

Проблемы доистории и палеогеномики

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<https://doi.org/10.24852/2587-6112.2022.2.258.277>**LOCATION OF THE URALIC PROTO-LANGUAGE IN THE KAMA RIVER VALLEY AND THE URALIC SPEAKERS' EXPANSION EAST AND WEST WITH THE 'SEJMA-TURBINO TRANSCULTURAL PHENOMENON' 2200-1900 BC**

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Volgo-Kama Neolithic resulted from an expansion of the Elshan culture to Lower Kama c. 5700 BCE. Corresponding “Indo-Uralic” linguistic parallels attest to an expansion of pre-Proto-Indo-European speakers to the area of pre-Proto-Uralic speakers. This supports the evidence of linguistic palaeontology (Proto-Uralic words for ‘cembra pine’ and for ‘bee’ and ‘honey’) for the Kama River Valley as the Uralic homeland. Proto-Uralic had loanwords from pre-Proto-Indo-Iranian, whose speakers can now be traced to the Abashevo culture of 2200–2000 BCE: the Abashevo expansion from Lower Kama to the Ural-Tobol interfluvium created the Sintashta culture (2000–1900 BCE), which has the earliest archaeological evidence for horse-drawn chariots, matching Proto-Indo-Iranian chariot vocabulary. Between 2200 and 1900 BCE, the Sejma-Turbino network (ST) of warrior-smith-traders distributed high-quality weapons along the border of taiga and steppe between the Upper Ob and Finland. This long but narrow corridor matches the distribution of the intermediate proto-languages of the Uralic family. It is argued that the ST came into being when Abashevo smiths moved from Balanbash on Lower Kama to Turbino on Mid-Kama and there created the ST metal axe-celt to replace the local stone-celt. The metal axe and Abashevo-like lance-heads and other weapons were then traded west and east, to hunter-fisher-cultures of Europe and Siberia (where weapons of tin-bronze were produced), establishing Proto-Uralic as the language of the areas of ST rule.

Keywords: archaeology, Volgo-Kama Neolithic; Kama River Valley; Sejma-Turbino; Garino-Bor; Abashevo; Sintashta; chariot; Uralic; Indo-European; Indo-Iranian.

РАСПРОСТРАНЕНИЕ УРАЛЬСКОГО ПРАЯЗЫКА В ДОЛИНЕ РЕКИ КАМЫ И ЭКСПАНСИЯ НОСИТЕЛЕЙ УРАЛЬСКОГО ЯЗЫКА НА ВОСТОК И ЗАПАД СОВМЕСТНО С «ТРАНСКУЛЬТУРНЫМ СЕЙМИНСКО-ТУРБИНСКИМ ФЕНОМЕНОМ» В 2200-1900 ГГ. ДО Н.Э.

Аско Парпола

Неолит в Волго-Камском регионе возник в результате экспансии елшанской культуры в Нижнее Прикамье около 5700 г. до н.э. Соответствующие «индоуральские» лингвистические параллели свидетельствуют об экспансии носителей до-протоиндоевропейского языка на территорию носителей до-протоуральского языка. Это подтверждает сведения лингвистической палеонтологии (протоуральские слова, обозначающие «кедровую сосну», «пчелу» и «мед»), согласно которым население долины реки Камы имело уральские корни. Протоуральский язык имел заимствования из до-протоиндоиранского языка, носителей которого в настоящее время можно проследить до абашевской культуры 2200–2000 гг. до н.э.: в результате абашевской экспансии из Нижней Камы в Урало-Тобольское междуречье возникла синташтинская культура (2000–1900 гг. до н.э.), содержащая наиболее ранние археологические свидетельства появления колесниц, запряженных лошадьми, соответствующих протоиндоиранской лексике в отношении колесниц. В период между 2200 и 1900 гг. до н.э. сейминско-турбинская система воинов, кузнецов и торговцев была источником распространения высококачественного оружия вдоль границы таежной и степной зон между Верхней Обью и Финляндией. Этот длинный узкий коридор соответствует области распространения промежуточных протоязыков уральской языковой семьи. Существует мнение, что сейминско-турбинская система возникла в период, когда абашевские кузнецы мигрировали из Баланбаша на Нижней Каме в Турбино на Средней Каме, где они создали металлический кельт сейминско-турбинской системы, пришедший на смену местному каменному кельту. Впоследствии металлический топор, наконечники копий абашевского типа и другое оружие стали продаваться в западных и восточных областях носителям охотничье-рыболовческих культур

Европы и Сибири (где производилось оружие из оловянной бронзы), что сделало прауральский основным языком в подчиненных сейминско-турбинской системе областях.

Ключевые слова: археология, волго-камский неолит; долина реки Камы; сейминско-турбинская культура; гарино-борская культура; Абашево; Синташта; колесница; уральский регион; индоевропейский регион; индоиранский регион

My respected friend Sergej V. Kuz'minykh and his senior colleague Evgenij N. Chernykh are leading experts on the 'Sejma-Turbino transcultural phenomenon' (= ST) in particular, and on the archaeology of early Eurasian metallurgy in general. In this Festschrift in honour of Sergej Vladimirovich I would like to present some partly new ideas on the formation of the ST (developing further those of Carpelan & Parpola 2001), based on considerations of historical linguistics. The main thesis is that the Uralic protolanguage expanded from the Kama Valley east and west with the ST. The paper touches also the Anan'ino and Akozino-Akhmylovo centres of metal production, which likewise figure prominently within Sergej's extensive and meticulous work.

J. P. Mallory started his epoch-making study *In search of the Indo-Europeans* (1989) by tracing backwards in time the origins of the different branches of the Indo-European (IE) language family as far as the sources allow, before attempting to find the archaeological culture of Proto-Indo-European (PIE) speakers from which all the IE branches could be derived. This eventually led to Mallory's identifying the North Pontic and Volga steppes of the Copper and Early Bronze Age (5500-2500 BC, Mallory 1989: 186-221, 262) as the (Pre-)PIE homeland, with the **Yamnaya (Pit Grave) culture** (3600-2200 BCE) [3350-2450 cal BCE in Molodin & al. 2014] as its final phase (Mallory 1989: 210-211). After the great breakthrough in the analysis of ancient DNA, archaeo-genetics has confirmed Mallory's solution. It could be shown that people with the R1a/R1b haplogroup have migrated from the Yamnaya culture to areas in Europe and Asia where IE languages have been subsequently spoken (Haak & al. 2015; Allentoft & al. 2015).

Following Mallory's methodology, Janne Saarikivi (2022) has attempted to locate and date the intermediate protolanguages of the Uralic language family "purely on a linguistic basis by investigating their language contacts, especially the layers of lexical borrowings, as well as areal linguistic variation, palaeolinguistic characteristics, and layers of toponymy" (p. 28). The estimated dates of the intermediate protolanguages vary from 1000-500 BC (Finnic) to 0 (Samoyedic), 0-500 CE (Saami), 700 CE

(Permic), 900 CE (Hungarian), 1100-1500 CE (Mordvinic, Mari), 1500 CE (Khanty, Mansi). Locationwise Saarikivi summarizes his main results in the map reproduced here as **Fig. 1**. As Saarikivi observes, the original locations form a chain along the southern edge of the forest zone, which thus delineates the likely spread route of Proto-Uralic. Saarikivi's conclusion agrees with the earlier proposal of this hypothesis by Tapani Salminen (1999: 20-21). Christian Carpelan (1999: 270) has noted that the southern edge of the taiga zone is more or less the route along which the ST bronzes are distributed (**Fig. 2**), and Petri Kallio (2006: 16) has found it hardly coincidental that the Uralic languages and the ST bronzes have exactly the same spread along a very narrow and very long corridor stretching from Samoyed to Finnic and from Yenisei/Ob in Siberia to Finland. The two expansions involved coincide also temporally: the operation of the ST network has been dated 2200-1900 calBC (Marchenko & al. 2017; 2150-1500 calBC Chernykh & al. 2017: 45, taking into account later variants), and, as will be seen, this agrees well with the time that can be proposed for the disintegration of Proto-Uralic.

On the basis of the typological similarity between Uralic and Altaic languages, M. A. Castrén (1849) placed the Proto-Uralic homeland in western Siberia. Among the present-day authorities, so thinks also Juha Janhunen (2009). Even though this location does not fit other evidence related to Proto-Uralic, the early ancestor of Proto-Uralic is likely to have come from Siberia.

