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Asko Parpola (Helsinki)

Finnish *vatsa* ~ Sanskrit *vatsá-* and the formation of Indo-Iranian and Uralic languages

Finnish *vatsa* 'stomach' < PFU **vaćća* < Proto-Indo-Aryan **vatsá-* 'calf' < PIE **vet-(e)s-ó-* 'yearling' contrasts with Finnish *vasa-* 'calf' < Proto-Iranian **vasa-* 'calf'. Indo-Aryan *-ts-* versus Iranian *-s-* reflects the divergent development of PIE *-*tst-* in the Iranian branch (> **-st-*, with Greek and Balto-Slavic) and in the Indo-Aryan branch (> **-tt-*, probably due to Uralic substratum). The split of Indo-Iranian can be traced in the archaeological record to the differentiation of the Yamnaya culture in the North Pontic and Volga steppes respectively during the third millennium BCE, due to the use of separate sources of metal: the Iranian branch was dependent on the North Caucasus, while the Indo-Aryan branch was oriented towards the Urals. It is argued that the Abashevo culture of the Mid-Volga-Kama-Belaya basins and the Sejma-Turbino trade network (2200–1900 BCE) were bilingual in Proto-Indo-Aryan and PFU, and introduced the PFU as the basis of West Uralic (Volga-Finnic) into the Netted Ware Culture of the Upper Volga-Oka (1900–200 BCE).

1. Introductory remarks

The new etymology of Finnish *vatsa* presented in this paper and its significance dawned upon me on the 24th of September 2014, but due to other work this article remained unwritten and nearly forgotten for three years. The impulse to compose it came from the international colloquium "Contextualizing historical lexicology" held at the University of Helsinki on 15–17 May 2017. I attended the lectures held on the last day, in particular Martin Kümmel's keynote speech "Etymological problems between Indo-Iranian and Uralic". Kümmel was rather critical with regard to many of the Indo-Iranian etymologies proposed for Uralic words by my late friend Jorma Koivulehto (1934–2014), and, in private conversation, sceptical also about the possibilities to identify specifically Indo-Aryan loanwords in Uralic languages. My former student and friend Petri Kallio, one of the editors, presented me a 736-page book called *Verba vagantur* (2016 [2017]) just out of press, a selection of Koivulehto's papers reprinted along with his bibliography and a comprehensive word-index to Koivulehto's entire production. Also present was another editor of book, Sampsa Holopainen, who is preparing a doctoral dissertation on the Aryan loanwords in Uralic languages. There is thus reason to make my current views on this topic accessible to Holopainen and other scholars. The etymology of Finnish *vatsa* has repercussions on the linguistic history of the Indo-Iranian borderlands as well, and in discussing these problems I can now draw also on the constructive criticism of my 2015 book *The Roots of Hinduism* received in February-March 2017 from my friend Chlodwig Werba in Vienna. My "new archaeological model for the prehistory of the Uralic

languages" (Parpola 2012a: 150–169) also requires some adjustment, especially taking into consideration its improvements with regard to Finno-Saamic by Valter Lang (2015–2017). I am most grateful to Petri Kallio, Riho Grünthal, Juha Janhunen and two anonymous referees for their critical comments on the draft version; these comments have been integrated in the article with proper acknowledgement.

2. Correlating archaeological and linguistic genealogies: on the formation of Indo-Iranian and Finno-Ugrian

One of the theses of this paper is that Finnish *vatsa* and its cognates go back to a Proto-Finno-Ugric borrowing from the Indo-Aryan sub-branch of the Aryan alias Indo-Iranian branch of the Indo-European language family. This Indo-Aryan affinity is important for determining the time and place of the borrowing: the determination is possible with reference to archaeology. At the same time, the Indo-Aryan affinity is also important for validating the reconstructed archaeological model for the formation of the Indo-Iranian and Uralic languages. It will be easier to follow my presentation if I first sketch the outlines of this model, rather than just refer to earlier publications (Parpola 2012a and 2015, with more detail and literature). Besides, this enables me to make some adjustments to the model. The dates for the archaeological cultures are mainly based on Chernykh (2009), but in some cases on more recent results (Rassamakin 2012 for the Tripolye culture, and Marchenko & al. 2017 for the Sejma-Turbino network).

Building upon the "Kurgan culture" hypothesis of Mariya Gimbutas, J. P. Mallory in his *In search of the Indo-Europeans* (1989) has, in my opinion quite convincingly, established that the roots of Early Proto-Indo-European (PIE) are in the Neolithic Khvalynsk culture (5000–4500 BCE) of the Mid-Volga. (This location in Mid-Volga is close enough to the Kama Valley around which the Uralic homeland probably was situated to account for the earliest linguistic relations between the Indo-European and Uralic language families.) In the Copper Age, the Khvalynsk people expanded westwards, to the area of the Dnieper-Donets culture, thereby creating the pastoralist Srednij Stog II culture (4700–3500 BCE) of the Pontic steppes. (On the Khvalynsk and Srednij Stog II cultures, see Mallory 1989: 186–210; Anthony 2007: 135–162, 174–192, 239–249).

These Copper Age pastoralists of the Pontic steppes received their metal objects and other prestige goods from the neighbouring (Cucuteni-)Tripolye culture (5600–3000 BCE) agriculturalists in northeastern Romania and southern Ukraine (on the Cucuteni-Tripolye, see Anthony 2007: 162–174). The Tripolye culture was the easternmost extension of the flourishing community of the Balkano-Carpathian farmers, who had founded what E. N. Chernykh (1992) calls the world's first "Metallurgical province" of miners and metallurgists (Fig. 1). They undoubtedly spoke some lost non-Indo-European language(s).

In the last quarter of the fifth millennium BCE, the Srednij Stog II people of the Pontic steppes invaded the Balkans, caused great destruction to the local cultures, and founded there the Cernavoda culture (4000–3200 BCE). Through this and the following Ezero culture (3300–2700 BCE) (Fig. 3), the Early PIE language seems to have entered from the Balkans to Anatolia, where the pottery of the Troy I culture (2900–2500 BCE) (Fig. 3) has its origin in the Ezero culture. This archaeological chain enables to derive the Hittite and Luwian languages from Early PIE (Mallory 1989: 233–243; Anthony 2007: 225–262; Parpola 2008: 33–36).

At the same time as they invaded the Balkans, the Srednij Stog II people also invaded the Tripolye culture, but did not destroy it. (Mallory 1989: 235–237; Anthony 2007: 230–239). On the contrary, the Srednij Stog chiefs apparently took over the rule in the Tripolye culture, which became the most populous agricultural community of the Copper Age world. Wheeled vehicles (ox-drawn heavy wagons and carts) were invented around 3600 BCE in the Late Tripolye culture, which needed transport for its agriculture and logistics for its mega-settlements, villages of up to 400 hectares and up to 15,000 inhabitants. The inventors must have spoken Late (or Core) PIE, because the PIE language had about a dozen native terms related to wheeled vehicles (if new inventions are borrowed, the relevant terms are usually borrowed too). A steady increase of steppe-type pottery in the Late Tripolye culture (phase C1, 4050–3000 BCE) – from 10% of the total ceramics to dominant type – suggests constant infiltration of the Tripolye culture by pastoralists from the Pontic steppe, and language shift from non-IE to Late PIE. (Parpola 2008.)

The formation of the Corded Ware cultures (2900–2300 BCE) that extend from the Netherlands in the west to Mid-Volga in the east has been much debated (see Mallory 1989: 243–257). Recent studies of ancient DNA suggest steppe ancestry (Kristiansen & al. 2017), but whether this gene flow came from the steppe immigrants of the Late Tripolye or from the Yamnaya cultures remains to be verified. In any case, there is wide agreement that the formation of the Germanic and Balto-Slavic branches of the IE language family started with the integration of the Corded Ware cultures with the earlier local populations in northwestern and northeastern Europe.

Already before its disintegration, the Late Tripolye culture had exerted strong influence upon the Pontic steppes, the homeland of Early PIE, where the Yamnaya (alias Pit Grave) cultures (3300–2300 BCE) succeeded the Srednej Stog II culture. A very early offshoot of the Yamnaya complex proceeded quickly with wagons far to the east, forming the Afanas′evo culture (3300–2400 BCE) in southern Siberia and western Mongolia. The Afanas′evo culture may be the source of the Tokharian language, spoken in the first millennium CE in Sinkiang: Tokharian has escaped the satem innovation that affected other eastern IE languages ancestral to Albanian, Armenian, Balto-Slavic and Indo-Iranian. (Fig. 2)

Proto-Indo-Iranian seems to have formed in the Yamnaya cultures of the North Pontic and Volga steppes, between the Bug and Ural rivers. The chains of successive cultures leading to the later speaking areas of the Iranian and Indo-Aryan languages can be traced to origins in this area. In particular, the Iranian branch seems to have

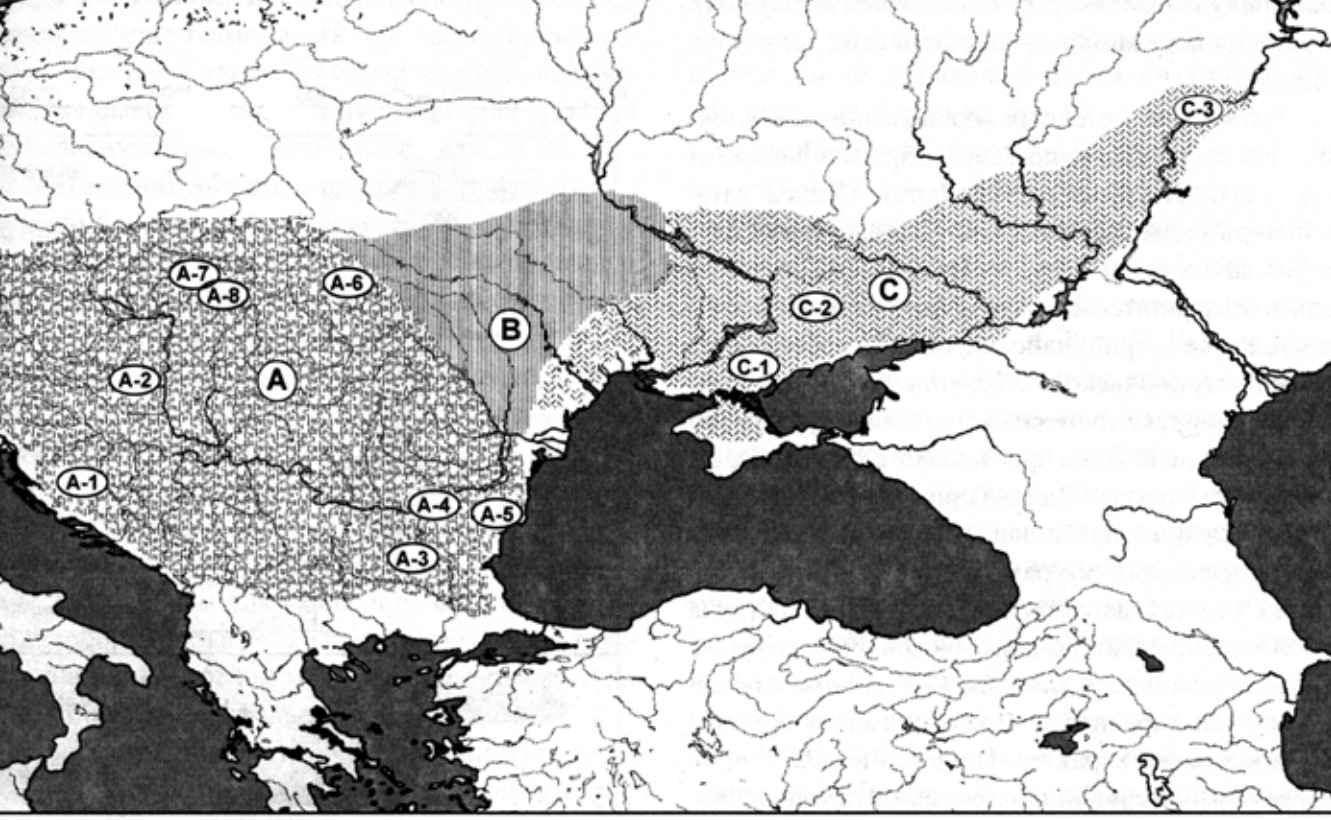


Figure 1: The "Balkano-Carpathian Metallurgical Province" of the fifth millennium BCE. A: Balkano-Carpathian cultures of settled farmers (A-1 Butmir, A-2 Vinca C/D, A-3 Karanovo V - Maritsa, A-4 Karanovo VI - Gumelnitsa, A-5 Varna, A-6 Lengyel, A-7 Tiszapolgar, A-8 Bodrogkresztur).
B: The Cucuteni-Tripolye culture.
C: The steppe area (C-1 Mariupol', C-2 Srednij Stog, C-3 Khvalynsk). (After Chernykh 2008: Fig. 2.)

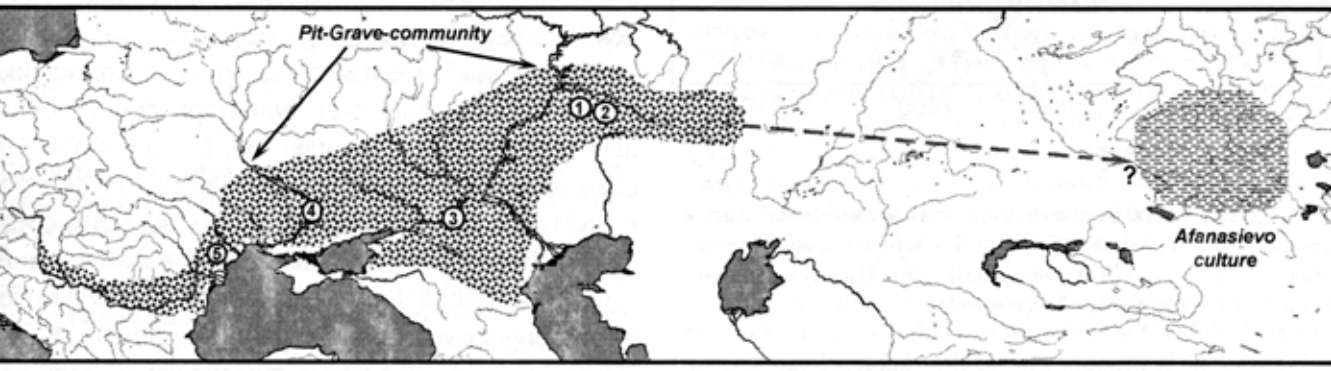


Figure 2. The Yamnaya and Afanas'evo cultures. Areal variants of the Yamnaya culture: 1 = Volga-Ural, 2 = Poltavka culture, 3 = Kalmykia and the Don-Donets basin, 4 = the Dnieper and South Bug basins, 5 = the northwestern coast of the Black Sea. After Chernykh 2008: Fig. 7.

