Ural components and more powerful influence of the local traditions, already formed in the Late Bronze Age. This trend is reflected in the materials of the Vak-Kur stage of the Itkul (Iset) Culture (Vak-Kur-2, Karaulniy Yar-4, Yurtobor-6 and others [Zimina, Zakh, 2009]), dated to the 6th c. BC. From approximately the 5th c. BC, in the sub-taiga zone of the Tobol River region, in the area of the eastern variant of the Itkul Culture, sites with the so-called "forest Baitovo" ceramics spread, namely Kalachik-1, Yurtobor-3, 20, Cheganovo-1–4 [Zimina, Tsembalyuk, 2012: 35]. In general, the periodization of the eastern variant of the Culture reflects the dynamics of the Itkul (Iset) cultural stereotype, its gradual transformation and its replacement by the Baitovo [Zimina, Zakh, 2009: 213, Fig. 111].

Conclusions

The qualitative and quantitative data show rather dynamic transformational processes at the turn of the Bronze and Early Iron Ages, and confirm the minor presence of the taiga migrants — representative of ceramic traditions with crossed ornamentation — in the area of the Barkhatovo Culture in the forest-steppe of the Tobol River region. The chronological hiatus of the 8th and 7th c. BC is also filled by the presence of migrants, but from the eastern slopes of the Urals, who experienced the influence of the taiga cultures — the representatives of the Itkul (Iset) Culture. They shared the space of the forest-steppe — the sub-taiga zones of the Tobol River region — with the "Baitovo" communities: the Itkul dominated in the interfluve of the Tura and Pyshma Rivers (left tributaries of the Tobol River, sub-taiga), the Baitovo — in the interfluve of the Iset and Tobol Rivers (forest-steppe). In the 6th c. BC, the foreign traditions become obsolete, and a complete substitution by the local "standard" — the Baitovo — occurs for a short time before the spread of the Sargat-Gorokhov influence in the area in the 5th c. BC.

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