The vocabulary that can be reconstructed to the Proto-Uralic language reflects a sub-Neolithic culture of hunter-gatherer-fishers living in northern forest environment (K. Häkkinen 2001; Aikio 2022). This matches the overall present distribution of the members of this language family, from Fenno-Scandia and the Baltics over the northern parts of European Russia to western Siberia, the isolated Hungarian having the central Urals as its original homestead. The traditional favourite for the Proto-Uralic homeland has been the basin of the Kama River just west of the Ural Mountains. The Kama Valley is approximately in the middle of the distribution continuum of the Uralic languages. A more western location

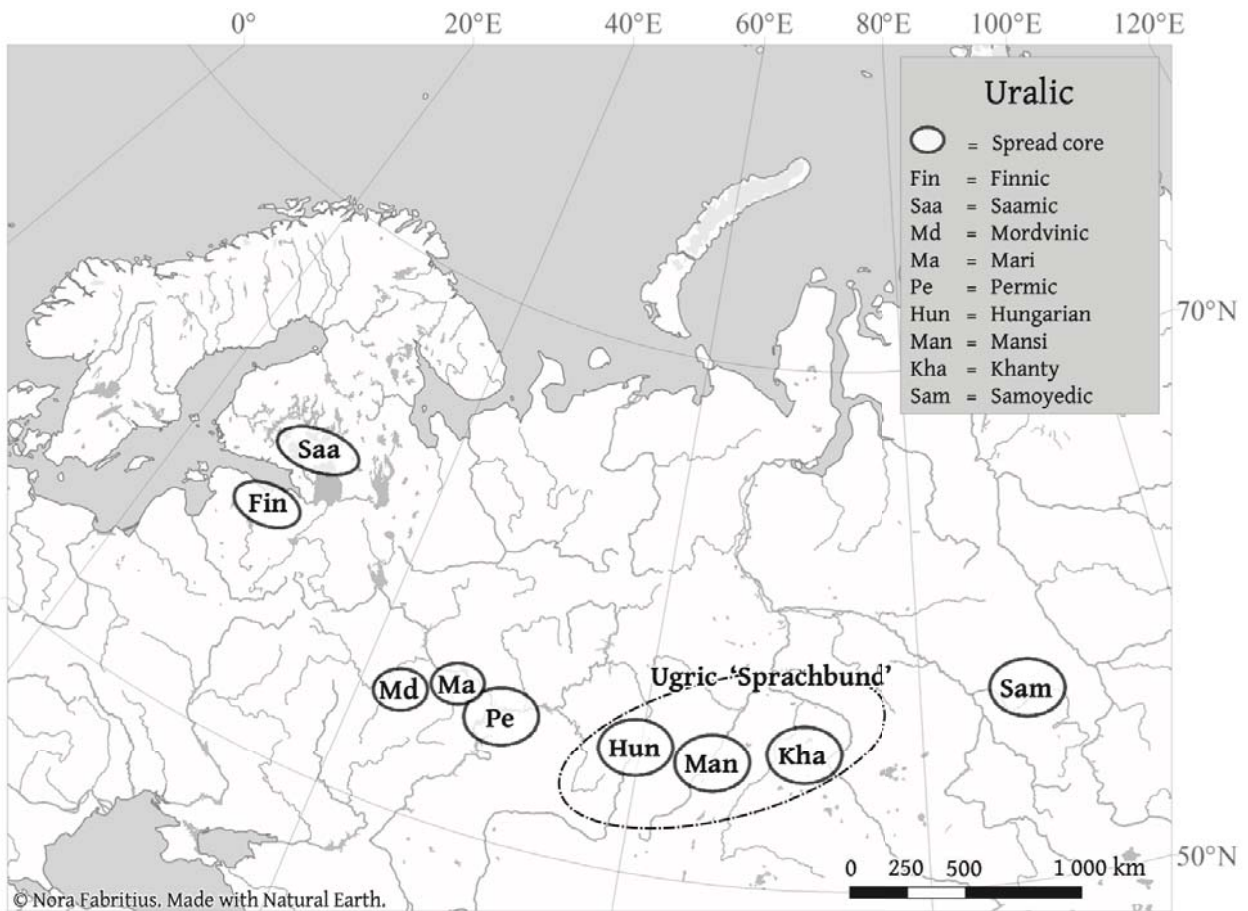


Fig. 1. The areas of intermediate Uralic protolanguages. After Saarikivi 2022: 55 map 2.8.

Рис. 1. Ареалы промежуточных уральских протоязыков. По: Саарикиви, 2022: 55, карта 2.8.

on the Upper Volga region (favoured by Finnish archaeologists since 1980, accepted in Carpelan & Parpola 2001: 78-82, but rejected in Parpola 2012: 144-150) is contradicted by the Proto-Uralic tree vocabulary, in particular the word for the cembra pine (*Pinus sibirica*), **siksa* in Proto-Uralic: this tree grows widely in Siberia, but on the European side of the Urals not further west than the Kama Valley (J. Häkkinen 2009: 35-37; Aikio 2022). On the other hand, the Pre-Proto-Indo-Iranian (Pre-PIIr) loanwords **meti* 'honey' and **mekši* 'bee' reconstructed to Proto-Uralic (Aikio 2022) exclude Siberia, where the honeybee was not found until the 1770s (Köppen 1890; Carpelan & Parpola 2001: 114-122).

An important support to the Kama Valley as the Proto-Uralic homeland is given by the very early contact between Uralic and Indo-European language families, which some scholars have taken as evidence for "Indo-Uralic" genetic relationship. In a recent critical survey, Martin Kümmel (2015, p. 8-9) singles out significant parallels in personal pronouns, three different demonstrative pronouns, two interrogative pronouns, one relative pronoun, suffixes of dual, plural, accusative, ablative and instrumental,

and 19 lexical comparisons. The hypothesis of a common descent from an earlier "Indo-Uralic" language seems improbable for typological reasons:

"To summarize the typological relationship of Uralic and Indo-European we may note, first, that at the earliest reconstructable level of pre-protolanguages the two genetic units were typologically almost as different as they could possibly be. This discrepancy was still more or less unaltered at the level of protolanguages, reconstructable from the comparative evidence within each family, and it has only continued to grow in some geographical areas. In the most active contact zone, however, some languages of the two families have become more similar, with typological traits infiltrating in both directions." (Janhunen 2001, p. 211)

Mallory starts his archaeological genealogy of the Indo-European language family from the Chalcolithic **Samara culture** (5500-5000 BCE) in the basin of the Samara river (which flows into the Volga near the Russian city of Samara). The "Indo-Uralic" linguistic parallels were one reason leading Mallory to this choice:

"The distinctive shell-tempered Samara ceramics are known on other sites throughout this

region and, according to Igor Vasiliev, ceramically influenced the forest cultures to the north. This provides a point of mutual contact between a segment of what we presume to have been Proto-Indo-European speakers and the region most often favoured as the probable homeland of the Uralic languages.” (Mallory 1989: 206-207).

The Neolithic **Elshan(ka) culture** (6500-5500 BCE), from which the Samara culture descended, expanded northwards to the forest zone, where the resulting **Volga-Kama culture** (5700-5500 BCE) has the oldest ceramics of the region extending from the confluence of the Volga and Kama to the Upper Kama valley (**Fig. 3**). (Krizhevskaya 1996; Vasil'ev & Vybornov 1998; Vybornov & Vasil'eva 2013; Lychagina 2013; 2014; 2018; Lychagina & Tsygvintseva 2013.) The formation of the Volga-Kama culture is likely to reflect immigration of a group of Pre-PIE speakers to the area of Pre-Proto-Uralic speakers and accommodation of the newcomers in the elite ranks of the resulting initially bilingual society. The formation of the Volga-Kama culture would thus date and locate the “Indo-Uralic” linguistic parallels (Pärpola, 2022). Proto-Uralic **pata* ‘pot’ may refer to this oldest ceramic of the Kama region: it could go back to Pre-PIE **pādā-* > PIE **poto-* > Lithuanian *puodas*, Proto-Germanic **fata* (Kallio, 2006: 4-6). The Volga-Kama culture would thus reflect the earliest linguistically reachable phase of the Uralic language family, Pre-Proto-Uralic. Its date in the sixth millennium BC is not far from 4000 BC that used to be the common estimate for the date of Proto-Uralic still fairly recently (Kallio, 2006: 2-3).

In his seminal paper of 2006, Petri Kallio pointed out that the early Indo-Iranian (or Aryan) loanwords, which can be reconstructed to Proto-Uralic (or Proto-Finno-Ugrian, which Aikio [2022] in the present situation of no well-argued family tree for practical reasons accepts to be “essentially synonymous with Proto-Uralic”) have gone through the same phonological changes in the daughter languages as other words reconstructed to Proto-Uralic (for the historical phonology of the Uralic languages, see Sammallahti 1988). Most of the Aryan loanwords in Uralic languages are later borrowings from the Iranian branch, datable to different periods. However, there are some very early loans. Sampsa Holopainen in his dissertation *Indo-Iranian borrowings in Uralic: Critical overview of the sound substitutions and distribution criterion* (2019) distinguishes as the two earliest categories of Aryan loanwords in Uralic languages (1) those from Pre-Proto-Indo-Iranian, and (2) those from Proto-Indo-Iranian

(PIIr). The following are examples of the first group:

PU **ertä* ‘side’ < (H) *érdho-* > OIA (Old Indo-Aryan) *árdha-* ‘side, half’ (p. 81)

PU **kečrā* ‘spindle’ < **ketstro-* > PIIr **čatstra-* > OIA *cā(t)tra-*, *cattrā-* (p. 116)

PU (preserved in Saami & Finnic only) **kekrā* ‘circular thing, cycle’ < **kekro-* > PIIr **čakra-* > OIA *cakra-* ‘wheel, cycle’ (p. 118)

PU **mekši* ‘bee’ < **mekš-* > PIIr **makš-* (p. 139) > OIA *makṣ-* ‘bee, fly’

PU **meti* ‘honey’ < (PIE or Pre-PIIr) **médhū-* > PIIr *mádhu-* > OIA *mádhu-* (p. 146)

PU **rečmä* ‘rope’ < *Hrečmi-* > PIIr *Hračmi-* > OIA *rašmi-* (p. 207)

It is now possible to date and locate the Proto-Indo-Iranian homeland by means of archaeology. The **Sintashta culture** (dated 2010-1770 calBC, Molodin & al. 2014), concentrated to the Ural-Tobol interfluvium (Fig. 2), had twenty-three fortified settlements surrounded by an earthen wall and a moat, the best known sites being Sintashta, Arkaim, Krivoe Ozero, Kamennyj Ambar and Ust'e-I (Zdanovich & Batanina 2007). A few Sintashta culture settlements are found also immediately to the southwest of the Ural-Tobol interfluvium, in the neighbourhood of the city of Orenburg (Tkachev 2007). The walls of the fortified settlements are usually formed in a circle about 150 metres in diameter, defending houses that taper inwards so as to create the impression of a spoked wheel. At Sintashta there are two concentric defense lines and between them rectangular houses half sunken into the ground, most of them with metallurgical furnaces. There are several cemeteries near the settlements; at Sintashta one cemetery contained 40 graves. The burials under kurgans have wooden rooms, where chiefs were placed with their weapons, a chariot with two spoked wheels (usually one meter in diameter and ten spokes connecting the rim to the hub) and a pair of horses (or just wheels and horse skulls on the principle of *pars pro toto*), plentiful animal offerings, pottery and other grave goods, as well as fireplaces. (On the Sintashta and its horse-chariots culture, see Gening & al. 1992; Parzinger 2006: 246-262; Epimakhov & Korjakova 2004; Koryakova & Epimakhov 2007: 66-81; Zdanovich & Batanina 2007; Anthony 2007: 389-411; 2009; Anthony & Vinogradov 1995; Epimakhov 2002; Vinogradov 2003; Vinogradov & al. 2010; Krause & al. 2010; Vinogradov & Epimakhov 2013.)