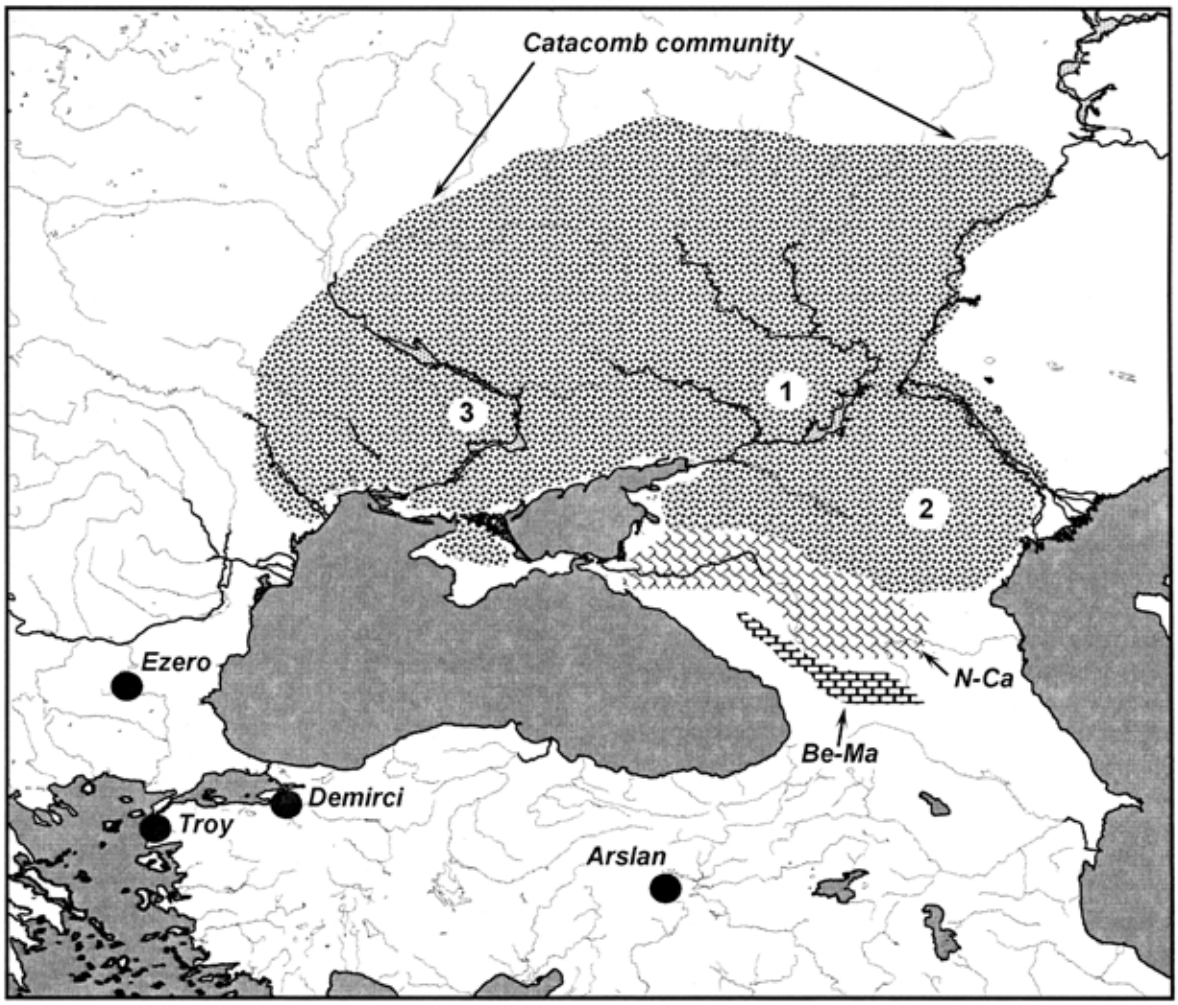


Figure 3. The Catacomb Grave culture (1: the Don-Donets basin, 2: Kalmykia, 3: the Dnieper and South Bug basins) and other cultures during the second phase of the "Circumpontic Metallurgical Province": N-Ca = the North Caucasian culture, Be-Ma = the Bedeni-Markopi culture. (After Chernykh 2008: Fig. 8.)

its origin in the Catacomb Grave culture (3000–2000 BCE) that developed from the Yamnaya cultures of the North Pontic steppe (Fig. 3), which was occupied by Scythian nomads speaking an Iranian language at the dawn of history in the first millennium BCE. The Indo-Aryan branch, on the other hand, seems to have developed from the more easterly Yamnaya cultures of the Volga-Ural steppes; their successors were the first to spread to the Asiatic steppes and eventually also to India.

At the same time as the Srednij Stog II people invaded the Balkans and the Tripolye culture, they also invaded northern Caucasus, founding there the splendid Majkop culture (4000–3000 BCE). This invasion was motivated by the copper resources of the Caucasus, which also attracted people from the Uruk culture of Mesopotamia. These events marked the creation of the "Circumpontic Metallurgical Province", which now replaced the "Balkano-Carpathian Metallurgical Province"

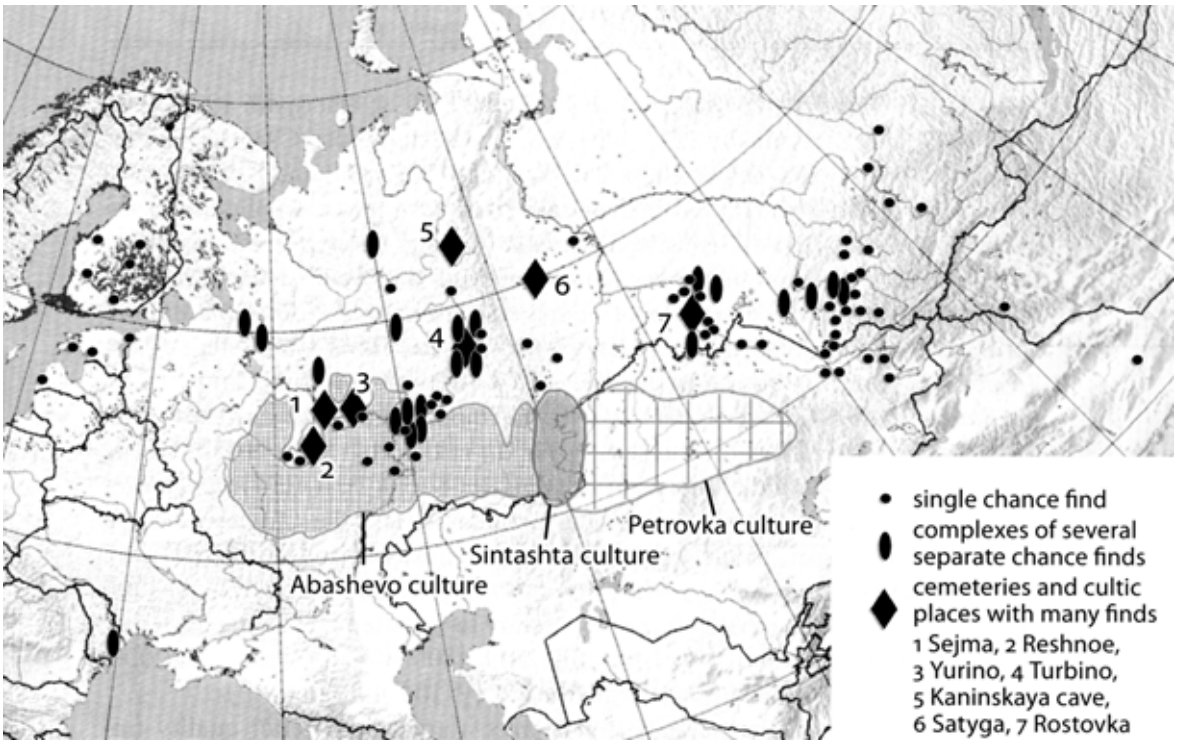


Figure 4. The formative phase of the "Eurasian Metallurgical Province", with the distribution of the Abashevo, Sintashta and Petrovka cultures (the map does not show Petrovka's wider extension to southern Central Asia, Turkmenistan, Tajikistan, Uzbekistan), and the finds of the Sejma-Turbino trade network. (After Parpola 2015: 57 Fig. 7.3, based on Chernykh 2007: 77.)

destroyed by the Srednij Stog II invasion. The Majkop culture was succeeded by the North Caucasian culture (3000–2000 BCE) (Fig. 3), which was the source of metal for the contemporary Catacomb Grave culture (3000–2000 BCE) that was formed in the Pontic steppe within the Yamnaya complex as a result of the North Caucasian cultural influence. (Chernykh 2009: 121–128.)

The eastern border of the Catacomb Grave culture and the Circumpontic Metallurgical Province was the Volga river. The eastern Yamnaya communities of the Volga-Ural steppes (3300–2300 BCE) exploited different metal sources in the south Ural steppe. The "Eurasian Metallurgical Province" of the Late Bronze Age really came into being around 2300 BCE, when the Abashevo culture (2300–1800 BCE) expanded from the Upper Don to the valleys of the Mid-Volga, Kama and Belaya rivers (Fig. 4). The target of this expansion was to take possession of the local sandstone deposits which were a rich source of pure copper. Subsequently, the Abashevo-related Sintashta culture (2200–1800 BCE) formed in the southern trans-Urals (Fig. 4). Its extension, the pastoralist Petrovka culture (2000–1700 BCE), spread widely in the steppes of western Siberia and southern Central Asia (Fig. 4). (Chernykh 2009: 128–133).

The Alakul′ Andronovo culture (1800–1500 BCE), which had a vast distribution in the steppe and forest-steppe of the Trans-Urals and Kazakhstan, is considered to

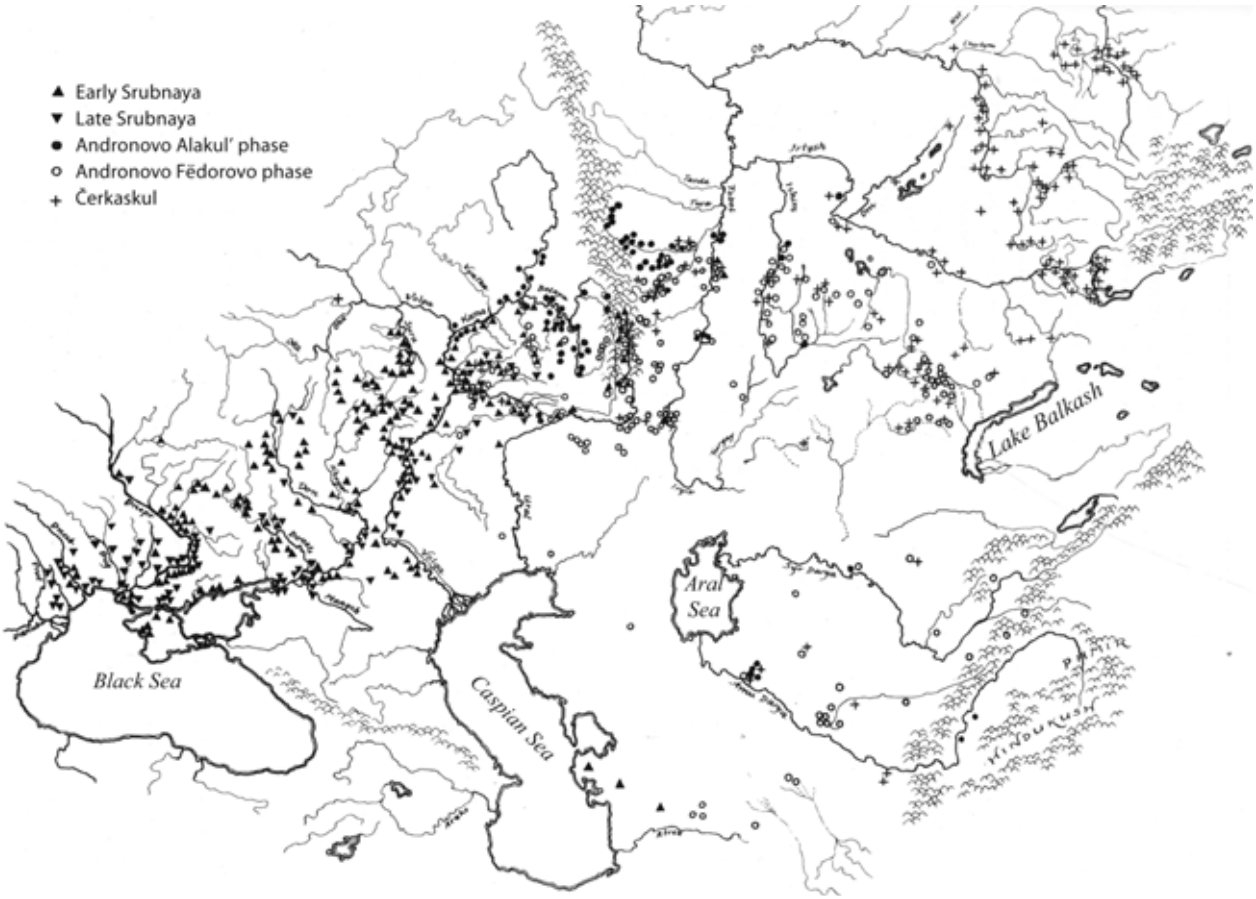


Figure 5. Distribution of the Srubnaya, Alakul' Andronovo, Fëdorovo Andronovo and Cherkaskul' monuments. (After Parpola 2015: 62 Fig. 7.6, based on Chlenova 1984: map facing page 100.)

have its origin in the Petrovka culture (Koryakova & Epimakhov 2007: 128–138). The more easterly distributed Fëdorovo Andronovo culture (1900–1400 BCE) is a very similar pastoralist culture with a different burial practice and debated origin (Koryakova & Epimakhov 2007: 138–150). (Fig. 5.)

The horse-drawn chariot was developed around 2100 BCE in the Sintashta culture, and spread quickly in many directions. Through the Petrovka culture it came to the Bactria and Margiana Archaeological Complex (BMAC) (2500–1500 BCE) of southern Central Asia, where Petrovka pastoralists speaking Proto-Indo-Aryan took over in the 20th century BCE, and continued in the BMAC garb to the Indus Valley on the one hand (e.g. BMAC cemeteries at Quetta and Sibri 1900 BCE) and to northern Iran (Tepe Hissar 1900 BCE) and Syria on the other. (Fig. 6.) The Mitanni kingdom of Syria (1600–1300 BCE) was ruled by kings with Indo-Aryan names, and a Mitannian called Kikkuli composed a manual for training chariot horses in the Hittite language, but with technical terms in Indo-Aryan. The Rigvedic hymns were composed in Old Indo-Aryan around 1300–1100 BCE in the Indo-Iranian borderlands and the northern Indus Valley. The horse-drawn chariot is mentioned hundreds of times in them, while there are just two clear references to horse-riding.

The Abashevo culture (2300–1800 BCE) expanded not only southwards within the forest steppe and grass steppe regions of the Trans-Urals, but also east and west in the northern forest zone. It was the copper-rich sandstone deposits of the Kama and Belaya Valleys that attracted the Abashevo people to move into their northern extension, an area which would be a good candidate for the homeland of Proto-Uralic speakers. On the basis of lexical evidence, Proto-Uralic speakers were sub-Neolithic hunter-gatherers, who practiced some metallurgy (the Uralic word **wäśka*[1] originally meant 'copper') and lived in the forest region of northern Russia near the Ural mountains (the Cembra pine, **sïksi* in Proto-Uralic, and the Siberian fir, PU **ńulka*, do not grow west of the Kama and Pechora rivers). The Chalcolithic Garino-Bor culture of the Kama and Vyatka Valleys practised limited metallurgy (Chernykh 1992: 186–187), and could well have been the original culture of Proto-Uralic speakers. In any case, the fact that Proto-Finno-Ugric had Aryan loanwords suggests that Proto-Uralic speakers formed the substratum of the Abashevo people in their new northern habitat in the forest zone, and that the two people mingled together into one bilingual society.

This hypothesis – that the northern extension of the Abashevo culture was bilingual in Proto-Uralic/PFU and Proto-Indo-Aryan – is made nearly certain by the possibility of explaining the dispersal of Proto-Uralic into its later branches by means of the Sejma-Turbino trade network (Fig. 4) closely connected with the Abashevo culture. This network produced and distributed high class bronze weapons from the Altai and Sayan mountains in Siberia to northern Europe up to Finland, a stretch of some 6000 km. With 19 radiocarbon dates, the duration of the Sejma-Turbino network was fixed to 2150–1600 BCE (with sigma 1 calibration) (Chernykh & al. 2017), but now, with 38 dates, to c. 2200–1900 BCE (Marchenko & al. 2017). This makes the Sejma-Turbino network contemporaneous with the Abashevo culture, and indeed Sejma-Turbino weapons are found on many Abashevo sites, e.g. at the Turbino burial ground on the Kama and at the Abashevo sites of the Mid-Volga basin. The well-armed trader-warriors of the network had strong military power, and were keen to make pacts with local rulers. Thus, they could also spread a language by imposing it on the local population through elite dominance.[2]

1. As Petri Kallio points out, the reconstruction of Proto-Uralic **wäśka* is problematic: "The cognate set displays multiple irregularities in vocalism due to which the attested forms cannot be reconciled into a single proto-form" (Aikio 2015: 42).

2. Chernykh (2009: 134) stresses "the extremely swift movements of the military of the Seima-Turbino groups": "The Seima-Turbino tribes consisted not only of metallurgists but also of warrior-horsemen. Their weapons and military organization appear to have been so good that they were able, in a very short span of time, to migrate over thousands of kilometres across the western Siberian forest-steppe and marshy taiga, over the Urals, and into the forested expanses of eastern Europe." (Chernykh 1992: 215). The horse figures prominently on the tops of the Sejma-Turbino metal knives (Parpola 2015: 64 Fig. 7.8) and stone sceptres (Parpola 2015: 65 Fig. 7.9), but no horse-rider is depicted; instead a ski-jorer pulled by a horse is figured in the top of one Sejma-Turbino knife (Parpola 2015: 67 Fig. 7.10). I suggest that the Sejma-Turbino warrior-traders did not ride, but used horses to pull their sledges in winter, a time suitable for expeditions of trading and raiding. The Andronovo pastoralists of the Asiatic steppes did not ride, but had horse-drawn chariots.

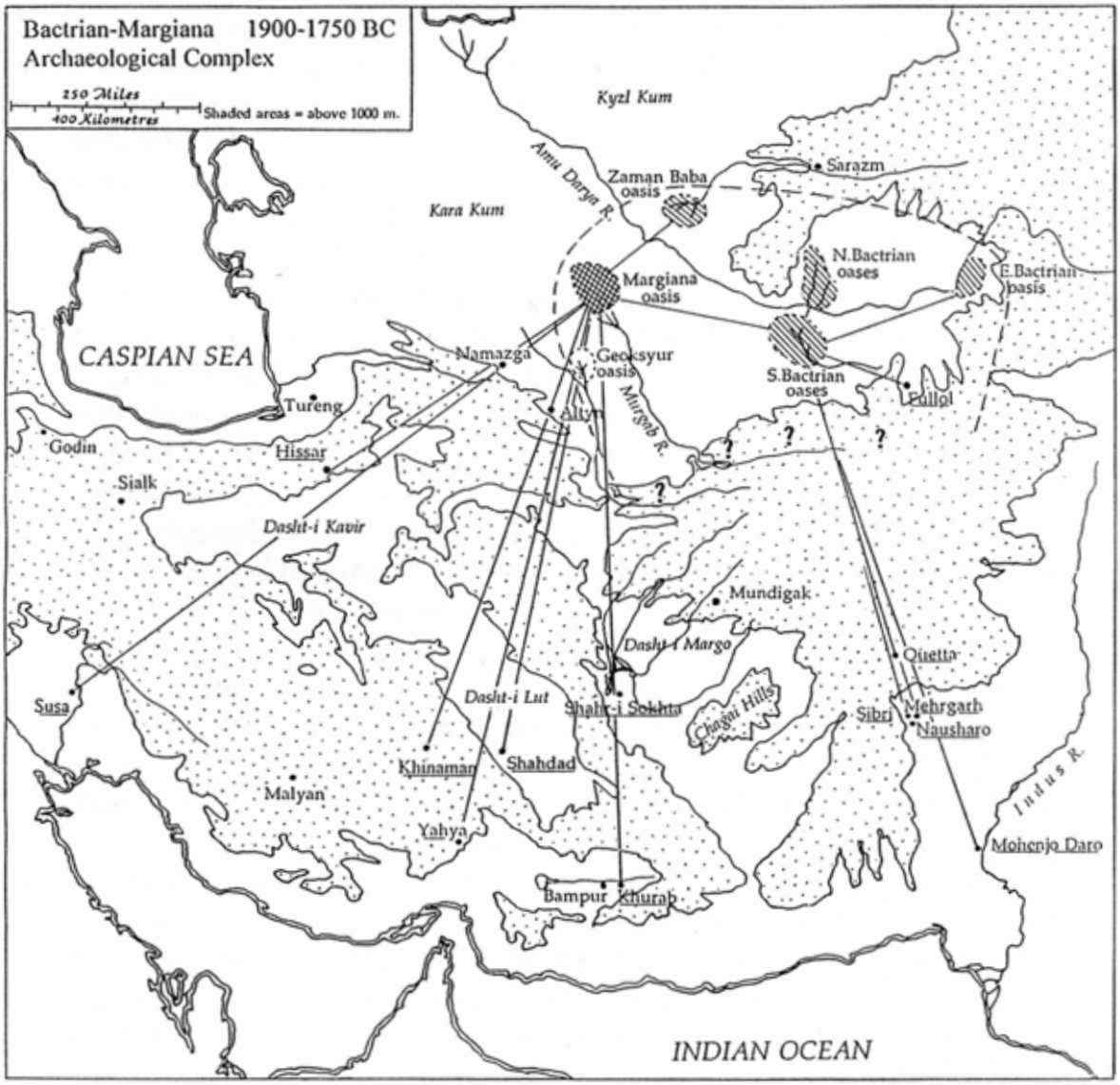


Figure 6. Expansion of the BMAC, c. 1900–1750 BCE. (After Hiebert 1994: Fig. 10.8.)

Chernykh (1992: 215–233; 2009: 133–134) and Chernykh and Kuz′minykh (1989: 266–277) have been arguing for an eastern (Altai and Sayan) origin of the Sejma-Turbino network, laying emphasis on the difference in technology and artefact forms from those of the Abashevo and Sintashta cultures. It can be argued, however, that the Sejma-Turbino metallurgy had its origin in the Abashevo culture, whose "metal mafia", on arriving to the forest zone, got from local people knowledge of the good ores of copper and tin in the distant Altai and Sayan mountains. Keen to take possession of this superior new source of metal and to start production there, they employed local hunters well aware of the long-distance routes to guide their metalsmiths to the Altai-Sayan mountains. Once there, these specialists had the requisite knowledge and means to develop their craft further, not excluding the influence of local metallurgical traditions, and then to export the newly designed products along the same route back to the west. A key issue concerning

the creation of the Sejma-Turbino network is the technique of core-casting by means of which it is possible to produce socketed spearheads and axes of one piece, a technique which could not be acquired from the local cultures around the Altai region, but which the Abashevo metalsmiths did possess. (Carpelan & Parpola 2001: 99–111.)

The creation of the Sejma-Turbino network in 2200 BCE offers a good archaeological counterpart for the break-off of the Samoyed branch from Early Proto-Uralic: if the Proto-Uralic speakers of the Abashevo culture stayed in the Altai-Sayan mountains – where Sayan Samoyedic was formerly spoken – they were virtually separated from the Finno-Ugric branch. This correlation has already been suggested by Christian Carpelan (1999: 270; 2000: 25–27; Carpelan & Parpola 2001: 109) and by Petri Kallio (2006: 16–17).[3]

While the majority of the Proto-Indo-Aryan speakers of the Abashevo culture seem to have moved to the Sintashta and Petrovka cultures, the Uralic speakers apparently prevailed in the Mid-Volga-Kama-Belaya area, where the Abashevo culture was succeeded by the Prikazan culture (1900–800 BCE) which received immigrants from both the Alakul′ Andronovo (linguistically belonging to the Indo-Aryan branch) and from the early Pokrovo variant of the Srubnaya culture (Fig. 5), descended via the KMK alias Babino III culture (2100–1850 BCE) from the Catacomb Grave culture (linguistically belonging to the Iranian branch). In the ninth century BCE, the Prikazan culture developed into the powerful Anan′ino culture (800–200 BCE) (Fig. 7), which undoubtedly had Proto-Permic as its language. Just as the Anan′ino had preserved its Uralic language from the Abashevo culture, so it had preserved the Sejma-Turbino traditions in its metallurgy, which started flourishing after fresh contacts with Iranian-speaking cultures from the south. Anan′ino exerted much influence both eastwards to the Urals and westwards to northern Fennoscandia. (Chernykh 1992: 262; Patrushev 2000: 89–99; Koryakova & Epimakhov 2007: 194, 252–261; Parpola 2012a: 163; Kuz′minykh & Chizhevskij 2017).

The Finno-Ugric branch spread with the Sejma-Turbino network rapidly westwards. The strong Abashevo/Sejma-Turbino influence on the local Volosovo and Fat′yanovo cultures (probably speaking an unknown substratum language and an early form of Balto-Slavic respectively) created the Netted Ware (Textile Ceramic) culture (1900–200 BCE) of the Upper Volga (Fig. 8). The language of its new leading elite, initially identical with Proto-Finno-Ugric, eventually prevailed in the Netted Ware culture as West Uralic alias Volga-Finnic. A strong influence on the Netted Ware culture was

3. In 2007 and 2009, Jaakko Häkkinen suggested common linguistic innovations for the Samoyed and Ugric branches, and on this basis I proposed (Parpola 2012a; b) connecting the supposed East Uralic with the Cherkaskul′ culture (1850–1500 BCE) of Bashkiria and the Mid- and South Trans-Urals. Part of Cherkaskul′ people became nomadic pastoralists, who spread widely to the Siberian steppes, even as far east as the Minusinsk basin (Koryakova & Epimakhov 2007: 150–155) (Fig. 5). Häkkinen's reconstruction of East Uralic uniting Samoyed with Ugric is, however, not accepted by a leading expert of Uralistics, Juha Janhunen (personal communication, 2017), and, on the other hand, the distance of the Samoyedic branch from Finno-Ugric seems to require a fairly early separation. The Cherkaskul′ culture, therefore, should rather be related to the Ugric branch, where the Hungarians have long been nomadic pastoralists, perhaps earlier than the Sargat culture (500 BCE to 300 CE) with which I have correlated them (Parpola 2012a: 167).



Figure 7. Distribution of the Anan'ino axes according to Sergej V. Kuz'minykh. (After Kuz'minykh 1996: 20 Abb. 12.)

exerted by its southern neighbour, the Pozdnyakovo culture (1800–1400 BCE), a variant of the Srubnaya culture (with an Iranian branch language) (Fig. 9).

Around 1700 BCE, the Netted Ware spread towards north and northwest, to eastern and central Finland and to Karelia. I have earlier correlated this migration with the formation of the Saami branch (Parpola 2012a: 155). Pauli Rahkonen (2013) has more plausibly associated it with toponymic evidence from this area that he interprets as traces of an otherwise unknown early form of West Uralic.

Around 1000 BCE, the Netted Ware spreads slightly eastwards to the Mid-Volga area between the mouths of the Oka and Vyatka rivers. Under strong influence of the powerful Anan′ino culture further east, this eastern expansion of the Netted Ware developed into the Akozino-Akhmylovo culture (c. 800–300 BCE) (Patrushev 2000; Parpola 2012: 151). On this basis, I made the following proposal:

> I suggest that Proto-Finnic was introduced to the Baltic area by warrior-traders of the Akozino-Akhmylovo culture, who brought the Akozino-Mälar axes to southern and southwestern Finland, the Åland islands and, in so great numbers that it must have involved the movement of a fair amount of people, to the Mälaren area of eastern Sweden around 800–500 BCE (Figure 7 [here Fig. 10]). This main route along which the Akozino-Mälar axes went westwards probably followed the same waterways as the Vikings later, but another trade route was through the Daugava valley mentioned earlier while speaking of South Estonian as the Finnic language that was the first to separate from the protolanguage. […] On the basis of the associated archaeological evidence detailed below, I suggest that the 'immigration of Finnic' was not from Estonia to SW Finland as has

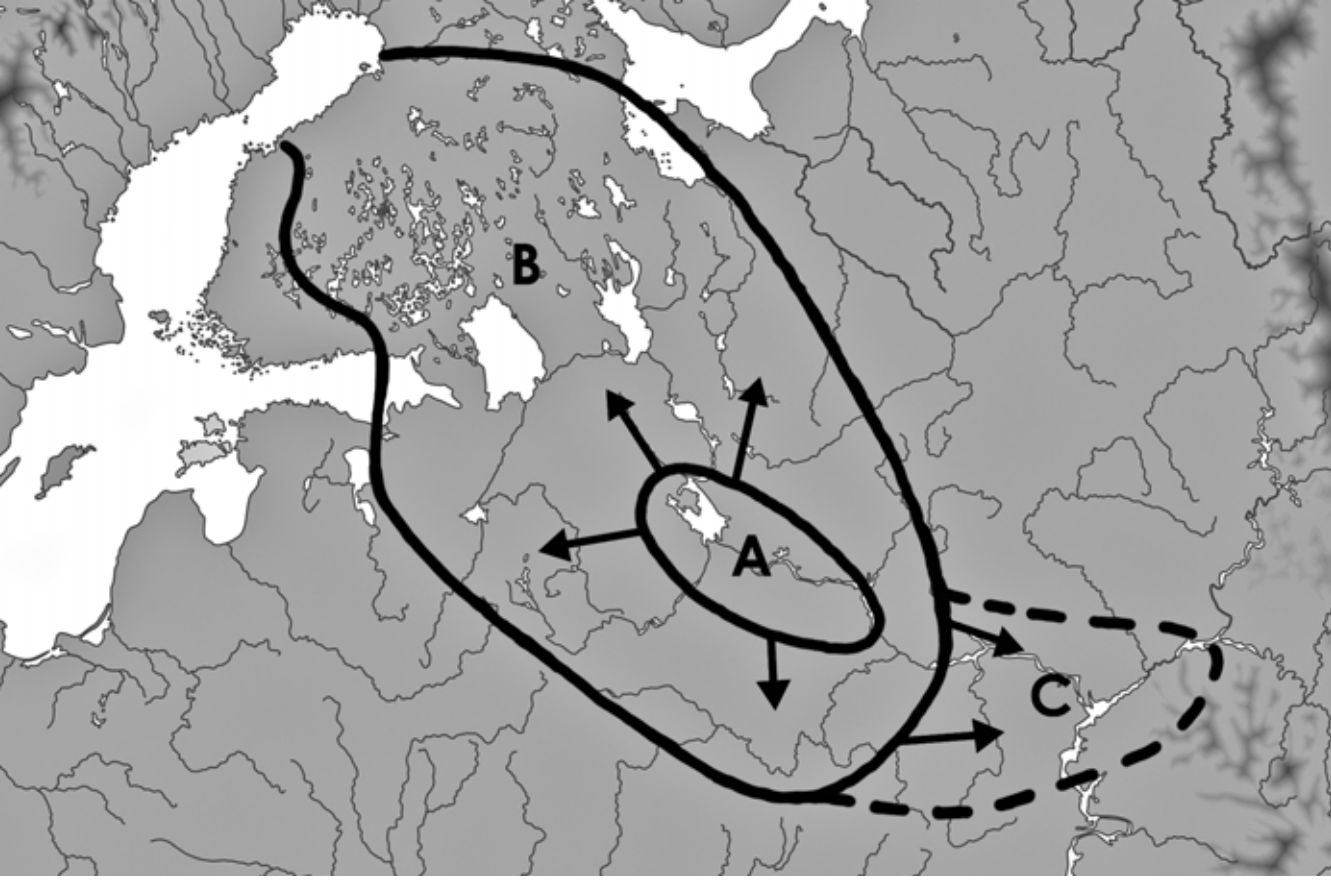


Figure 8. Distribution of the Netted Ware according to Carpelan (2002: 198). A: Emergence of the Netted Ware on the Upper Volga c. 1900 calBC. B: Spread of Netted Ware by c. 1800 calBC. C: Early Iron Age spread of Netted Ware. (After Carpelan 2002: 198 > Parpola 2012a: 151.)