Alexander Lubotsky (in press) has reconstructed the Proto-Indo-Iranian terminology related to chariot, comprising terms attested

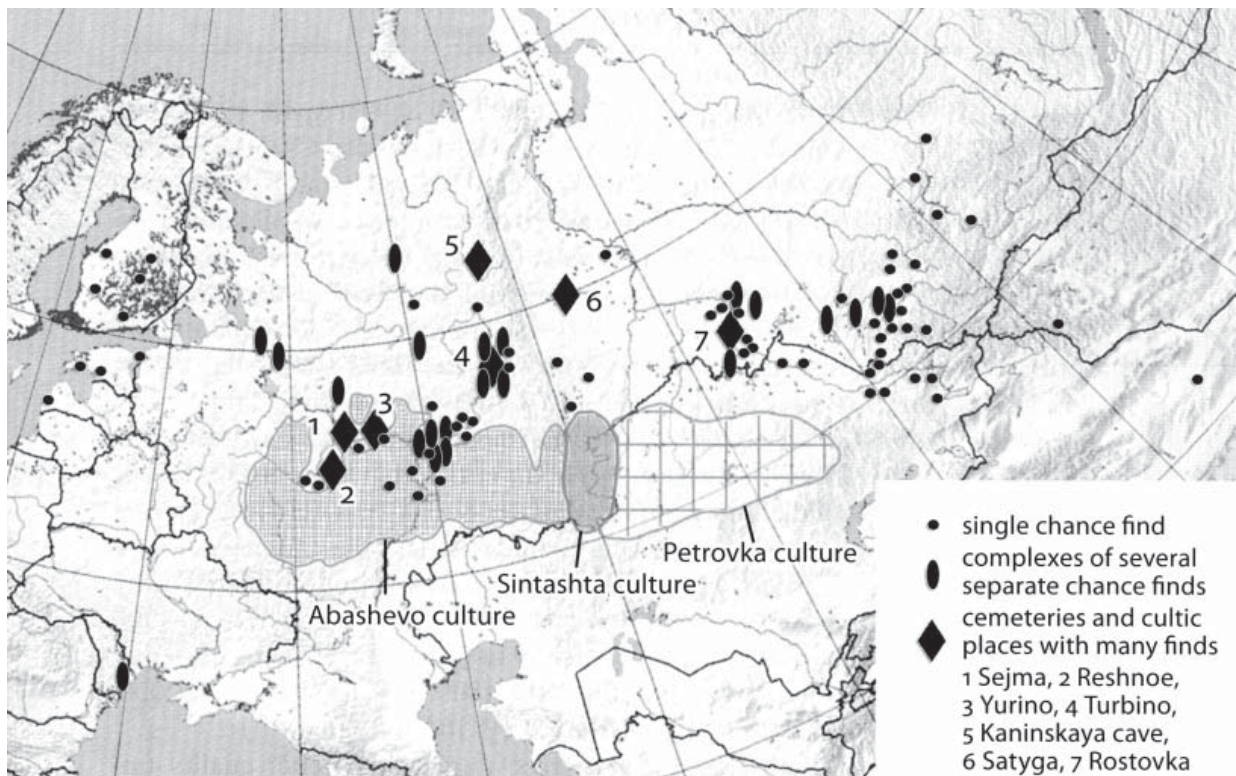


Fig. 2. Find places of the Sejma/Turbino network, along with the locations of the Abashevo, Sintashta and Petrovka cultures. After: Chernykh, 2007: 77, as modified in Parpola 2012: 157 fig. 8.

Рис. 2. Места находки предметов, относящихся к сейминской-турбинской системе, и местонахождения абашевской, синташтинской и петровской культур. По: Черных, 2007: 77, в редакции Парпола, 2012: 157, рис. 8.

in both the Indo-Aryan branch and the Iranian branch.

“Indo-Aryan and Iranian share the same word for the battle chariot, which can be reconstructed for PIIr. as **HratHa-* (Skt. *rātha-*, YAv. *raθa-*, Khot. *rraha-*, etc.). This word is identical with one of the two IE words for ‘wheel’ [...] We further have common PIIr. terms for ‘charioteer’, **HratHiH-* (Skt. *rathī-*, OAv. *raiθī-*), and for ‘chariot-fighter’, lit. ‘standing on the chariot’, **HratHai-štaH-* (Skt. *rathe-ṣṭha-*, YAv. *raθaē-štā-*). [...] It follows that the Indo-Iranians knew the chariot and that they coined the names for the charioteer and the warrior / chariot-fighter, which means that they undoubtedly used the chariots for warfare already in the PIIr. times. [...] it seems reasonable to conclude that the Indo-Iranians did not stay together for a long time after the discovery of the battle chariot. Since the earliest true chariots known are from around 2.000 BCE, the split must have taken place relatively soon after” (Lubotsky, in press)

The split of Proto-Indo-Iranian can be connected with the formation, around 1900 BCE, of the Proto-Indo-Aryan-related Andronovo cultures (Petrovka, Alakul’ and Fëdorovo) in the Asiatic steppes and the Proto-Iranian-related Srubnaya (Timber Grave) cultures in the

European steppes (for more details, see Parpola 2022).

The Sintashta culture came into being when the **Abashevo culture** (Fig. 2) spread southwards from the valleys of lower Kama and Belaya to the Ural-Tobol interfluvium (Epimakhov 2020). Until then, the Ural-Tobol interfluvium was occupied by the Poltavka culture (2600-2300 calBC), the last phase of the Yamnaya culture in the Volga-Ural area (Morgunova & Khokhlova 2013). The Abashevo culture, currently dated to 2200-1800 calBC (Molodin & al. 2014), is therefore most likely to have had Pre-Proto-Indo-Iranian as its language, and to be the source of the earliest Aryan loanwords in Proto-Uralic. Some scholars like E. E. Kuz'mina, Olga V. Kuz'mina and David Anthony have counted the Abashevo culture among the Corded Ware cultures, or derive it from the Fat'yanovo-Balanovo culture (dated 2900-2050 calBC, Saag & al. 2020; cf. Nordqvist & Heyd 2020: 5); in this case, the language spoken in the Abashevo culture would have been (Pre-)Proto-Balto-Slavic. However, while the Fat'yanovo-Balanovo burials are in flat graves (Koryakova & Epimakhov 2007: 100-102), the Abashevo culture preserves the Yamnaya tradition of kurgan burials suggesting an Aryan language (Carpelan & Parpola 2001: 93-95).

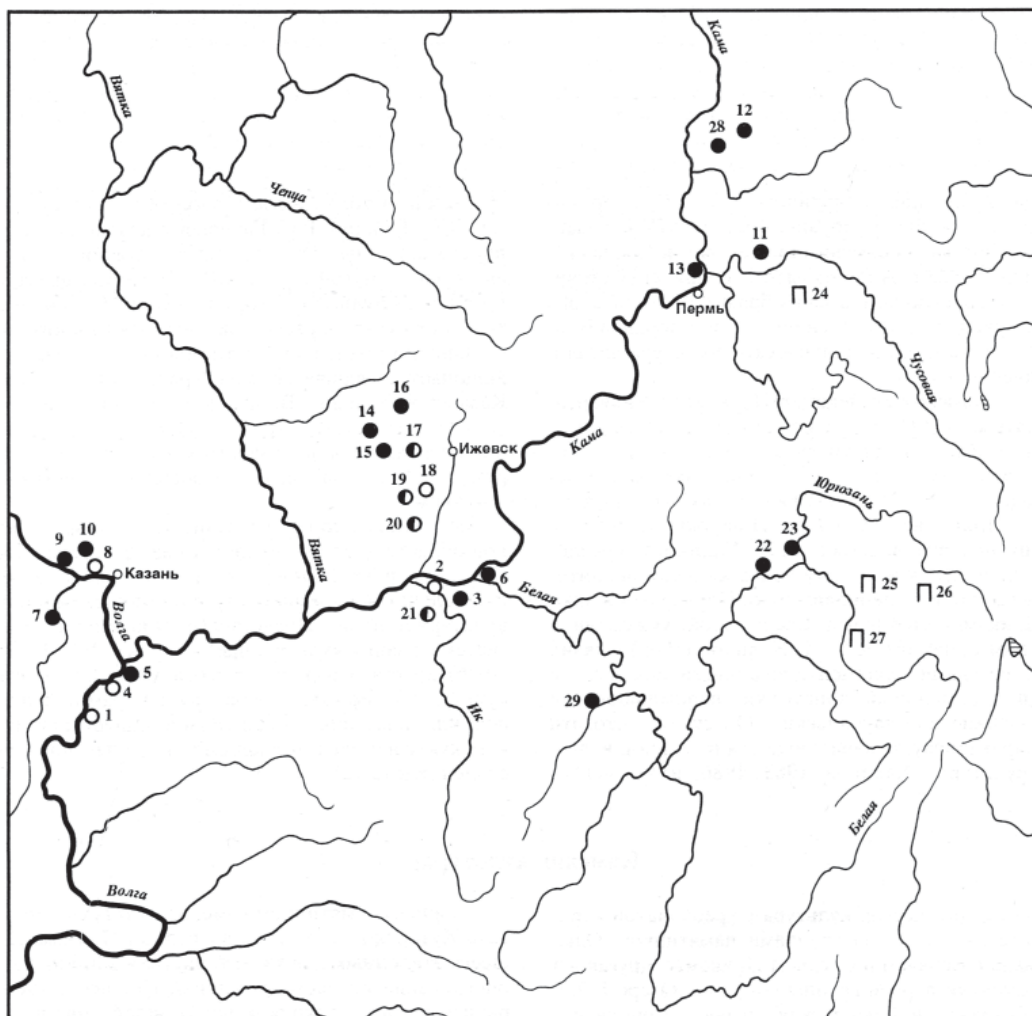


Fig. 3. Sites of Kama (black circles) and Volgo-Kama (white circles) Neolithic cultures, and sites with the two mixed (circles with black & white). п = petroglyphs. After: Krizhevskaya, 1996: 244 map 12.

Рис. 3. Памятники камской (черные кружки) и волго-камской (белые кружки) неолитических культур и памятники смешанной культурной принадлежности (черно-белые кружки). п = петроглифы.

По: Крижевская, 1996: 244, карта 12.

The Abashevo culture succeeded the Late Yamnaya/Poltavka culture of the Upper Don-Volga-Ural steppes around 2300-2200. Metal sickles and stone querns testify to the existence of agriculture. The main means of subsistence was animal husbandry; almost all the bone finds belong to domesticated animals: cattle, sheep, goats and small numbers of horses and pigs. (Pryakhin & Khalikov 1987; Chernykh 1992: 192, 196, 200-204; O. V. Kuz'mina ed. 2003; Koryakova & Epimakhov 2007: 57-66).

The northward expansion of the Abashevo culture took place at a time of increased warfare and intense development of metallurgy to make effective weapons. The Upper Don area is "in an ore-less zone and used metal imported from the Urals" (Chernykh 1992: 201), and "it was probably the quest for metal that motivated the Abashevo expansion" (Carpelan & Parpola 2001: 95). In the Mid-Volga region between the

confluences of the Oka and Kama, the Abashevo people came to conflict with the Fat'yanovo and Balanovo people who had previously settled there and controlled the copper deposits. At the confluence of the Sura and Volga rivers, the kurgan of Pepkino (dated on the basis of 9 samples to 2140-1930 calBC [68.2% likelihood], Chernykh & al. 2017: 45) contained an eleven meters long grave pit with 28 young men, all with some injury, some decapitated, some with their skulls pierced with metal axes and stone arrowheads of the Balanovo type, while the grave goods contained Abashevo pottery and a two-part mould for making a shaft-hole axe, a crucible for smelting copper and other smithing artifacts (Khalikov & al. 1966; Chernykh 1992: 201; Anthony 2007: 383-4; Koryakova & Epimakhov 2007: 62-64 with fig. 2.10).

The Abashevo occupation of the Mid-Volga region led to its coexistence and gradual

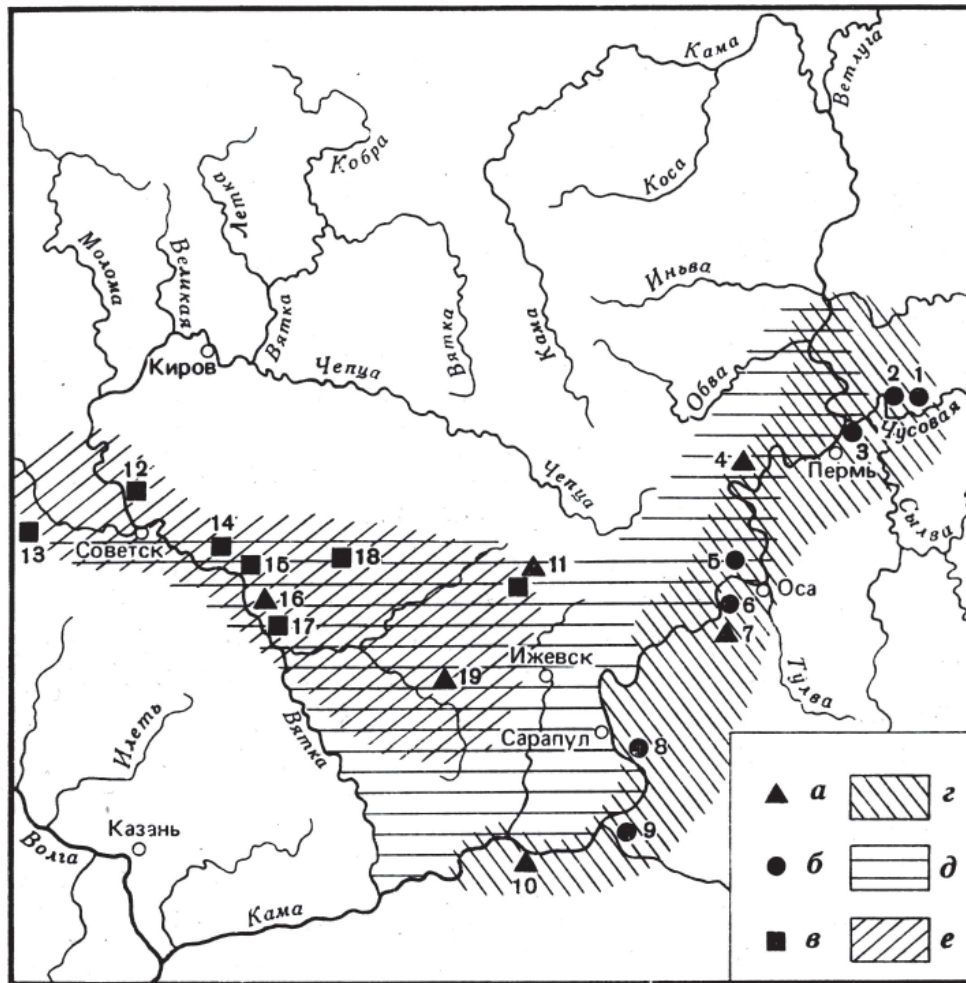


Fig. 4. Sites and areas of the Novo-II'inskaya (а, г), Garino-Bor (б, д) and Yurtik (в, е) cultures in the area of the Kama-Vyatka rivers. After: Nagovitsin, 1987: 29 map 1.

Рис. 4. Памятники и ареалы новоильинской (а, г), гарино-борской (б, д) и юртиковской (в, д) культур в районе рек Кама и Вятка. По: Наговицын, 1987: 29, карта 1.

assimilation of the Fat'yanovo-Balanovo culture, reflected in similarity of metal objects, especially in the axe form. Study of ancient DNA has confirmed the assimilation of the Fat'yanovo-Balanovo population into the Abashevo population. The 24 analysed Fat'yanovo-Balanovo people had the paternal lineage (chrY hg R1a-M417) characteristic of Corded Ware Culture individuals elsewhere in Europe.

“Interestingly, in all individuals for which the chrY hg could be determined with more depth (n=6), it was R1a2-Z93 (Table 1, Supplementary Data 2), a lineage now spread in Central and South Asia, rather than the R1a1-Z283 lineage that is common in Europe” (Saag & al. 2020).

The spread of this genetic group to Central and South Asia must have taken place via the people of the Abashevo culture and its successors, the Sintashta, Petrovka and Andronovo and Srubnaya cultures, which is yet another confirmation of

the Indo-Iranian linguistic affinity of these last mentioned cultures. The Abashevo-Fatyanovo/Balanovo coexistence in the Mid-Volga area is the most likely context from which derive the linguistic isoglosses between Balto-Slavic and Indo-Iranian, such as the RUKI-rule.

The most important metalworking focus of the Abashevo culture was in Baskiria, the area around the confluence of the Lower Kama and Belaya, where Balanbash was a specialized metallurgists' settlement. Besides the local copper-bearing sandstones, the smiths used ore from the copper-arsenic Tash-Kazgan deposit on the Upper Ui River in Trans-Urals and other sources. Eventually the Abashevo people crossed the Urals and moved further south to the Ural-Tobol interfluvium, where even richer metal deposits were available, thus creating the Sintashta culture.

The Abashevo occupation of the Lower Kama and Belaya Valleys in 2200-1900 BCE meant

neighbourhood with the **Garino-Bor culture** (c. 3000-1900 BC, Morgonova 2010) in the Valleys of Kama and Vyatka, and the Yurtik culture of the Vyatka Valley (**Fig. 4**). These had developed from the preceding Eneolithic **Novoil'in culture** (c. 4000-3500 BC, Lychagina & al. 2019), which in turn descended from the Volga-Kama Neolithic mentioned earlier in connection with the "Indo-Uralic" linguistic contacts. (Bader & Oborin 1958; Nagovitsin 1987; Korolev 2012)

About 120 habitation sites and cemeteries of the Garino-Bor culture have been recorded, about 90 of them excavated. They represent an earlier Garin period (named after the type site near Gari) and a later Bor period (after sites at Bor). The people were hunting, fishing and gathering, and lived in small villages that consisted of a few rectangular houses half sunken in the ground, often interconnected by covered corridors. Major concentrations of settlements are around Perm on Mid-Kama at its confluence with Chusovaya, and another in the more southern Osa region. Stone tools essentially continue those of the preceding Neolithic period. Metal tools have been mainly found in graves. Otto N. Bader (1961, 1964) spoke about "Turbino culture" in the sense of Garino-Bor culture; this latter term was adopted by Chernykh (1970) in order to avoid confusion with the Sejma-Turbino network. Marija Gimbutas used the term "Turbino culture" to include many other cultures of the forest zone up to Sejma on Mid-Volga. (Bader 1961; 1964; Gimbutas 1965: 611-647; Sulimirski 1970: 249-52; Nagovitsin 1987).