> been thought, but in the opposite direction, taking the Proto-Finnic language to Estonia (Estonian) and then further to Courland (Livonian) and to Latvia (the Finnic superstratum whose assimilation to the local Baltic speakers led to the differentiation of Lithuanian and Latvian). (Parpola 2012a: 153).

As evidence for the immigration of a new culture (and not just traded goods) brought to the Baltic region (Estonia, Livonia, southern coast of Finland and central Sweden around Lake Mälaren) from western Russia, I mentioned, in addition to the bronze axes of the Akozino-Mälar type, a new eastern type of burial (the so-called *tarand* graves), hill forts similar to the *gorodishche* of Early Iron Age western Russia, and other related materials, as well as initiation of a new type of pottery (Ilmandu ceramics in Estonia, Morby ceramics in Finland). (Parpola 2012a: 151–155.) Coming from the Netted Ware culture that occupied roughly the speaking area of Mordvin, and with a short stay in the area of the future Mari speakers, the immigrants would have had the proper Volga-Finnic linguistic background.

The basic thesis of this new hypothesis – that the main thrust of the Finnic immigration into the Baltic region came from Russia with the Akozino-Mälar axes (Fig. 10) and the cultural features mentioned above – was fully accepted by Valter Lang in 2015 in his article "Formation of Proto-Finnic – an archaeological scenario from the Bronze Age / Early Iron Age". Lang had refrained from discussing the problem

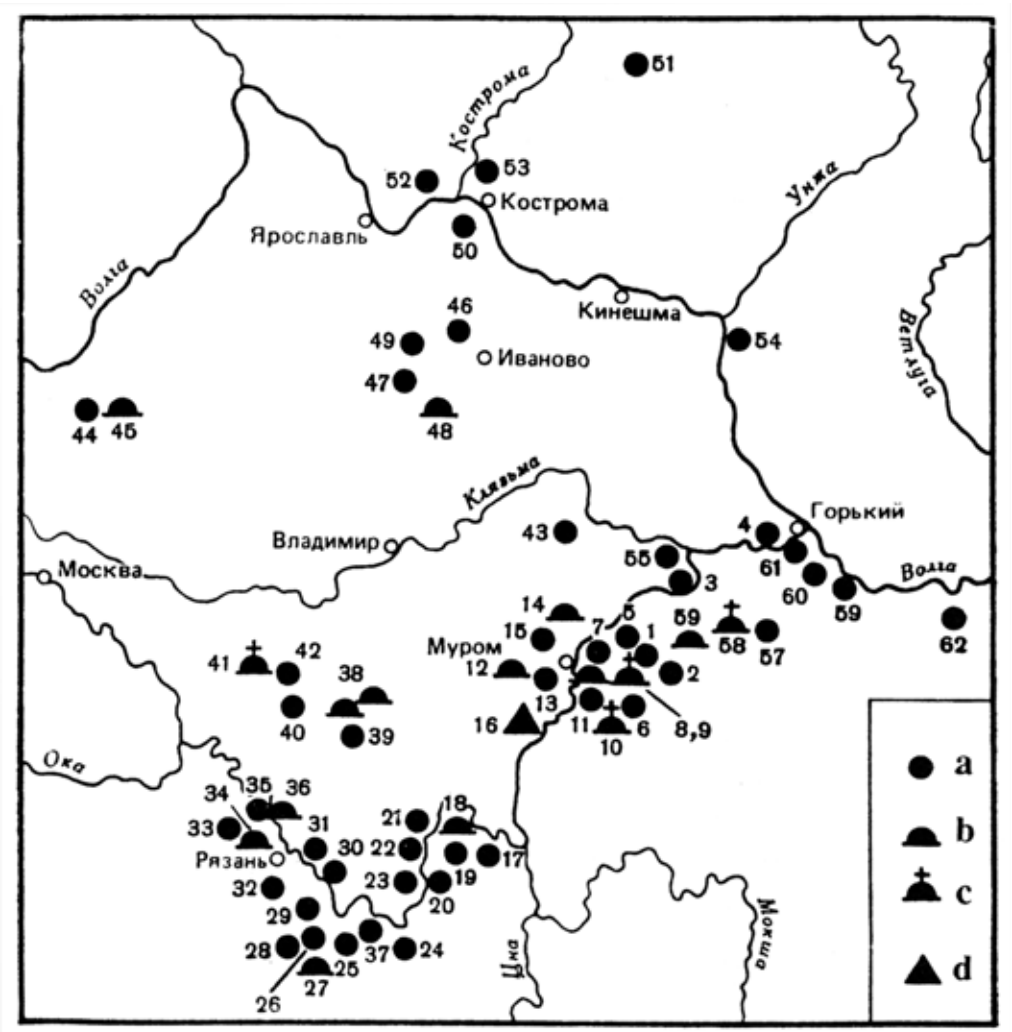


Figure 9. Distribution of the principal sites of the Pozdnyakovo culture in the upper Volga and Oka basins. a = habitation site, b = cemetery of kurgan burials, c = cemetery of interment burials, d = hoard. (After Bader, Krajnov & Kosarev 1987: 132, map 24.)

of Proto-Finnic immigration in his excellent monograph "The Bronze and Early Iron Ages in Estonia" (2007), but as a leading specialist of Estonian archaeology he has now in recent articles (Lang 2015, 2016; Lang & Pajusalu 2017) refined and rectified my model. Most importantly, Lang rejected my suggestion that the Saami speakers came to Finland a millennium earlier with the northern expansion of the Netted Ware, and its corollary, that all the immigrants belonged to the Finnic branch. Instead, Lang proposed that the northwestern import route of the Akozino-Mälar axes was used by speakers of the Saami branch, while the southwestern route via the Daugava Valley was used by speakers of the Finnic branch. I am happy to accept this proposal of a simultaneous immigration of the Saami and Finnic branches to the Baltic area, which neatly agrees with the linguistic evidence.

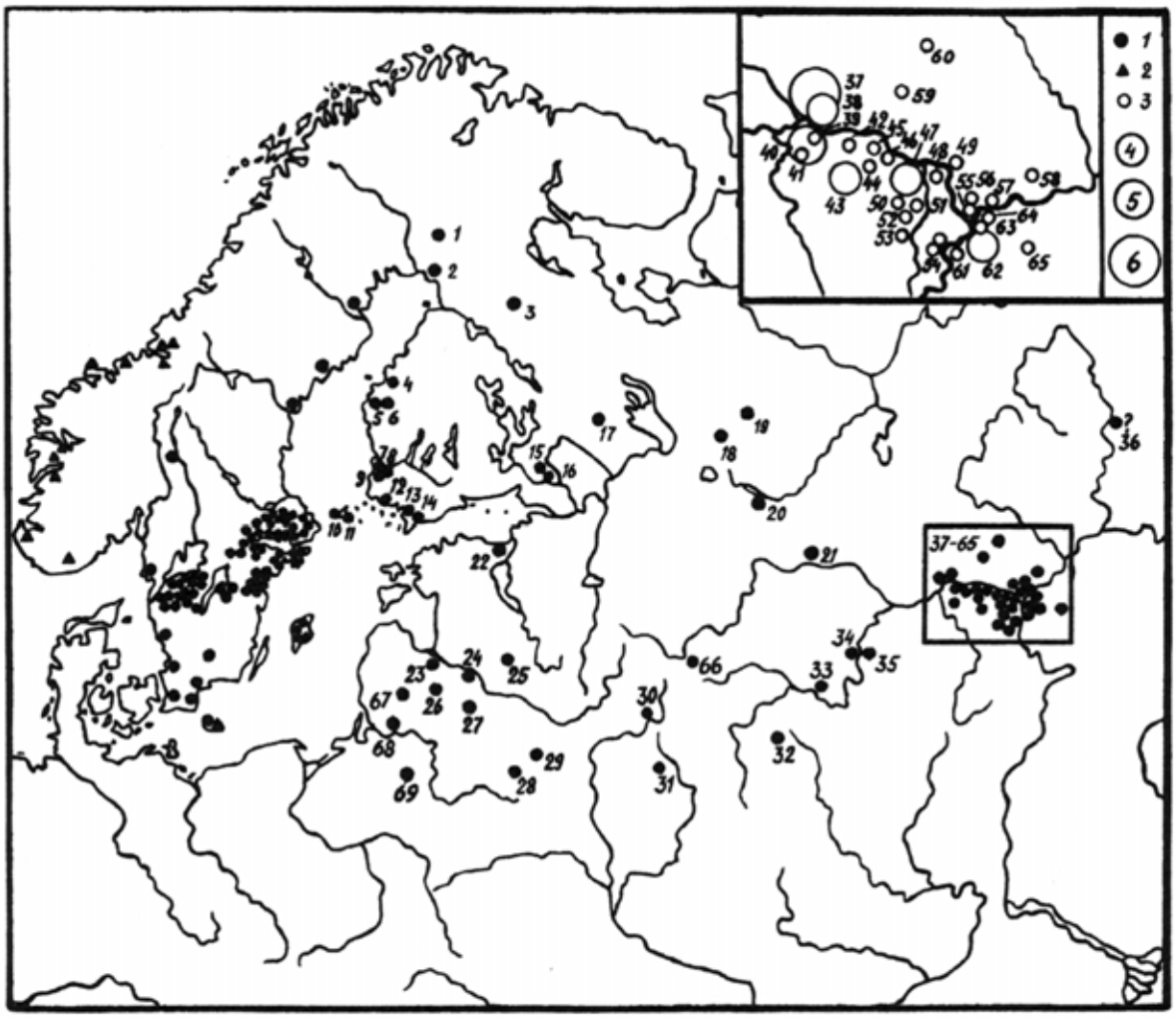


Figure 10. Distribution of the Akozino-Mälar axes according to Sergej V. Kuz'minykh. (After Kuz'minykh 1996: 8, Abb. 2.)

Commenting upon the present paper, Riho Grünthal expressed his doubt that the Saami and Finnic branches would have arrived from inner Russia to the Baltic region as already differentiated languages. He sees their formation and final separation as taking place only in the Baltic area:[4] according to Grünthal, the issue is primarily about the immigration routes and dating. In Petri Kallio's opinion, however, West Uralic was already divided into three branches when the Finnic moved to the south-west, Saami to the northwest, and Mordvin (a little later) to the east. The later spread of Finnic Kallio sees best explained from a homeland in southern Estonia.[5]

At present, my position on this matter is the following. The differentiation of West Uralic (Volga-Finnic) started around 1000 BCE with the eastward expansion of the Netted Ware. The Mordvin branch stayed in the old homeland and continued the traditions of

4. This is actually also the view of Valter Lang (2015: 73).
5. Kallio has discussed the dispersal of Proto-Finnic in numerous papers downloadable at <https://helsinki.academia.edu/PetriKallio> and in Kallio (2014).

the Netted Ware, while the eastern extension of the Netted Ware developed into the Akozino-Akhmylovo culture 1000–800 BCE, becoming the original homeland of those branches of West Uralic that almost immediately started spreading westwards, the main thrust being marked by the presence of Akozino-Mälar axes 800–500 BCE. The Finnic and Saami branches started splitting from each other only around 500 BCE when this westward movement was accomplished. The Finno-Saamic proto-language could thus be dated between 1000–500 BCE. The Finnic branch then formed in Estonia, starting from the south, and absorbed there many loanwards from Baltic, the main local language since the arrival of the Corded Ware, but also from Germanic spoken in the coastal areas.

With regard to Saami, it has always been thought – and this is also what Lang (2015: 68) proposes – that the Saami branch formed in Finland and Karelia and spread to Scandinavia via Lapland. I have considered an alternative – that the Saami branch formed in central Sweden and then spread northwards from that homeland:

> The Saami […] languages are spoken in an area stretching from Dalarna in central Sweden to the tip of the Kola Peninsula in Russia. All the languages in the area are fairly similar in structure and basic vocabulary. Although there are no deep linguistic boundaries, one can distinguish between ten Saami languages which differ from each other to the same degree as the Germanic or Romance languages. Neighboring dialects on each side of a language boundary are normally close to each other in vocabulary, so that the Saami languages form a chain in which speakers of adjacent dialects understand each other rather easily. The central dialects of Saami differ from each other to the extent that mutual understanding requires a fair amount of practice. (Sammallahti 1998: 1.)

Evert Baudou (1960: 174–175) counted as many as 86 ‘Mälar type’ (B1) axes in Sweden, most of them coming without context from the Mälaren area where they had probably come in around 800–600 BCE both through the Daugava Valley and through southern Finland and the Åland Islands. Among the 269 Akozino-Mälar axes of the Volga-Kama area counted by Sergej Kuz′minykh (1996: 9), there are 26 of his ‘KAM-4 type’ that matches the ‘Mälar type’ of Baudou. (See also Yushkova 2012.) Stressing that, so far, no moulds have been found in Sweden, Lang (2015: 77–79) suggests that the Mälar axes came to Sweden from Estonia just as trade goods. However, there are several indications that the axes were brought there by immigrants from the east.

The only axe found in archaeological excavations comes from a habitation site at a hill fort in Darsgärde, stratified under a layer belonging to Early Iron Age, together with ‘striated pottery’ that has been compared with the contemporary Morby pottery of southern Finland and the Ilmandu pottery of Estonia (Ambrosiani 1959; 1964; Eriksson 2009: 248; 2012: 195; Ojala 2016: 194–195). Eriksson (2012: 195) observes that at Darsgärde,

> […] pots of more local type were also found at the site (e.g. rusticated jars and burnished bowls), but they are in a minority (Reisborg 1989). The pottery at the site is so deviant in Scandinavia that it is impossible to explain it without considering

> immigration. There are several sites with pottery, especially with striated surfaces and decorated with pits […] The sites are mainly distributed in the eastern part of the region but also appear around Uppsala […] Striation is common in the region around Lake Mälaren at the end of the Bronze Age until the Roman Iron Age. It is in a minority at most sites, but it is so common […] Striation became part of the local culture in the Mälaren basin […] (Eriksson 2012: 195–196).