Chernykh and Kuz'minykh (1987, 1989) have published two major studies of the ST (the latter monograph was republished in 2010 in Beijing in a Chinese translation, which additionally discusses the ST influence on Chinese metallurgy). Sergej Kuz'minykh published in 2011 a supplementary article reviewing the substantial new material that had accumulated in the meantime: several new cemeteries including Ust'-Vetluga and Biss-2 in eastern Europe and Satyga and Tatarka in West Siberia; and the metallurgists' sanctuary on an island of the 'Satan's Lake' (Shaitanskoe ozero) near Ekaterinburg in Mid-Urals (published now in Korochkova & al. 2020). The new finds comprise 180 metal finds and 5 moulds of the Sejma-Turbino types, and over 200 metal finds and 12 moulds of the Samus'-Kizhirovo types. The last-mentioned types represent a later development restricted to West Siberia and NW Europe (Biss-2) — the massive new finds of this type come mainly from the sanctuary of Shaitanskoe ozero. In recent supplementary article, Sergej Kuz'minykh (2019)

has updated the situation with a map of the find places of the bronzes and casting moulds of the ST and Samus'-Kizhirovo types, and a discussion and illustrations of the new finds of later ST-like weapons from Xinjiang. The later developments of the ST tradition, which also include bronzes from Mongolia and China, recently studied by Grigor'ev (2021), fall outside the scope of the present paper.

The scope and extent of the studies by Chernykh and Kuz'minykh may be illustrated by the English chapter headings of their book, which comprises 320 pages, 110 illustrations (maps and drawings of artifacts), and a 35-page catalogue of the artifacts including their metallurgical analyses.

"Introduction. The cemeteries and their groups. Typology of the Seyma-Turbino metallic inventory. The casting moulds and metal of the Samus'-Kizhirovo type. Chemical composition of the bronzes and problem of the ore sources. Asian and European metal working zones. Interconnections system within Seyma-Turbino area. The western zone: Seyma-Turbino sites and European cultures. The eastern zone: Genesis of the Seyma-Turbino phenomenon. Chronology. Seyma-Turbino transcultural phenomenon and the Eurasian Metallurgical Province. Indexes (Register of archaeological sites and spectral analyses). Resume". (Chernykh & Kuz'minykh 1989: 319-320)

In the short English resumé (1989: 314) the authors underline the following facts and conclusions. The ST consists of closely related cultural groups of the forest and forest steppe zones extending from Altai to East Baltics, concentrated in five more or less large cemeteries — Sejma, Reshnoe and Turbino west of the Urals, and Rostovka and Satyga east of the Urals; in addition, there are 15 small or destroyed cemeteries in the whole area. The mobile ST tribes were not so numerous: just about 450 bronze artifacts and 30 casting moulds are known from an area of three million square kilometers. The artifacts are splendid weapons: axe celts, spearheads, and daggers decorated with impressive sculptures on the handles, knives, etc. ST has used a new casting technology producing closed shaft holes with thin walls. The metallurgists have used for the first time in northern Eurasia high quality tin-bronze. It was unexpected that this highly developed metallurgy emerged in Altai, where the earlier metal production was very primitive. The creators of the ST phenomenon were metallurgists and horse breeders of the Altai region (the socially dominant

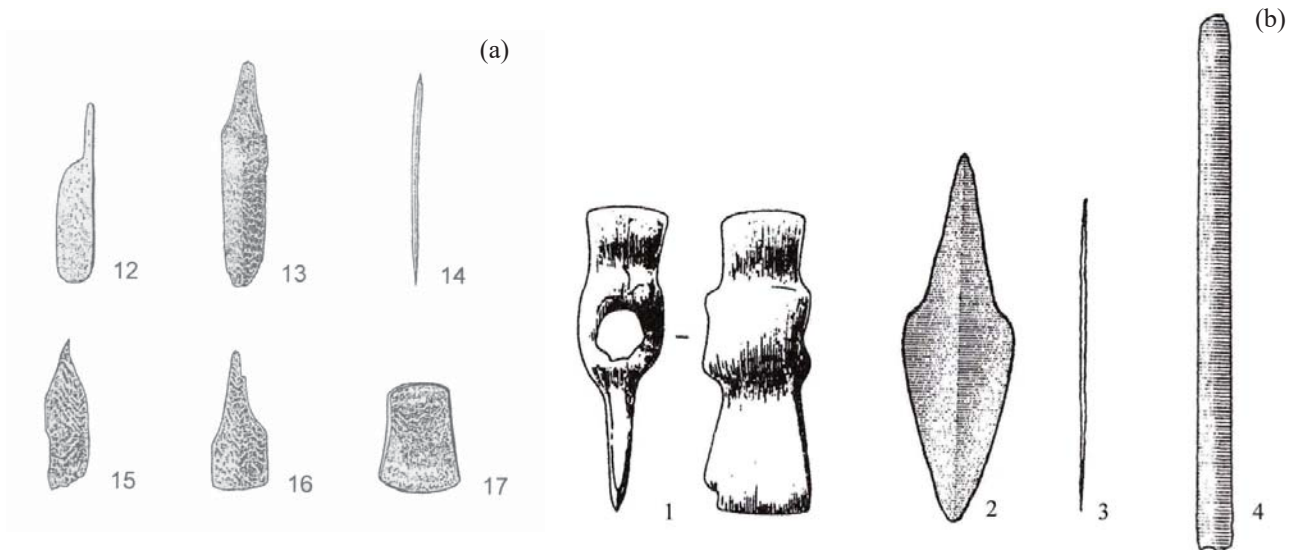


Fig. 5. (a) Metal objects of the Afanas'ev culture. After: Parzinger, 2006: 188 Abb. 56: 12-17.

(b) Metal grave goods in Okunevo culture burials in the Minusinsk Basin. After: Gass, 2011: Tafel 113: 1-4.

Рис. 5. (a) Металлические предметы афанасьевской культуры. По: Парцингер, 2006: 188 Абб. 56: 12-17.

(б) Металлический инвентарь в погребениях окуневской культуры Минусинской котловины.

По: Гасс, 2011: Тафель 113: 1-4.

group) on the one hand, and the hunter-fishers of the forest zone of the Upper Yenisei and Baikal Lake regions, who contributed the flint, bone and nephrite objects found in ST graves. These united groups moved with extreme impetuosity towards the northwest, crossing the West Siberian taiga and the Ural mountains, where they met native cultural groups with their distinctive metallurgy, in particular the Abashevo people, whom they incorporated in the ST network, which meant receipt of arsenical copper and silver melted from ores in Trans-Urals.

Chernykh (1992: 215-234) has given a much more detailed summary. He repeats the thesis that the ST metallurgy has its origin in the metallurgy of the Afanas'ev and Okunevo cultures. The graves of the **Afnas'ev culture**, however, contain very few metal objects: small beads of simple form, most of them made of pure copper, some of silver and gold (Chernykh 1992: 183); Parzinger (2006: 187-188 Abb. 56: 12-17, here **Fig. 5a**) further records awls (fig. 5a: 14), simple knives (fig. 5a: 12, 15-1&) and daggers (fig 5a: 13) with a tongue for handle, and a flat axe (fig. 5a: 17), the first of its kind. The Afanas'ev culture ceased to exist before the ST network started to operate in 2200 BC: the current radiocarbon dates for the Afanas'ev culture are 3700-2600 calBC in Russian Altai, 3000-2500 calBC in Mongolian Altai, and 2900-2500 calBC in the Minusinsk Basin (Molodin & al. 2014).

The Afanas'ev culture was succeeded by the **Okunevo culture**, which is contemporary with the ST network: it is dated 2200-1900

calBC (Molodin & al. 2014: 145). The Okunevo people did not come from somewhere else, as has been supposed: recent genetic research has shown that they were earlier local inhabitants (Kozintsev 2020). The inventory of its metal objects of 'pure' copper is restricted to few object categories. Anton Gass has recorded the grave goods from about 440 Okunevo burials in the Minusinsk Basin; his summary of the copper or bronze finds consists of the following objects: 29 awls of Afanas'ev type, square in section and c. 13 cm long (**Fig. 5b: 3**); 19 needle boxes with metal needles (Fig. 5b: 4); 44 knives, mostly from women's graves, again mostly of Afanas'ev type: they often have two blades and simple wooden or antler handles, between 17 and 4 cm long (Fig. 5b: 2); 1 fishing hook; 1 copper nail 1,5 cm long; 8 rectangular, square or round plates with the average size 4.3 x 2.2 cm; and 1 cast copper axe with a shaft-hole, total length 10,5 cm, placed on the left hip of a grown-up man (fig. 5b:1) (Gass 2011:52-55 & Tafel 113). This more or less agrees with the inventory of Okunevo metal artifacts of Chernykh (1992: 184 fig. 65), which additionally contains simple bracelets and the unique find of a cast spearhead from a late Okunevo burial at Moiseikha. The Okunevo metal objects are both of 'pure' copper and of tin-bronze, the latter considered to be the oldest in northern Asia and seen as the source of inspiration for the ST use of tin-bronze (Chernykh 1992: 185, 224, 229). A decorated axe-celt and a lance-head of the ST type have been excavated relatively recently at the Okunevo settlement

Mulg'a east of the Minusinsk Basin; this has given Hermann Parzinger (2002: 162; 2006: 306) reason to maintain that the ST artifacts indeed originated in the Okunevo culture.