Not only axes, hill forts and related pottery, but also *tarand* graves, are found in the Mälaren area (Feldt 2002; 2005). The symbiosis of these immigrants with the local population would be a good explanation for the great number of early Germanic loanwords in Saami, which have been studied especially by Ante Aikio (2006) and Jaakko Häkkinen (2010 [2]). The archaisms of South Saami to which Häkkinen (2010 [2]: 9–10) has drawn attention[6] is another linguistic feature that could hint to a southern homeland of Saami. In this scenario, the later expansion of Finnic to Finland would have submerged a lost fourth branch of West Uralic.

However, such hunches can be deceptive.[7] Only the traditional view according to which Saami formed in Finland and Karelia can explain the very numerous Saami loanwords from Finnic and many toponyms attesting Saami sound changes: this linguistic evidence is convincingly presented by Ante Aikio (see references, especially 2009 and 2012b). But survival of Proto-Finno-Saamic in the Mälaren region until the arrival of Saami from the north could explain the divergent archaic features of South Saami (e.g. Ylikoski 2018).

3. An early Finno-Ugric loanword from early Indo-Aryan

The above correlations of archaeological cultures with language groups suggests that Proto-Finno-Ugric was spoken with early Indo-Aryan in the Abashevo culture and the Sejma-Turbino trade network between 2200–1900 BCE, and that Proto-Finno-Ugric constitutes the oldest phase of West Uralic. If this hypothesis is correct, all Aryan loanwords in Proto-Finno-Ugric go back to the Indo-Aryan branch. But it has been very difficult to identify among the early Aryan loanwords in Finno-Ugric languages items that come from the Indo-Aryan branch and not from Proto-Indo-Iranian or Proto-Iranian.[8] Are there any such items to corroborate the hypothesis?

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6. Häkkinen proposed that South Saami speakers might have migrated early on over the Baltic Sea from Finland to Sweden, instead of having reached there via Lapland.
7. Without consulting the evidence presented by Ante Aikio (see references), I was rash enough to present this alternative for the formation of Saami as possible at the "Split" conference held at the University of Copenhagen in September 2017, where I spoke about "The split of Indo-Iranian". I am grateful to my anonymous referee for asking me to reconsider.
8. This applies also to the words cited in the recent paper of Napol′skikh (2014), to which my referee has drawn my attention. In the wake of V. A. Abaev and E. A. Khelimskij, Napol′skikh suggests that Finno-Ugric languages were in contact with Indo-Aryan, but specifically the Indo-Aryan spoken in the second millennium BCE in the Andronovo cultures (see figs. 5 & 11).

One fairly clear case seems to be the compound **mete-śišta* 'beeswax', which has reflexes in Mordvin, Mari, Udmurt and Komi (for details see Carpelan & Parpola 2001: 122–126). This compound has an exact match in Sanskrit *madhu-śiṣṭa-* 'beeswax' (lit. 'what is left over of honey'), attested in Rāmāyaṇa 5,60,10, while some other Sanskrit texts have closely related synonyms, *madhūcchiṣṭa-* and *madhuśeṣa-*. Moreover, the latter part of the compound is the past participle of the Indo-Aryan verb *śiṣ-* < **śiš-* 'to leave (over); be left, remain', which appears to have no counterpart in the Iranian branch.[9] The etymology attests to the existence of the RUKI-rule (according to which **s* > **š* after **r, *u, *k* and **i*) that Indo-Iranian has partly in common with Balto-Slavic (Kobayashi 2004: 149–151). The Abashevo culture was in contact with the Fatyanovo and Balanovo cultures, East European varieties of the Corded Ware complex, that, with great probability, had early Balto-Slavic as their language (Anthony 2007: 379–385). Wax was needed for cire perdue casting of animal and anthropomorphic figurines of the Sejma-Turbino metalwork (Chernykh 1992: 203–204, 228), and the region where honey and wax could and was produced was above all the forested region of Russia between Mid-Volga and the Urals (Carpelan & Parpola 2001: 114–122).

4. Proto-Finno-Ugric **waća* or **waćća*: Phonological considerations

Károly Rédei (1988 UEW I: 547) reconstructs **waća* 'stomach' to the Finno-Ugric protolanguage (PFU), but considers this reconstruction uncertain, because on the Ugric side the word *waś* 'stomach' is known only from a single (i.e. the northern) dialect of the Mansi (Vogul) language and because, according to Rédei, the quality of the vowel is uncertain. Proto-Mansi **ć* (inherited from PFU **ć*) has changed into Modern Mansi *ś* (Sammallahti 1988: 512), and other authorities (Collinder 1955: 123; SKES 1978, VI: 1677; SSA 2000, 3: 419a) have been convinced of the word's PFU origin. The vowel *a* in present Mansi dialects can come from several different vowels of Proto-Mansi (Juha Janhunen, personal communication; Sammallahti 1988: 506). Petri Kallio pointed out that PFU word-initial **wa-* has regularly become **u-* in Proto-Mansi, particularly in *a*-stems: **wajo-* 'sink' > **uj-*; **wančа-* 'move cautiously'> **unš-*; **wara* 'edge, ridge' > **ur* (Sammallahti 1988: 551; Reshetnikov & Zhivlov 2011: 104; Aikio 2015: 56–57). According to my anonymous referee, this is indeed a common development, but other different changes have also taken place, such as **wača-* 'to scrape, scratch' > MSo. *osɣ-* (UEW I: 549); **wačɜ-* 'intelligence, memory' > MSo. *os* (UEW I: 550), **waδ′kɜ* 'bend of river' > MSo. *wɔɔl′-* (UEW I: 550); **wajće* 'duck' > MSo. *wās* (UEW I: 552); **walka-* 'to land, to descend' > MLO *wāɣl-* (UEW I: 554); and **waśke* 'metal' > MSo. *at-wəs* (UEW I: 560). Rédei's hesitation in deriving North Mansi *waś* 'stomach' from PFU **waća* 'stomach' is therefore justified, but the etymology does not seem impossible.

9. Hintze (1994: 457) and Werba (1997: 243 no. 195) connect Sanskrit *śiṣ-* with Avestan *siiazd-*/*sižd-* 'to distance from, recede, chase away'; but Lubotsky (2004) and Cheung (2006: 343) link Avestan *siiazd*/*sižd-* etymologically with Sanskrit *sedh-* and Latin *cēdere*.

In my opinion, the precisely identical meaning ‘stomach’ linking the Mansi word with Finnic **vatsa* ‘stomach’ supports the comparison.

At the other end of the language family, the word is attested in the Finnic branch as follows: Finnish *vatsa*, Karelian *vattša*, Ludic *vatš*, Veps *vac*, Votic *vattsa*, Estonian *vats*, Livonian *vatsā*,[10] all with ‘stomach’ as the basic meaning.[11] The PFU reconstruction should, however, be **waća*/**waćća* instead of Rédei’s **waća*. Petri Kallio notes that if the Mansi word is dismissed, the PFU reconstruction should be just **waćća,* where the geminate *-ćć-* is a natural replacement of Aryan *-ts-*, which was a long consonant cluster (cf. Pāli and Prakrit *vaccha-*) and not a short (ungeminated) affricate. As PFU lacked the consonant cluster **ts*, as well a dental affricate **c*, Aryan **-ts-* had to be substituted with the geminated palatal affricate **-ćć-*. In “Early Proto-Finnic” (the ancestor of the Finnic and Saami branches ± Mordvin), PFU **ć* / **ćć* lost its palatalization, becoming the dental affricate **c* / **cc*, which in turn became *s* / *ts* in Finnish (Koivulehto 1999: 219 = 2016: 221; Kallio 2007: 233; Lehtinen 2007: 95–97). If the Mansi evidence is discarded, Early Proto-Finnic **vacca* could in theory be derived directly from Proto-Indo-Aryan **vatsa-*, without going back to PFU, that may lack the support of Mansi; this alternative, however, seems excluded by the archaeological evidence. It is out of the question that **waćća* or **vacca* was borrowed from Proto-Indo-European, where the word had the shape **wetsó-*, in which form it probably still survived also in early Proto-Indo-Iranian, as we shall see.

10. Petri Kallio has modernized the references to accord with the current dictionary forms. He notes that the etymological dictionaries quote for Livonian only *vats*, which is a loan from Estonian, and fail to record Livonian *vatsā* inherited from Proto-Finnic.

11. In addition, there are the following words in Mordvin, whose relationship with Finnish *vatsa* has been considered uncertain for phonological and semantic reasons (cf. SKES 1978 VI: 1677; Rédei 1988 UEW I: 547; SSA 2000, 3: 419a). I owe the following comments to Riho Grünthal. Principally, Mordvin words should be cited as they are presented in Paasonen’s Mordwinisches Wörterbuch (1990–99). In this case, the key words and literary variants are E (= Erzya dialect) *vačo*, M (= Moksha dialect) *vača*, which can be derived from Proto-Volga-Finnic **vača* (the PFU form would be the same). The meaning is ‘hunger, hungry’, not too far from ‘stomach’. The derivative E *vačodo* ‘hungry’ (+ M) is an adjective (with the old **(e)tA* suffix), while the plain E *vača* functions as an attribute without adjectival markers. The same stem is also used as a verb: E *vačoms* ‘to be hungry’ (+ M). The verb is often used in association with the word for ‘stomach’, E *peke*, M *pekä*, e.g. *pekem vačs'*, literally ‘my stomach became hungry’; in addition to those mentioned by Rédei (1988 UEW I: 379), Mordvin *peke* has a cognate in Veps, *pöko* (< **pekkV*) (VeK *pököiš om kiškad i pärmin* ‘mahassa ovat suolet ja perna’, SUST 86: 270), and in Karelian, *pökkö*, *pökki* (SKES 1962 III: 694). The affricate *č* of Mordvin *vačo*, *vača*, however, goes back to PFU **č* and thus differs from the PFU **ć* reflected in Finnic words. The Mordvin words are of a separate and apparently more recent origin, because in old Uralic vocabulary the two dialects usually have different reflections of PFU **č* (E *č* M *š*), but in this word both have *č*. The expected lenition into sibilant in Mordvin has taken place also in the Aryan loanword E *čari*, *čaro*, M *šari* < Proto-Mordvin **čara* ‘wheel, ring’ (on this word see also Grünthal 2008). Cf. Keresztes (1987 I: 143–144): ”... Aufgrund dieser Fakten kam ich zum Schluß, daß das wortanlautende *č und *š in der zweiten Hälfte der FV-Periode ... zusammenfielen bzw. frei wechselten ... Diese Erscheinung widerspiegelt sich in den heutigen Dialekten auf verschiedene Weise ... im Erzanischen wurde č verallgemeinert, im Mokschanischen š.” – Petri Kallio observes that Proto-Mordvin **čara* comes rather from Iranian **čaχra* than Indo-Iranian/Indo-Aryan **cakra*, because the cluster k + liquid would have resulted in a metathesis in Mordvin (cf. PFU **śüklä* > Mordvin E *ćil'gä*, M *śil'ge*), while the Iranian spirant *χ could be left without substitution as it had no exact counterpart on the Uralic side.

5. Finnish *vatsa* and Sanskrit *vatsá-*: bridging the semantic gap

Finnish *vatsa-* has been considered a native Finno-Ugric word. One circumstance undoubtedly favouring this conception is that the word denotes a body part, known to belong to the most conservative portion of the lexicon (cf. also Hakulinen 1968: 252). Yet I am really surprised that, in spite of their great phonetic similarity, nobody seems to have earlier proposed that it actually is an early Aryan loanword, borrowed either from Proto-Indo-Iranian **vatsá-*, or rather (as discussed below), from Proto-Indo-Aryan **vatsá-*.

Of course, the main reason why these so similar Finno-Ugric and Aryan words have so far not been connected etymologically is their semantic difference. Yet this difference can be reasonably bridged. In Indo-Aryan, the word *vatsa-* and its derivatives have two principal meanings: 'calf' and 'year'. Already in the earliest Sanskrit text, the Ṛgveda, *vatsá-* means 'calf' and 'child' (Grassmann 1996: 1199), and these meanings are found in later Sanskrit literature as well. In the sense 'child', it is often used in the vocative as a term of endearment, 'my dear, my babe'. Sanskrit literature also has various derivatives like (with the diminutive suffix *-ka-*) *vatsaka-* (m.) / *vatsikā-* (f.) 'little calf, heifer', (with the comparative suffix *-tara-*) *vatsatara-* 'weaned calf, very young calf', *vatsala-* '(cow) attached to her calf, loving, tender, compassionate'. (Böhtlingk & Roth 1871, VI: 645–646; Macdonell 1924: 267c). These words are inherited into Middle Indo-Aryan with the change *ts* > *cch* (Pali and Prakrit *vaccha-, vacchaka-* 'calf') and into the various Modern Indo-Aryan languages (Turner 1966: 655–656 nos. 11239, 11241, 11244). In the meaning 'year', Sanskrit *vatsa-* is attested only by lexicographers and in the Vedic compound *tri-vatsá-* 'three years old', but it is present in the Ṛgveda (4,33,4) with the prefix *sam-* in the expression *saṁvátsam* 'for one year'. The derivative *vats-ará-* is attested in Vedic texts as the name of a particular year in a longer time cycle, and it is continued in Middle Indo-Aryan (Pali & Prakrit *vacchara-* 'year'), but the usual Sanskrit word for 'year' is *saṁvatsará-* (Turner 1966: 656 nos. 11240, 11242; 753 no. 13011).

Both meanings, 'calf' and 'year', go back to Proto-Indo-European, where the basic word was **wet* 'year' (Hittite *witt-* 'year') and its enlargement **wet-es-* n. 'year' (Greek *wétos, étos* 'year'; also Latin *vetus,* gen. *veteris* 'old').[12] PIE **wetes-* was further enlarged with an accented thematic vowel (with or without loss of the preceding short vowel) into **wet(e)s-ó-*; this meant either 'yearling' (one year old animal or child) or 'bejahrt', i.e. '(many) years old'. Besides Indo-Iranian (Sanskrit *vatsá-* 'calf'), the derivative **wet(e)s-ó-* appears to be reflected in Albanian *viç* / *vitsh* 'calf', Lithuanian *vẽtušas* 'old' and Old Bulgarian / Old Russian *vetъchъ* 'old' (Frisk 1960 I: 583–584). Other derivatives of PIE **wet-* with the meaning 'yearling, one-year-old animal' are Greek *ételon / étalon* and Latin *vitulus* 'calf' and Umbrian *vitluf* 'vitulos', Gothic *wiþrus* 'sheep yearling, lamb of one year' (< PIE **wet-r(u)*), and Albanian

12. My anonymous referee thinks it useful to point out that Koivulehto (1999a: 218 = 2016: 220) has posited Proto-Aryan **vatas-* 'year' as the source of Proto-Uralic **wotV* 'year', even though Aikio (2012a: 233–234) has refuted this etymology by demonstrating that the Proto-Uralic reconstruction should be **ïdi* 'year/autumn'.

vjetë f. ‘calf’ ~ Albanian *vit* (sg.), *vyet* (sg. & plur.) ‘year’ (Pokorny 1959 I: 1175; Vasmer 1953 I: 194; Frisk 1960 I: 579–580; Mayrhofer 1996 II: 495).

The Finnish word *vatsa* with its direct cognates in other Finnic languages denotes besides ‘stomach’ also ‘womb’, and the adjectival derivatives *vatsakas, vatsava,* etc. mean both ‘big-bellied’ and ‘pregnant’; in Veps, there is a verb *vatstuda* ‘to become pregnant’ (of women) (SKES 1978 VI: 1677; SSA 2000 III: 419). In the Finnish folk epic Kalevala (songs 1, 45 and 50), the following formulaic phrase describes the pregnancy of a woman: *kantoi kohtua kovoa, vatsantäyttä vaikeata* ‘she was bearing a hard womb, the difficult fullness of stomach’. Finnish dialects have the derivative *vatsain* denoting the ‘external female organ of the cow’. In various Indo-European languages, many words for ‘stomach, belly’ also mean ‘womb’ (see Buck 1949: 252–254). English *child* ‘young human being’ is etymologically “related to Gothic *kilþei* ‘womb’ and *in-kilþō* ‘pregnant’, quasi ‘fruit of the womb’ ” (Onions ed. 1966: 169b; cf. Pokorny 1959: 358). Greek *delphús* (gen. *-úos*) f., (Doric) *delphúa* f. ‘womb’ corresponds to Avestan *gərəbuš-* n. ‘young animal’, while Greek *dolphós* ‘womb’ agrees with Sanskrit *gárbha-* m. ‘womb, embryo, foetus, newborn baby, child, offspring’ – Neo-Indo-Aryan cognates also mean ‘womb / pregnancy (especially of animals), foetus (of animals), young calf’ (Turner 1966: 217 no. 4055) –; and with Younger Avestan *garəβa-* m. ‘womb’ (Frisk 1960 I: 362; Mayrhofer 1992 I: 474). Petri Kallio has drawn my attention to the convincing etymologies of English *calf* and its Germanic cognates by Jorma Koivulehto (1973: 7–11 = 2016: 22–26) that connect the amniotic bag and womb with the embryo. These meanings and parallels effectively bridge the gap between Old Indo-Aryan *vatsa-* ‘calf, infant child’ and Finnic *vatsa-* ‘stomach, belly, womb’.

”Having lain for ten months within his mother, let the boy [*kumāra-*] come out, alive and unharmed – alive from his living mother” (Jamison & Brereton 2014 II: 761), prays the Ṛgvedic stanza 5,78,9. Ten months is mentioned as the time of pregnancy also in Ṛgveda 5,78,7.8; 10,184,3; Atharvaveda Śaunaka 1,11,6; 3,23,2; and in later Vedic texts. It is significant, however, that in several places of Vedic Brāhmaṇa texts, a year is mentioned as the standard time of pregnancy: PB 10,1,9 *saṁvatsaraṁ hi prajāḥ paśavo ‘nu prajāyante “*for after a year (of pregnancy) the children and (young) cattle are produced (born)” (Caland 1931: 229). “In a year a seed that has been laid is born”, says Kaṭha-Saṃhitā 33,8. According to Śatapatha-Brāhmaṇa (ŚB) 6,1,3,8, the creator god Prajāpati, equated with the Year, laid seed into Uṣas, the Dawn; “there a boy (*kumāra*) was born in a year” (Eggeling 1894 III: 158–159). ŚB 11,5,4,6, dealing with the teaching of the *sāvitrī* verse at the initiation of a Brahmanical student (the initiation being considered his “second birth”), notes: “formerly, indeed, they taught this (verse) at the end of a year [from the beginning of the initiation], thinking, ‘Children, indeed, are born after being fashioned [in the womb] for a year [*saṃvatsarasaṃmitā vai garbhāḥ prajāyante*]: thus we lay speech (voice) into this one as soon as he has been born” (Eggeling 1900 V: 87–88). According to this view, the boy is one year old, a yearling, when he comes out of the womb; and indeed some Vedic texts (e.g. Gobhila-Gṛhyasūtra 2,10,1–3) count the age from conception. Thus *vatsa-* ‘year’ = pregnancy (= [big] ‘stomach’ = Finnish *vatsa*) = *vatsa-* ‘yearling’ = the newborn child or (one year old) calf.

6. Indo-Aryan *vatsa-* ~ Iranian *vasa-* and the split of Indo-Iranian

One further reason why the affinity of Finnish *vatsa* 'stomach' and its cognates with Sanskrit *vatsá-* 'calf' has remained unnoticed so long is undoubtedly the fact that other related Finno-Ugric words with the meaning 'calf' have long since been recognized: the first to connect Finnish *vasa* 'calf', diminutive *vasikka*, and cognates with Sanskrit *vatsa-* 'calf' seems to have been Lorenz Diefenbach (1851 I: 60; cf. Joki 1973: 20–24). But while Finnish *vatsa* and cognates have probably been inherited from Proto-Finno-Ugric, Finnish *vasa* and cognates go back only to Proto-Volga-Finnic, the reconstructed protoform being **vasa*:[13]

- Finnish *vasa* 'calf' (of cow, moose, reindeer), diminitive *vasikka, vaska*; also *vasa, vasain, vasasin, vasatin* 'external generative organ of the cow', *vasoa* & *vasikoida* 'to bear a calf'
- Karelian *vasa*;
- Ludic & Veps *vaza*;
- Votic *vasa, vazikka*;
- Estonian *vasik*, *vasikas* 'calf', *vasutin* 'external generative organ of the cow';
- Livonian *va'(i)ški* ;
- Saami (Inari) *vyesi* (with cognates in many other dialects) 'calf' (of reindeer);
- Mordvin (Erzya, Moksha) *vaz,* (Moksha) *vaza* 'calf'.

It is agreed that Volga-Finnic **vasa* is derived from Old or early Middle Iranian **vasa-* (with Proto-Iranian **s* < Proto-Aryan **ts*), which is attested with diminutive variants **vasaka-* and **vasyaka-* as follows:

- Ossetic (Digor) *väs / väss* (plur. *väsitä*) 'calf' (< **vasa-* / **vassa-*)
- Khotan Saka *basaka-* 'calf' (< **vasaka-*)
- Choresmian *vsyk* = **vasīk* 'calf'
- Middle Persian (Pahlavi) *vhyk* = **vahīk* 'kid' (< **vaθīk* < **vasīk*) > Modern Persian *bahī* 'kid'
- Larestani Persian (of southeastern Iran) has the compound *go-vas* 'calf of the cow'
- (Pamir) Vakhi *vəšk, vušk* 'calf' (< **vasyaka-*)
- (Pamir) Sariqoli *višk* 'calf' (probably < Vakhi *vəšk, vušk* 'calf')
- (Pamir) Sanglechi *vasök* 'calf'
- (Pamir) Yazghulami *vůs* (< *vas*) 'calf', plur. *vasaθ*

13. It is nowadays agreed that the related Ob-Ugric words denoting 'calf' (Mansi alias Vogul *vãsəj*, *vãsəγ*, *vãsiγ* (< **vãsək* / **vasək*) 'calf' (of moose or reindeer) have been borrowed later from different Middle Iranian languages and cannot be connected with Proto-Volga-Finnic **vasa*: their *-s-* < PFU **ś*, while PFU **s* > Mansi *t* (Joki 1973: 338–339; SKES 1975 V: 1665a; SSA 2000 III: 414). My anonymous referee points out that Hungarian *üsző* (with several dialectal variants) 'female calf that has not yet given birth' is currently considered as belonging as a derivative to the inherited Uralic lexicon (cf. Rédei 1988: II, 848; the Hungarian word is omitted in SSA 2000 III: 414).

- (Pamir) Ishkashmi *vůsuk* ‘calf’
- Yaghnobi *vása, vasák* ‘calf’
- Parachi *γasə̄* ‘calf’ (< **vasaka-*)
- Ormuri (Logar) *γusī, γuskák*, (Kaniguram) *γvac* (Grierson 1921) / *γvas, γvos* (Morgenstierne 2003: 30) ‘calf’ (< **vasa-*, cf. Balochi *gvask*; cannot have been borrowed from Pashto)
- Pashto *γuckáy* ‘steer, large calf’
- Balochi *gvask* ‘calf’ < **vasaka-* (for **va-* > *gva-* cf. Elfenbein 1989: 354)
- (Joki 1973: 338–339 no. 197; SKES 1975 V: 1664–1665; Koivulehto 2001: 361, 370 = 2016: 259, 268; SSA 2000 III: 414b; Morgenstierne 1974: 93; Morgenstierne & al. 2003:30; Bailey 1979: 274a; Abaev 1989 IV: 97–98; Steblin-Kamenskij 1999: 399–400.)

The change of Proto-Aryan **ts* into **s* that characterizes these Iranian counterparts of Sanskrit *vatsá-* has taken place already in (Pre-)Proto-Iranian. Ralph and Dorothy Turner (1971: 169) list all the Old Indo-Aryan lexemes containing the sequence *-ts-*; as may be seen from Mayrhofer’s etymological dictionary (1992–2001), all the Old Iranian counterparts of the primary words in these lists have lost **t*: Sanskrit *útsa-* m. ‘spring, well’ ~ Younger Avestan *usa-*; Sanskrit *mátsya-* ‘fish’ ~ Younger Avestan *masiia-*; Sanskrit *kṛtsná-* ‘whole’ ~ (?) Younger Avestan *karsna-* N. pr.

This deletion of **t* before **s* in Proto-Iranian is related to one of the major distinctions between the two branches of Indo-Iranian languages: the divergent development of the PIE sequence dental + sibilant + dental. In Early PIE, when a root-final **-t/-d* was followed by a suffix beginning with a dental stop (which happened very often, since the nominal derivative suffixes **-to-, *-ti-, *-tu-, *-ter-/-tor-* occurred frequently, and so did the primary verbal endings of the 3rd and 2nd person singular, **-ti, *-tu, *-dhi*), a sibilant was introduced between the two dentals: ***tt* > **tst, **dd* > **dzd, ** ddh* > **dzdh*. The sequence **-tst-* has survived in the archaic Anatolian branch, which early on separated from Core PIE: Hittite *ezzi* [éts.tsi] ‘he eats’, written *e-(iz-)za-(az-)zi*, *e-iz-du* [éts.tu] ‘let him eat’. In the Iranian branch, the initial dental was lost (thus **tst* > **st*), while in the Indo-Aryan branch the sibilant in the middle was deleted (thus **tst* > **tt*). The initial dental in the sequence dental + sibilant + dental was lost also in Greek and Balto-Slavic.[14] (Wackernagel 1896 I: 177–178; Porzig 1954: 76–78; Mayrhofer 1986: 110–111; Szemerényi 1989: 108–109; Meier-Brügger 2002: 137–138; Fortson 2004: 63; Tichy 2004: 28.)

Here, Iranian follows the general rule for the simplification of consonant clusters, but Indo-Aryan has developed a special rule for dental clusters:

> A general rule of obstruent cluster simplification from Proto-Indo-Iranian to Indo-Aryan and Iranian seems to be to drop the initial one. […] Against the general rule deleting the first of a cluster of obstruents, Indo-Aryan independently

14. In the Italic, Celtic and Germanic branches PIE **tst* > **-ss-* (e.g. Fortson 2004: 63).

> developed a special rule, ERASURE OF STRAY *s, which stands in a disjunctive relationship with the former; as a 'Elsewhere Case' in Kiparsky's terminology, it has priority over the older and more general rule. Deletion of the middle one in a medial cluster of three obstruents seems to be limited to PIIr. *t followed or preceded by *s. (Kobayashi 2004: 78.)

Masato Kobayashi explains the development thus:

> While other Indo-European languages, and probably late Proto-Indo-European as well, insert an *s between two successive heteromorphemic dental stops *-t-t- and *-d-t-, Indo-Aryan eliminated the /s/ in this environment after it branched off from Proto-Indo-Iranian […]
>
> This insertion of an *s in Proto-Indo-European, or possibly affrication of the first of a cluster of two dental stops, has an effect of preventing the dental stops from forming a geminate. Proto-Indo-European has almost no reconstructible tautomorphemic geminate. When two dental stops adjoin one another in the combination of two morphemes […] the insertion of *s, their continuant counterpart, blocks gemination across a morpheme boundary, which was probably disfavored in Proto-Indo-European phonology.
>
> As we saw in §23 and §24, Avestan strictly disallows gemination, whereas Old Indo-Aryan has geminates in profusion […] Some fundamental change in the restrictions on consonant clusters seems to underlie this divergence, and it must be within Indo-Aryan that the change took place […] (Kobayashi 2004: 37–38)

What could have caused this fundamental change in Indo-Aryan? Kobayashi was apparently thinking of substratum influence, for in a footnote (2004: 38 n. 4) he points out that "unlike Proto-Indo-European, Proto-Dravidian is reconstructed with geminates", and later in his book (pp. 163–191) he examines at length the convergence of Indo-Aryan and Dravidian. Reference to Dravidian makes sense if it is assumed, as has long been done, that the Proto-Indo-Iranian homeland was in southern Central Asia, and that the Indo-Iranian unity split only when Indo-Aryan entered South Asia. This hypothesis, however, cannot come into question in the case of the change **tst* > **st/*tt,* which, as we shall see, was so early that some of the sound changes characterizing Proto-Indo-Iranian had not taken place. I suggest that it was the intensive contact of the early Indo-Aryan speakers with the speakers of Proto-Uralic that brought the change **tst* > **tt* about. In PFU, "the stops **p*, **t*, and **k* could be combined to form geminates" (Sammallahti 1988: 492). PFU gemination of **ć* and **č*, too, had been proposed (Honti 1981) when Sammallahti wrote, but he did not consider the evidence sufficiently valid. The present etymology of *vatsa* supports the reconstruction of **ćć* for PFU*,* which is accepted at least by Koivulehto (1999a: 219 = 2016: 221) and Petri Kallio (see above).

The earlier sketched correlation of archaeology and linguistics makes it possible to understand the cultural circumstances of the Indo-Iranian split and to date the split. The emergence of the Catacomb Grave culture (3000–2000 BCE) in the midst of the

Yamnaya cultural complex (3300–2300 BCE) explains how the Iranian branch could come into being and share the change *-*tst*- > *-*st*- with Greek and Balto-Slavic spoken west and north of it, areas also receiving their metal from North Caucasus, while the eastern Yamnaya culture could still retain the PIE *-*tst*-, to change it to the non-IE *-*tt*- when coming into intensive contact with Proto-Uralic in the 23rd century BCE. Chernykh (2009: 126) notes that the earliest radiocarbon dates (3300–3000 BCE) for the Yamnaya culture come from its eastern and western peripheries, from the Volga-Ural area, and from the northwestern Black Sea coast. Thus the eastern Yamnaya language, the Proto-Aryan ancestor of the Indo-Aryan branch, was likely to be archaic, and this may count also for its preservation of the aspirated stops.