The inventory of the Okunevo metal artifacts is so "primitive" that it would indeed be surprising if the Okunevo people could have suddenly created the highly advanced ST metallurgy. Excluding the single spear-head from a late Okunevo burial, the absence of weapons for warfare is also striking, while weapons figure prominently in the ST and Abashevo assemblages (see Chernykh 1992: 219-223 figs. 73-77 and 196 fig. 68 respectively). With the current datings, the Okunevo culture is contemporary with the ST network, and the use of tin-bronze could equally well or better have started with the ST network. There is no denying that the ST tin-bronze comes from mines in Sayan and Altai, nor that the sculptures of the ST daggers from Siberia depict local animals, but these facts do not prove that the ST network originated in Siberia. Carpelan & Parpola (2001: 98-111) have argued in detail that the creators of the ST network were experienced metallurgists of the Abashevo culture, who were technically much more advanced than the Okunevo smiths.

On Mid-Kama, at its confluence of Chusovaya, very close to the modern city of Perm, is Turbino, the most important ST site. It consists of two cemeteries containing more than 200 burials. "Every fifth burial at Turbino belonged to a representative of the Abashevo community. These burials are marked out from the others by the presence of exclusively Abashevo-type tools, cast from Tash-Kazgan arsenical copper. It is also noteworthy that it is extremely rare [but possible! AP] to find Abashevo and Seima-Turbino objects in the same burial. [...] It is also characteristic that the burials with Abashevo objects are scattered all over the Turbino territory and do not form obvious clusters." (Chernykh, 1992. p. 228-229). A settlement connected with the Turbino cemetery has not (yet) been located, but it seems possible to propose that a sizeable number of Abashevo people shortly before 2200 BCE moved from Balanbash on Lower Kama to the heart of the Garino-Bor culture on Mid-Kama, and that these immigrating Abashevans there formed an elite layer of a bilingual society. It was probably from the language of these Abashevo people that Proto-Uralic got its earliest Aryan loanwords. The loanwords attest for bilingualism and close collaboration between the speakers of these languages.

Dated to 4000-1600 BCE (Molodin & al. 2014), the Pri-Kama cultures had since the late fourth

millennium (with possible Yamnaya influence) developed metalworking based on pure copper smelted from local sandstone (Nordqvist & al. 2012: 15-16). Various tools (awls, fishhooks, knives, adzes) and rings, all of wide distribution, were produced by hammering; casting was done primitively in open moulds. Slags and metallurgical waste have been found in the settlements Igimskaya and Russko-Azibejskaya. (Kuz'minykh, 1977. p. 33-34; Chernykh, 1992, p. 173 fig. 63; 186-187; Kuz'minykh & al. 2013).

It was search for new sources of metal that may have motivated Abashevo people to migrate to Mid-Kama. Probably the Abashevo metallurgists taught Garino-Bor smiths better techniques. It may have been in this connection that they came to develop core casting, which enabled casting socketed axes and spear-heads in one piece. (They may also have obtained this innovative technique from the Caucasus through itinerant craftsmen; see the detailed discussion in Carpelan & Parpola 2001:102-106). One circumstance supporting local Kama origin is the form of the ST socketed axe, which apparently imitates the contemporary stone axe of the Urals region (Childe, 1954. p. 24; Carpelan & Parpola, 2001. p. 106). Axe is a most important tool in forest environment. It could also be used as an effective weapon of war. A good metal axe would be a much desired item of trade. The ST tradition of making socketed axes (and other ST-like items) survived in the Kama region for more than a millennium (Kuz'minykh 1991), until the powerful Anan'ino culture of the Kama and Vyatka valleys started mass-producing such celts anew in 800 BC (Koryakova & Epimakhov 2007: 194-196; 252-260; Kuz'minykh & Chizhevskij 2014; 2020) (**Fig. 6**).

But an axe made of pure copper, even if better than a stone axe, is not as effective as a bronze axe, especially an axe made of tin-bronze, which the ST produced in Siberia from metal coming from the mines of Sayan and Altai mountains. Many people certainly wanted to have such an axe. The ST tools and weapons could be marketed along the pre-existing trade routes of the forest zone, formed already during the Neolithic period. The creators of the ST network had to take into their control these trade routes and also the important copper and tin mines of the Sayano-Altai region, the existence of which might have been known to the Garino-Bor people. The Abashevo men's experience with such undertakings can be seen from the earlier discussed Pepkino kurgan, the burial of 28 Abashevo warriors killed in a battle — one of them a smith. David Anthony (2007:

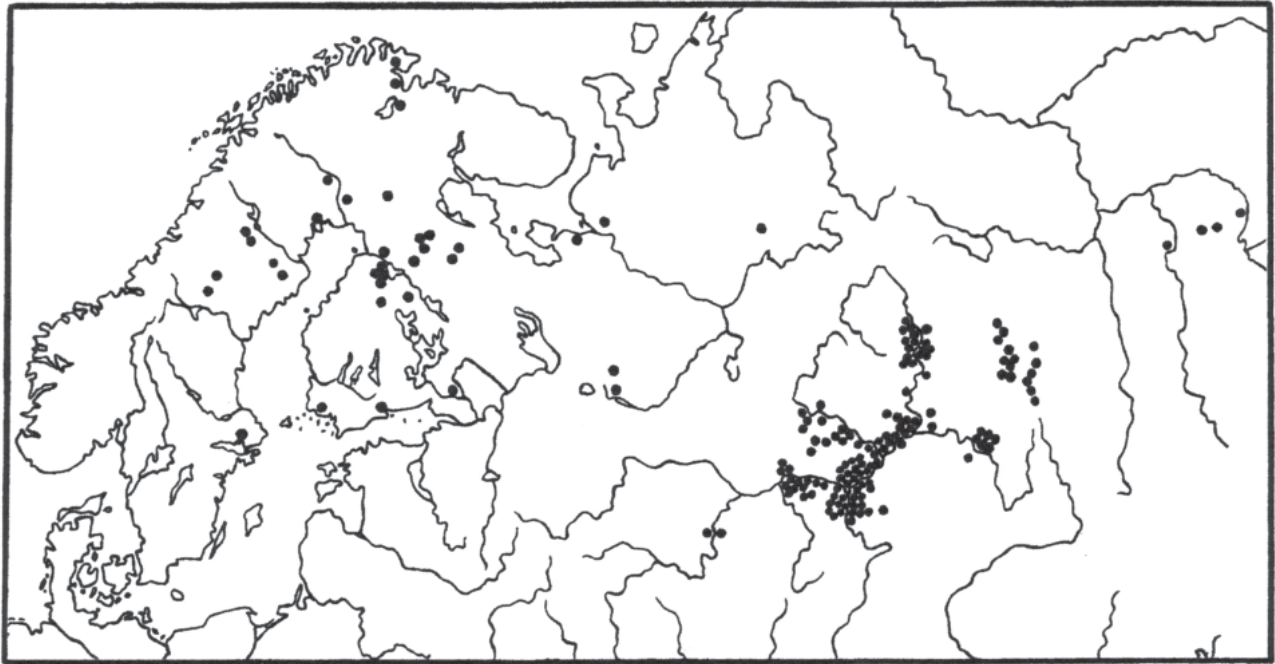


Fig. 6. Find places of Anan'ino axes. After: Ku'zminykh, 1996: 20 fig. 12.

Рис. 6. Места находки топоров ананьинской культуры. По: Кузьминых, 1996: 20, рис. 12.

385) has reckoned that the Abashevo force in this battle was about 280-560 men, "because deaths in tribal battles rarely reached 10% of the fighting force and usually were more like 5%". Besides providing leadership and fighting experience, the Abashevo people could arm the initial trading expedition with effective weapons and possibly horses. The ST necropole of Rostovka on the Irtysh River in Siberia contained a spearhead and a knife of the Abashevo-Sintashta type, made of arsenical copper from the Urals (Chernykh 1992, p. 224).

While it is reasonable to assume Abashevo participation in this proposed introductory trade expedition, the main part of the force must have consisted of young Proto-Uralic speakers, who knew the routes and were experienced in forest travel. This can be concluded from the end result: the ancestors of the Samoyed speakers now started moving from their original Kama homeland to their new homeland in the Sayano-Altai region, where dialects of two now extinct Sayan Samoyed languages were spoken until the early 19th century (Kamas & Koibal on the one hand, and Mator, Taigi, Karagas and Soyot on the other; Joki 1952; Salminen 1997). One southern Samoyed language, Selqup, is still spoken in the upper reaches of the Ob and Yenisei Rivers.

That a few hundred Uralic-speaking immigrants could have taken over the rule in the local cultures of Sayano-Altai, and moreover to have imposed their own language upon the people of these cultures instead of being linguistically

absorbed, presupposes that they came with the strong military power characteristic of the Sejma-Turbino network. But besides sheer armed force it also required continuous upkeep of the trade network for centuries and recruiting local leaders to become its members, by marriage alliances, and by offering the local chiefs various benefits in addition to allowing them to retain their former positions. The Uralic language became the *lingua franca* of the ST elite that retained its power in western Siberia and this language was gradually adopted by a growing number of local people. Ronald Atkinson (1989; 1994) has recounted in detail how the Acholi community, coming from southern Uganda, in 1675-1872 managed to impose their minority language Luo upon the whole Uganda and southern Sudan with precisely such a policy. It has been proposed that the Indo-European and Uralic languages expanded in a similar way (Mallory 2001: 360-364; Anthony 2007: 117-119, 259). "Immigrant elite languages are adopted only where an elite status system is not only dominant but is also open to recruitment and alliance" (Anthony, 2007.p. 118). The Sejma-Turbino network functioned long enough, three centuries (2200-1900 BC, Marchenko & al. 2017), for the language shift to take place and to establish the Samoyed language in the Sayano-Altai region. If the Uralic immigrants were only men, who married local women, it is understandable that Pre-Proto-Samoyed started losing part of its inherited vocabulary right from the first bilingual generation: Uralic words were