As the Majkop culture (4100–3000 BCE) came into being as the result of the Srednij Stog II expansion into North Caucasus, it may be assumed that the language of its elite was Early PIE. This language, of course, became subject to the substratum influence of the unrelated local language, and one change that can be expected to have taken place in Majkop PIE is the disaspiration of PIE aspirated stops, as these phonemes are rare outside the IE family. The disaspiration of the aspirated stops in the Iranian branch may have resulted from the close relations between the Catacomb Grave culture with the North Caucasian successor of the Majkop culture. Petri Kallio comments that intensive contact with Balto-Slavic could also have brought out the Iranian disaspiration, if an external reason is required.

Proto-Finno-Ugric **vatsa*, then, was borrowed from Proto-Indo-Aryan **vatsá*- that preserves the PIE and PII cluster **ts* against the deletion of **t* in front of **s* in Iranian, parallel to the deletion of **t* in the sequence **tst* in Iranian. Jorma Koivulehto (1979, cited here from the reprint Koivulehto 1999b: 161–168) has identified an Aryan loanword in West Uralic = Proto-Volga-Finnic, a loanword whose PIE and PII original contained the sequence **tst*, with the expected development into *-*st*- in the Iranian branch and into *-*tt*- in the Indo-Aryan branch: PIE **kert*- 'to spin, to draw out and twist natural fibres into a long continuous thread by means of a spindle' + the nominal suffix *-*tro*- denoting an instrument > **kert-tro*- > **kertstro*- > **kētstro*- > **ketstro*- > Pre-Proto-Iranian **kestro*- > **čestro*- > Proto-Iranian **časta*-: the word is attested in Pashto *cāx̌ay* < **časta-ka*- 'spindle'; further Iranian cognates are Waziri Pashto *coša* 'spinning weight', Munji *čēša* 'spindle', and Ormuri (Kaniguram) *tisk* (< **cəs^{a}k*) < **časta-ka*- 'spindle' (Morgenstierne 2003: 19). In Indo-Aryan, Proto-Aryan **kētstro-/*ketstro*- developed into **kēttro-/*kettro*- > **čēttro-/*čettro*-> Sanskrit *cāttra- / cattra-,* 'spindle'. (SKES 1955 I: 176; Pokorny 1959 I: 584; LIV 1998: 317; Koivulehto 1979 = 1999b: 165–166; 2000: 243 = 2016: 247; Rédei 1988 UEW II: 656; SSA 1992 I: 336; Mayrhofer 1996 I: 539; Werba 1997: 170–171.)

In the Volga-Finnic languages, the following words, all denoting 'spindle, wheel of the spindle', are attested (there are also denominative verbs, see SKES):

- Finnish *kehrä, keträ,*
- Karelian *kesrä, kezrä*,
- Ludic & Veps *kezr*,

- Estonian *keder, kedr, kehr*,
- Livonian *kie'ddər*, *kie'drəz,*
- Saami R *kärsi*, Lu *kier'sē, kär'sē*, N *gær'se*,[15]
- Mordvin (Erzya) *šť eŕe*, *štšeŕe* (Moksha) *kšť iŕ*.[16]

The reconstruction of the Volga-Finnic protoform has remained a debated issue. Koivulehto (1999: 165) noted that basically two alternatives have been proposed: **kesträ* or **kešträ,* and since Paasonen (1917: 66) the latter has been favoured on the basis of the Mordvin words. Koivulehto's explanation assumes that the original borrowed into the Volga-Finnic protolanguage was PIE = Pre-Proto-Aryan **kētstro-/*ketstro-,* whose sequence **ts* did not have a counterpart in Volga-Finnic: in the absence of a dental affricate, **ts* was replaced with the affricate **č*, yielding **kečträ,* i.e. **ketšträ,* which was quickly simplified into **kešträ.* Petri Kallio (2012: 231 n. 9) points out that Pre-Mordvin **č* was often metathesized into Proto-Mordvin **št,* and he reconstructs the Volga-Finnic protoform as **kečrä,* as does indeed also Rédei (1988 UEW II: 656): **kečrä* (> **kešträ*).[17]

> Unfortunately, it is harder to decide the regular outcome of Early Proto-Finnic **kečrä*, because there is no other example of Early Proto-Finnic **čr* and because Early Proto-Finnic **č* was subject to a phoneme split into Middle Proto-Finnic **t* and **š* (> Late Proto-Finnic **t* and **h*). Still, the modern Finnic reflexes of this cluster are the same as those of Late Proto-Finnic **cr* and **str*, namely southern **tr*, eastern **sr*, and western **hr* […] (Kallio 2012: 231 n. 9)

While Proto-Indo-Iranian **kētstro-/*ketstro-* may phonologically seem to be the likely source of the Proto-Volga-Finnic word, it seems unlikely from the point of view of archaeology: Proto-Volga-Finnic can be correlated with the Netted Ware culture of the Upper Volga-Oka region, dated to c. 1900–1000 BCE. While its earliest layer of 1900–1800 BCE corresponds to the Proto-Finno-Ugric core derived from the Abashevo culture and the Sejma-Turbino network (both related with the Indo-Aryan branch), the earliest layer of new Aryan loans in Volga-Finnic are likely to come from the Pozdnyakovo variant of the Iranian-related Early Srubnaya culture that became the southern neighbour of the Netted Ware around 1800 BCE.

Earlier I proposed an Iranian derivation of the Volga-Finnic word, which should rather be **kesträ* from Pre-Proto-Iranian **kestro-* (cf. Parpola 1999: 194–195; Koivulehto 1999a: 220). László Honti (1981: 367) indeed also reconstructs **kesträ*,

15. The Saami words also mean 'pig's snout', which suggests that they have been influenced by Finnish *kärsä* 'pig's snout' (cf. Koivulehto 1999b: 164).
16. August Ahlqvist (1871: 74) added to these words Mari *šəðər*, *šüðər*, 'spindle', which SKES (1955 I: 177) compares with a question mark, but which SSA (1992 I: 336) rejects. But could these Mari words not be borrowed from Mordvin?
17. Juha Janhunen is suspicious of three-consonant clusters and would reconstruct **kesrä*, **kešrä* or **kečrä*, which would be realized as *kehrä* and *keträ*, because the cluster *sr* / *šr* / *čr* is not phonotactically correct.

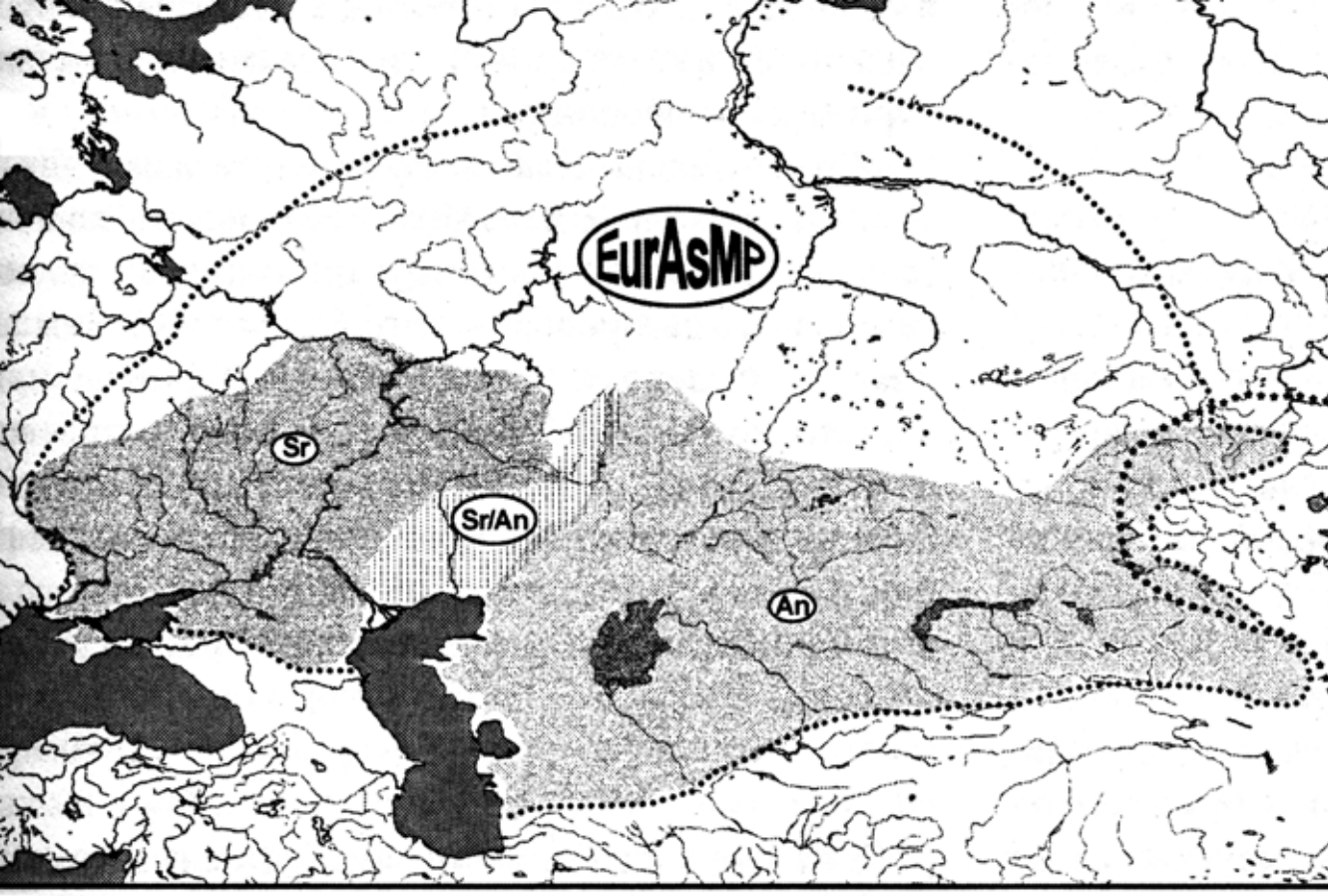


Figure 11. Distribution of the Srubnaya and Andronovo cultures in the Eurasian steppes in the second quarter of the second millennium BCE. (After Chernykh 2008: Fig.11.)

leaving the Mordvin evidence out of consideration.[18] I follow suit, suggesting a later development for Mordvin. Riho Grünthal, while commenting on this paper, has pointed out that the Mordvin words require reconstructing an anaptyctic vowel **-e-* between **t* and **r*. Starting from **kesträ*, we thus get > **kesterä*. This has led to the disappearance of the unstressed vowel of the first syllable (cf. Rédei 1988 UEW II: 656): > **k(e)sterä*. The change **ksterä* > **kšterä* is likely to be due to the analogy of such Mordvin words with reduced first syllable vowel as E *kšna* 'strap', E *kši, kše, kšä* (+ M) 'bread', E *kšni, kšne, kšnä* (+ M) 'iron' (cf. Bereczki 1988: 321.) Next, the word-initial cluster was simplified by dropping *k-*.

The word thus appears to come from the Iranian branch, which at the time of borrowing still had not yet undergone the changes **ke* > **če* and **e, *o* > **a*. There are other Aryan loanwords with only western distribution confirming this, such as Finno-Saamic **kekrä* 'ring, (yearly) cycle' < Pre-Proto-Aryan **kekro-* 'wheel, (yearly) cycle' (< PIE **k^{w}ek^{w}lo-* 'wheel') > Avestan **čaχra-,* Sanskrit *cakra-* (Koivulehto 2000: 241–250 = 2016: 245–254).

18. Three-consonantal **-str-* could be a momentary first stage in the borrowing, to be subsequently variously simplified. Compare the later borrowings Finnish *ahrain*, *atrain*, Karelian *asrain*, Veps *azrag*, *astrag*, 'fish gig' < Russian *ostrogá*; and Finnish *ihra*, Karelian *isra*, Veps *izr* 'fat' < Old Norse *ístr* < **īstra-* < **instra-* (Rapola 1966: 216–218; SSA I 1992: 54b, 222a; Koivulehto 1999b: 161).

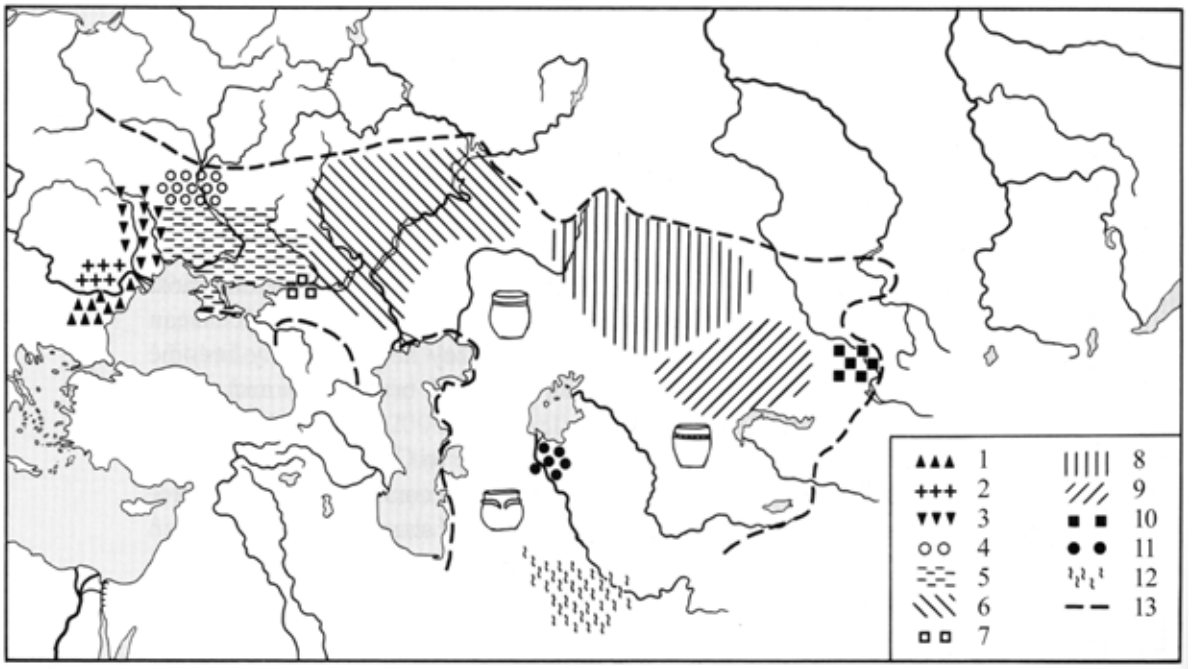


Figure 12. The "Roller Pottery" (Russian valikovaya keramika) cultures 1500–1000 BCE. (After Parpola 2012a: 136 Fig. 4, based on Chernykh 1992: 236 Fig. 79.)

Proto-Aryan **vetsó-* 'calf, infant child', then, is likely to have developed in the Iranian branch into **vesó- > *vasá-,* and in Indo-Aryan into **vetsó- > *vatsá-*. PFU **vaćća-*, therefore, seems to have come from the Indo-Aryan branch after the change **e, *o > *a* had taken place. As the archaeological evidence suggests an early date (2200–1900 BCE) for Indo-Aryan loans in PFU, the change **e, *o > *a* may have taken place first in the Indo-Aryan branch and then spread to the Iranian branch. Archaeology suggests that there was much and intensive contact between the Iranian and Indo-Aryan branches over vast areas in the second millennium BCE, when they were at first represented by the Srubnaya and Andronovo cultures respectively (Fig. 11), with the Andronovo cultures being then submerged by the "Roller Pottery" cultures of Iranian-speaking horse-riders coming from the Pontic steppes (Fig. 12). (The roller pottery developed from the "multi-roller" pottery of the KMK or Babino III culture that succeeded the Catacomb Grave culture in the Pontic steppe.) This mixing of Iranian and Indo-Aryan happened before the earliest literary monuments of Iranian in the form of Avestan texts emerged.