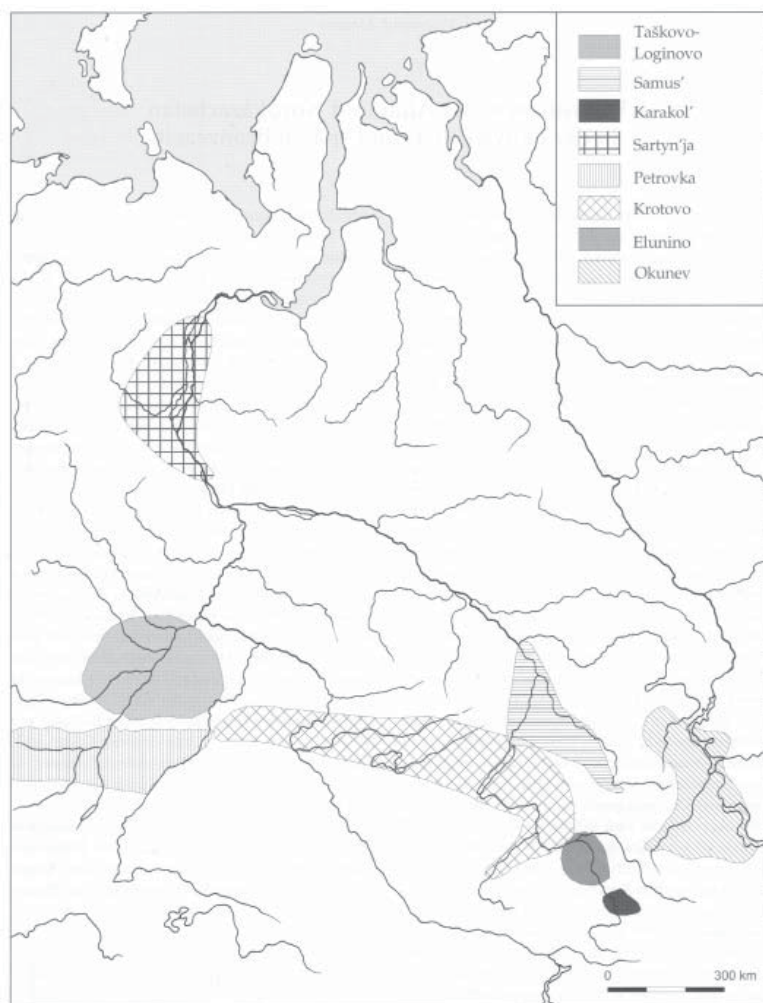


Fig. 7. Location of the Late Bronze Age cultures Samus', Krotovo, Elunino, Karakol' and Okunevo in the Sayano-Altai region of western Siberia. After: Molodin, 2001: 86 fig. 1.

Рис. 7. Местоположения культур эпохи поздней бронзы: Самусь, Кротово, Елунино, Караколь и Окунево в Алтайско-Саянском регионе Западной Сибири. По: Молодин, 2001: 86, рис. 1.

gradually replaced with borrowings from extinct Palaeo-Siberian substrates (Aikio 2002: 50-52; J. Häkkinen 2009: 11-12; Kallio 2015: 80).

Thus the ST network managed to subject and keep in control those local pastoralist-hunter-fisher communities, where the Sejma-Turbino weapons were actually produced (**Fig. 7**): the **Odino culture** from the Lower Ishim to the Baraba steppe (Parzinger 2006: 278-281), the **Samus' culture** on the Middle Irtysh, where the important ST necropole of Rostovka is situated (Parzinger 2006: 281-285), and the Samus' extension on the Upper Ob (Parzinger 2006: 291-296), the **Krotovo culture** on the Upper Irtysh (Parzinger 2006: 285-289), and the **Elunino culture** on the Upper Ob (Parzinger 2006: 296-297). The **Karakol' culture** on the Upper Ob (Parzinger 2006: 297-300) is connected with the above mentioned cultures, but more with the Okunevo culture of the Middle Yenisei in the Minusinsk Basin, Chakasia, and Tuva (Parzinger 2006: 300-312). These cultures had pre-existing contacts with the Yenisei and Lake Baikal regions, and the ST nephrite and bone objects came from this local Siberian trade.

These West Siberian hunter-fisher cultures must have had their own modest metallurgical traditions, which are likely to have influenced the ST production to some extent. While part of the ST weapons were probably produced by the Abashevo-trained Uralic-speaking smiths traveling with the ST trading patrols, part seem to have been manufactured by local smiths trained by these traveling ST smiths. The burial of one smith with all his casting equipment at the Samus'-Krotovo cemetery Sopka-2 in the Baraba forest steppe reveals what a single smith could do (Molodin 1983; Chernykh & Kuz'minykh 1987 p. 206 fig. 47). Recent excavations at three sites of the Krotovo culture paid special attention to the archaeological contexts of bronze casting of ST type weapons. At Abramovo-10, the casting area was located between the houses; at Vengerovo-2, there was a separate structure provided with furnaces and utility pits. Certain features suggest that the casters followed their own local metallurgical traditions. (Molodin & al. 2018.)

Part of the locally produced bronzes were probably collected as revenue by the patrolling ST armed traders for their arms business and

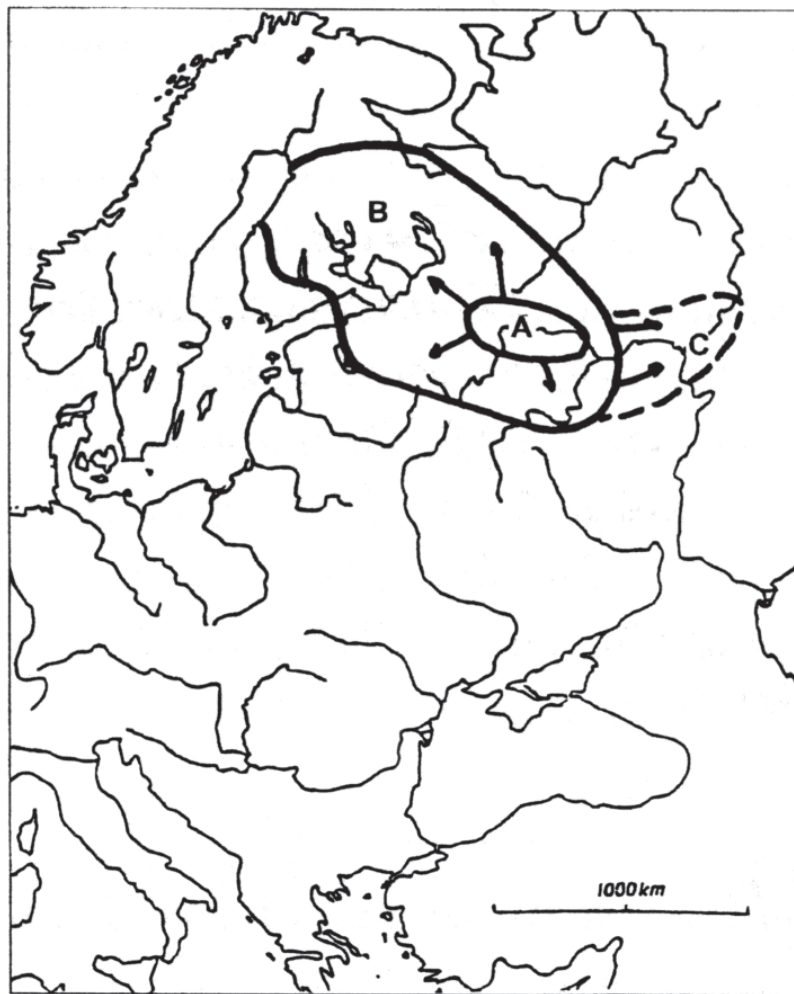


Fig. 8. Distribution of the Netted Ware.

A: Emergence of Netted Ware in the Upper Volga region c. 1900 calBC. B: Spread of Netted Ware c. 1800 calBC. C: Eastward spread of Netted Ware in Early Iron Age. After Carpelan in: Carpelan & Parpola, 2001: 89 fig. 16.

Рис. 8. Распределение сетчатой керамики.

А: Появление сетчатой керамики в Верхневолжском регионе около 1900 г. до н.э. В: Распространение сетчатой керамики около 1800 г. до н.э. С: Распространение сетчатой керамики на восток в раннем железном веке. По Карпелану: Карпелан и Парпола, 2001: 89, рис. 16.

part of them reached the supposed 'headquarters' of the ST network at Turbino. Chernykh and Kuz'minykh have established that the trading direction of the Siberian ST artefacts was only from east to west. At the same time they have wondered why the ST traders avoided the steppe zone and instead travelled to the northwest through the hard route of marshy taiga. (Chernykh, 1992, p. 223-227) This becomes understandable if the original homeland of the Uralic-speaking ST traders was in the Kama Valley with Turbino as the headquarters of the ST network.

Most Uralic languages have cognate words denoting 'metal', such as Finnish *vaski* 'copper, bronze', Udmurt *-veś* (in compounds), Khanty *way*, *waχ* 'metal, iron', or Hungarian *vas* 'iron', including six Samoyed languages (SSA 3, 2000: 416a). The Samoyedic protoform has been reconstructed as **wesä* (Janhunen 1981: 6 no. 25). Proto-Uralic reconstructions **wäskä* and **wäski* have been proposed and found support, while other scholars find it impossible to reconstruct the word for Proto-Uralic. Ante Aikio (2015: 42-43) concludes his detailed examination as follows:

"The pervasive irregularities in this lexical set indicate that we are not dealing with a Proto-

Uralic item but a Wanderwort that has separately entered the already differentiated branches of the family — as has already been suggested long ago. That words designating metals turn out to be borrowings is, of course, not unexpected in the least."

The main external etymology proposed connects these words with Proto-Tokharian **wesa* (Tokharian A *wäs*, B *yasa*, 'gold', Pinault 2008: 444-445), either deriving the Tokharian word from Uralic (Aalto 1959; Joki 1973: 339-340; Rédei 1986: 42-43; Kallio 2004: 131-133; 2006: 7) or deriving the Uralic words from Tokharian (Janhunen 1983: 120-121; Napol'skikh, 2001. p. 374-375; Kallio, 2004. p. 132-133; Kallio, 2006. p. 6-7). Juha Janhunen (1983) has suggested that Proto-Samoyed **wesä* should be considered as a separate borrowing from Pre-Tokharian. Ante Aikio (2015: 43), reviewing the Samoyedic evidence, reconstructs the protoform as **wäsa*, which has "anomalously disharmonic shape". The proposed Pre-Tokharian origin suggests that the word existed in the Siberian substrate languages of Samoyed. On the other hand, the wide distribution of the word in Uralic languages coupled with the difficulty of deriving it from

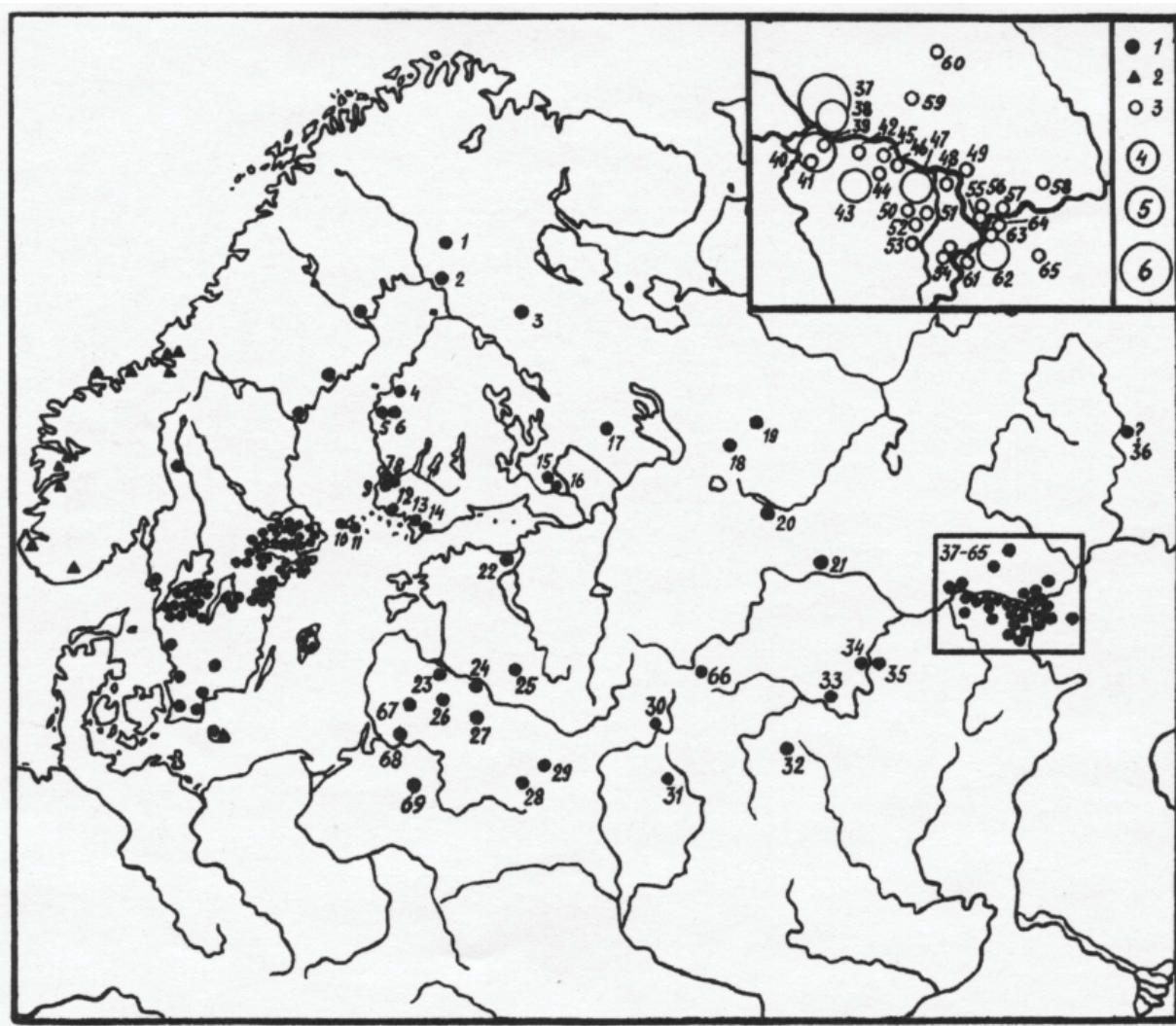


Fig. 9. Find places of Akozino-Mälars axes (c. 800-500 BCE).

After: Kuz'minykh, 1996: 6 fig. 2.

Рис. 9. Места находки топоров Акозинско-Меларского типа (около 800–500 гг. до н.э.).

По: Кузьминых, 1996: 6, рис. 2.

Proto-Uralic suggest that it spread with the ST network.

The horse figures prominently in the decoration of the ST knives of western Siberia; the knife from Rostovka depicts a ski-jorer pulled by a horse. Chernykh and Kuz'minykh have stressed the ST use of horses to cover great distances. However, the ST people did not ride horses (there are no rider figures, and riding came to these parts much later), but probably used horses as pack-animals and for pulling sledges in the winter. Horses can only pull light-weight carts, and the question arises: did the ST people play some role in the development of the spoke-wheeled chariot? The horse-drawn chariot appears completely ready without any preliminary phase in the Sintashta culture c. 2000 BC. The ski-jorer figure attests to the existence of reins, so the ST people are likely to have developed the horse harness. This is suggested also by the linguistic evidence, for

one of the early Aryan loanwords denotes in OIA 'reins': PU **rečmä* 'rope' < Pre-PIIr *Hrečmi-* > PIIr *Hračmi-* > OIA *rašmi-* 'reins' (Holopainen 2019: 207). Even the word for 'horse' might be a Pre-IIr loan in Proto-Uralic, although it is attested in Finnic only: Finnic **hëpo* (with post-PU stem gradation: genitive **hëvon*) < PU **čeva* (with metathesis) < PreIIr (H)*ečvo-* > OIA *ašva-* 'horse'. (For earlier proposed etymologies, see <https://sanat.csc.fi/wiki/Etymologiadata:imsm:hëpo>; the most important competitor is Lithuanian *ašvà/ešvà* 'mare').

A network of armed traders mediated ST artifacts made of the pure copper of the Urals westwards, up to the Oka River, where two important ST graveyards Sejma and Reshnoe are situated. The daggers of the western branch of the ST network differ from those of the eastern branch. They have a symmetrically two-edged straight blade and are decorated with images

characteristic of the animal art of the east European forest zone, while the daggers of the eastern branch are curved, have one blade and are decorated with images of Siberian animals (Carpelan & Parpola 2001: 106-9 with figs. 25-27). Petri Kallio (2006: 16-17) suggested that Finnic and Saami would have come to the East Baltic region with the ST network already 1900 BC. However, it rather seems that the warrior-traders of the western branch of the ST network managed to make Proto-West-Uralic (the protolanguage of the Mordvin, Finnic and Saami branches) the language of the emerging **Netted Ware alias Textile Ceramic culture** (c. 1900-500 calBC) of the Upper Volga — Oka area (Parpola 2012: 156). The Netted Ware culture submerged the earlier Fatyanovo-Balanovo, Abashevo and Volosovo cultures of the region (**Fig. 8**) (Carpelan & Parpola 2001: 87-89).

The power of the ST network of warrior-traders to impose its language upon foreign cultures is paralleled in the further westward expansion of West Uralic nearly thousand years later. While the Mordvin language gradually developed in the old homeland of the Netted Ware, part of Netted Ware people moved around 1000 BC eastwards to Mid-Volga area between the mouths of the Oka and Vyatka rivers, to the future homeland of the present-day speakers of the Mari (Cheremiss) language, which is linguistically between the Permic and West Uralic languages. (Fig. 8: C.) Under the multiple influence of the nearby Anan'ino culture (with Pre-Proto-Permic as its language), the Lusatian/Lausitz culture of Poland, and the early Scythian- and Sarmatian-related cultures of Iranian speakers in the south, this eastern expansion of the Netted

Ware developed into the Akozino-Akhmylovo culture (800-300 BCE) (Patrushev 2000; Parpola 2012: 151-153). During 800-500 BCE, warrior-traders of the Akozino-Akhmylovo culture distributed so-called "Akozino-Mälär axes" from Mid-Volga to the Baltics, to southwestern Finland, and to the Lake Mälaren area in central Sweden (Kuz'minykh 1996) (**Fig. 9**). This was the culmination of an immigration wave from western Russia to the Baltics and Fennoscandia, which had started around 1000 BCE, and which established in these parts the Late West Uralic language. This language started differentiating after its arrival to the said regions under the substratum influence of earlier local languages, Baltic, Germanic and (especially in Fennoscandia) lost idioms. Saami formed in Finland and Karelia, spreading gradually northwards to Lapland and therefrom southwards to Norway and Sweden. Finnic formed in Courland and Estonia, then since the beginning of the Christian era spreading northwards to Finland and Karelia, where it gradually submerged Saami. Around Lake Mälaren in central Sweden, the Late West Uralic speaking immigrants could not effect a language shift, but moved northwards and eventually joined the southwards moving Saami population, contributing some unique archaisms to South Saami. Everywhere the immigrants also brought a new eastern type of burial (so-called *tarand* graves, from "houses of the dead") and hill forts similar to the *gorodishche* of Early Iron Age western Russia, and initiated a new type of pottery (Ilmandu ceramics in Estonia, Morby ceramics in Finland, striated pottery in central Sweden). (Parpola 2012: 151-155; 2017: 254-260; Lang 2015; 2018; 2020.)

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