7. Nuristani dental affricate *ċ* [ts] and the position of Nuristani within Indo-Iranian

The voiceless palatal affricate **ć* [tś] of Proto-Aryan was at first preserved in the Indo-Aryan branch and developed then into the palatal sibilant *ś* of Old Indo-Aryan, while in the Iranian branch Proto-Aryan **ć* lost its palatalization, becoming the dental affricate **c* or **ċ* [ts], which seems to have been preserved in the Nuristani languages (in Northeast Afghanistan), while in Old Iranian it became the dental sibilant *s* in Avestan, and the dental spirant *θ* in Old Persian (Mayrhofer 1989: 6; Kobayashi 2004: 73–74; 2012; Lipp 2009; de Vaan 2011). I deal with this development of the voiceless affricates, because Nuristani has substituted the consonant cluster *-ts-* with its dental affricate *ċ* while borrowing Indo-Aryan *vatsa-*, both in the meaning 'year':

- Prasun *vuċū, usċu* 'year' (Turner 1966: 656 no. 11240),

and in the meaning 'calf':

- Kati *vuċúŕ, vaċíṛ*;
- Ashkun *ɔċalä, uċələ́* (< *vatsala-* 'calf') ;
- Waigali *vuċalá* (< *vatsala-* 'calf');
- Gambiri *veċelā́* (< *vatsala-* 'calf').

The dental affricate is found also in the 'calf' words of the neighbouring Dardic group of Neo-Indo-Aryan of northernmost Pakistan and Kashmir, and in the Iranian languages of the Pamir mountains that also neighbour Nuristani:

- Kalasha *baċhá,* (Urtsun) *baċhoŕä,* (Rumbur) *bičhoŕə;*
- Dameli *baċhár* m (< *vatsatara-*);
- Bashkalik *baċḗr* (< *vatsatarī-*);
- Phalura *baċhā́r* m (< *vatsatara-*);
- Shina (Gilgit, Kohistan) *baċhṓ* m., *baċōī* f., (Guresi) *baċhóu* m. (Palesi) *baċoṛo*, (Jijelut) *baċóṛɔ*; *baċhar, baċər, basəro* m. (< *vatsatara-*);
- Tirahi *baċa*;
- Pashai (Kurangali & Areti) *vāċək* (< *vatsaka-*), *vāċelik* (< *vatsalaka-*), (Darrai-i Nuri) *váčula* (< *vatsala-*), (Laurowani) *vasāk*;
- Gawarbati *ēċī* (< *vatsikā*);
- Torwali *bās* 'calf';
- Savi *bāċo* 'calf';
- Kashmiri *voċhu*, *vaċhor*^{u} m., *vaċh*^{a}*r, vaċhür*^{ü} f., (Poguli) *voċ*, (Dodi of Siraj) *baċurō* m.;
- Shumashti *vaċolik* (< *vatsalaka-*).

(Turner 1966: 655 nos. 11239; 656 nos. 11241 & 11244.)

The Nuristani languages of northeastern Afghanistan (called Kafiri or 'pagan' languages before Nuristan's conversion into Islam in 1894) have the dental affricate *ċ* in many words that in Proto-Aryan had **ć*, e.g., Kati *duċ* < Proto-Nuristani **daċa*

< Proto-Aryan **daća* > Sanskrit *daśa* 'ten'. As the sound change Proto-Aryan **ć* > **ċ* has been reconstructed for Proto-Iranian, many eminent linguists, including Manfred Mayrhofer (1989: 4, 6), believe(d) that Nuristani *ċ* has in its isolation preserved Proto-Iranian **ċ,* and that Nuristani therefore is, at least partially, an Iranian language. Proto-Aryan aspirated stops losing their aspiration is another Iranian feature in Nuristani. There are, however, other features which suggest that the Nuristani languages preserve an archaic Indo-Aryan language, and this view also has eminent supporters. Most recently, Chlodwig Werba has published an impressive paper entitled "Ur(indo)arisches im Nūristānī: Zur historischen Phonologie des Indoiranischen" (2016). Werba (2016: 344–346) argues that the Nuristani words for 'daughter', e.g., *lüšt* in Prasun, go back to Proto-Aryan = Proto-Indo-Aryan **d*^{h}*ug*^{h}*Htár-,* refuting the reconstructions of Reiner Lipp (2009 I: 167–169; 335, 348–350; II: 362–386, 484–486). Werba (2016: 346–347) also takes the sound change **s* > *h* as one of the defining features of the Iranian branch, and it is lacking in Nuristani. In his opinion, it is also equally possible that Nuristani preserved the Proto-Aryan = Proto-Indo-Aryan **ć*, which was later independently depalatalized into **ċ*. However, many Iranists today believe that **s* > *h* is a post-Proto-Iranian change (Mayrhofer 1989: 7; Schmitt 2000: 14–15; Lipp 2009 I: 318–322); and in view of other Iranianisms in early Indo-Aryan to be discussed below, an independent later depalatalization of preserved Proto-Aryan **ć* in Nuristani appears less credible than the preservation of Proto-Iranian **ċ*.

8. Early Iranianisms in Nuristani and Vedic Indo-Aryan

Proving that this or that important word or important phoneme or other feature in Nuristani was inherited from either Indo-Aryan or Iranian, however, does not prove that Nuristani is exclusively Indo-Aryan or Iranian. Yet this is what many scholars have tried to do, and this seems to be the main reason why the position of Nuristani within Indo-Iranian has remained unsettled. A compromise could settle the problem, and to my mind, a realistic compromise has been proposed by Almuth Degener (2002), herself an eminent scholar of Nuristani: Nuristani could be an early mixture of Indo-Aryan, spoken by the first Aryan settlers of the Indo-Iranian borderlands, and an Iranian language, spoken by a slightly later wave of immigrants, archaisms of both groups surviving in isolation. Behind Degener's consideration were my proposed correlations between linguistics and archaeology with particular reference to Indo-Iranian, correlations that together with the **s* > *h* change had been the topic of a paper by Almut Hintze (1998) shortly before.

The well-known Finnish archaeologist A. M. Tallgren, founder and editor of the journal *Eurasia Septentrionalis Antiqua*, was the first to propose (in 1928) that the Andronovo pastoralist cultures (figs. 5 & 11) which dominated of the Asiatic steppes between the Ural and Altai mountains in the Bronze Age were Aryan-speaking. Among many others, I have shared Tallgren's view, but narrowed the Andronovo language to the Indo-Aryan branch (Parpola 1974 through 2015). The Andronovo cultures have been considered to go back to the Sintashta culture of the southern Urals, where the horse-drawn chariot appears to have been invented around 2100 BCE (Parpola 2005).

A previously unknown, extensive and rich Bronze Age culture called Bactria and Margiana Archaeological Complex (= BMAC) (Fig. 6) was discovered and excavated in 1969–2013 by the Greco-Russian archaeologist Viktor Sarianidi. Its location in southern Turkmenistan, northern Afghanistan, Tajikistan and Uzbekistan placed it on the route of the Indo-Aryans, if they came from the northern steppes to South Asia. Andronovo ceramics are not found south of Turkmenistan, while there is clear evidence of BMAC expansions to the Indus Valley, to the Iranian Plateau and to northern Iran during the 20th century BCE. Roman Ghirshman, a noted expert of Iranian archaeology, proposed in 1977 that the Indo-Aryan speaking ruling elite of Syria's Mitanni kingdom (c. 1500–1300 BCE) came from northern Iran. All this suggests to me that, as later in Syria, early Indo-Aryan speakers coming from the steppes took over the power in the BMAC, adopted the local culture, and continued their expansions southwards in this novel cultural garb. Comparison of Vedic Sanskrit and Mitanni Indo-Aryan, and temporal estimations for the evolution of Vedic literature, have suggested that the Ṛgvedic Indo-Aryans came to the Indus Valley only around 1400–1200 BCE. The BMAC people therefore had to represent an earlier wave of Indo-Aryan immigrants, a wave whose existence was suggested also by the archaic *vrātya* rites, which survive fossilised in the Veda. (Parpola 1988.)

I now think that this 20th century BCE wave of BMAC immigrants brought to South Asia the Indo-Aryan dialect of the Atharvavedic tradition, which cannot be derived from the Ṛgvedic dialect (Parpola 2012b; 2015: 130–144). In 1988, however, I mistakenly linked this early BMAC wave with the Dāsas and Dasyus, enemies whom the Ṛgvedic Indo-Aryans met on their immigration to South Asia. The reason was this. The Ṛgveda speaks of Dāsa fortresses which had multiple concentric walls, broken with the help of the Indo-Aryan war-god Indra. At Dashly-3 in northern Afghanistan, Sarianidi had excavated a BMAC temple-fort with three concentric circular walls, dated to c. 1900 BCE, thus matching the Ṛgvedic descriptions of Dāsa forts. When Mortimer Wheeler exposed the mighty walls of Harappa, he had suggested that the Dāsa forts were the walled cities of the Indus Civilization (Wheeler 1947). Now, however, it appeared that the Ṛgvedic Indo-Aryans met the Dāsas not in the Indus Valley, but in Afghanistan.

That the Dāsas were Aryan speakers has already been shown by Harold Bailey in 1959 in a paper that connected the ethnic name Dāsa with Khotan Saka *daha-* and Vakhi *δay* < **daha-* 'man, human being, manly hero', Ossetic *läg* 'man' (which may go back to Alanian **dahaka-*) being one further possible cognate.[19] The meaning

19. The proposed etymologies for this word of the three Saka languages have failed to convince experts. My own derivation of it from the PIE root **dens-*/**dn̥s-* 'to be(come) clever, skilful or wise' (semantically comparable to *Śaka*/*Saka* from *śak-* 'to be able, skilful, powerful') (Parpola 2012a: 237; 2015: 102) works only if we assume that the Ṛgvedic Indo-Aryans were unaware of this etymology, and simply took over *Dāsa-* as the ethnic name of their enemy with no deeper meaning for them, *Dása-* being then their back-formation for the ancestor of the *Dāsas*. Their etymological ignorance is suggested by the usual Indo-Aryan meaning 'slave' already attested in the Ṛgveda, and undoubtedly derived from the use of war-captives as slaves: the English word *slave* ultimately comes from the ethnic name of Slavonic people (Onions ed. 1966: 834a). In that case, the accentuation of *Dása-* instead of the expected **Dasá-* < **Dn̥s-á-* does not matter. One can also point to fluctuation of the accent in the enemy name in *śimyúm* (sg. acc.)

suits an ethnic self-appellation, while Sanskrit *dāsa-* in the sense of 'slave' (since the Ṛgveda) can be understood as originating from the ethnic name of war-captives. The Ṛgveda (6,21,11) once mentions Dása as the ancestor of the Dāsas, who was succeeded by Manu ('man'), the ancestor of the Ṛgvedic Indo-Aryans. Moreover, the Old Persian, Greek and Latin sources speak of Iranian tribes called respectively *Dahā / Dā́ai, Dā́oi / Dahae* who lived in the Indo-Iranian borderlands around 500–300 BCE. It seems clear that the *Dāsas* of the Ṛgveda were not an earlier wave of Indo-Aryans, but an early wave of Iranian speakers, in whose language the **s* > *h* change had not yet taken place. But how could their presence be explained archaeologically if the BMAC immigrants of the 20th century were Indo-Aryans coming from the early Andronovo culture, and if the Ṛgvedic Indo-Aryans came around 1400–1200 BCE? According to my newer correlations of linguistic and archaeological data, the Iranian branch remained in Europe, mainly in the North Pontic-Caspian steppes, until about 1600 BCE, when the Iranian speakers adopted horse-riding and quickly expanded into the Asiatic steppes which until then had been occupied by the Andronovo cultures of Indo-Aryan speakers. Among these 'Roller Pottery' cultures (Fig. 12) expanding with horse-riding from the Pontic steppes is the Yaz I culture (1500–1000 BCE) (Fig. 12: 12), which replaced the BMAC culture in southern Central Asia. Among the local traditions that the Yaz I culture adopted from the BMAC were forts comparable to the Ṛgvedic descriptions of the Dāsa forts on the one hand and to the present-day fortified manors of Pashto speakers in eastern Afghanistan on the other hand. The horse-drawn chariot is prominent in Andronovo graves and in the Ṛgveda, where the word *ratha-* 'chariot' and its derivatives occur at least 633 times. In contrast, there are only two clear references to horse-riding in the Ṛgveda (Falk 1994). Unlike Iranian, Indo-Aryan also lacks a special verb for riding. Moreover, no graves at all have been found in the area of the Yaz 1 culture from 1500 BCE until historical times, and this very area is a prime candidate for the early homeland of Zoroastrianism that practises exposure burial. (Parpola 2012ab; 2015: 92–106.)

Nuristani seems to represent an isolated pocket of an early mixture of Iranian-speaking Dāsas and pre-Ṛgvedic Indo-Aryans. From tribal names cognate with *Dāsa* locatable in Sindh and Marwar, and from other indications, it appears that the Dāsas did not stop in the Indo-Iranian borderlands, but immigrated also to the Indus Valley

in Ṛgveda 7,18,5c and *símyūn* (pl. acc.) in Ṛgveda 1,100,18a. (As pointed out by Chlodwig Werba in an e-mail on 26 February 2017, my reference to *dasrā́* vs. *dásrā* in this context is simply a blunder on my part, since the shift of the accent to the first syllable is due to the vocative case in *pāda-* or sentence-initial position.) The root *daṁs-* < PIE **dens-* 'to be clever or skilful' does exist in Indo-Aryan (Werba 1997: 193 no. 87) and, if the Ṛgvedic Indo-Aryans could connect the enemy name with it, they would have said **dāṁsá-* (which does not exist) in the vṛddhi grade instead of *dāsá-*. This is a valid point made by Werba in his criticism of my etymology. There seems to be a slight chance that the early Sakas still understood the etymology of their word for 'man' and their ethnic name, namely if Younger Avestan *dā̃ŋha-* = **dāha-* was the starting point of the change *h* > *ŋh* that Hoffmann & Forssman (1996: 106 § 74) explain from the *h* becoming voiced in the sequence **a*(*a*)*ha*(*a*). But it is not necessary to assume that the Saka knew the original etymology either; for me personally, the etymological motivation of some Finnish words has long remained unnoticed, though it afterwards seems obvious. In any case, my proposed PIE etymology does not affect the derivation of Indo-Aryan *dāsa-* from Proto-Saka **dasa-*/*dāsa-*.

and further into South Asia (Parpola 2015: 255–265). They adopted the Indo-Aryan speech, but introduced cultural and linguistic Iranianisms. A case in point is the name *Mātariśvan* that occurs 27 times in the Ṛgveda. Mātariśvan is either identified with the Vedic fire-god Agni or he is said to be the producer of fire by friction. Stanley Insler (in an unpublished paper of 1985 summarized in Parpola 2005: 26–27 and 2015: 114–115) has convincingly derived Mātariśvan from Iranian *ātar* 'fire' + *íśvan-* 'master'. The latter component is equivalent to Avestan *isvan-* and preserves the verbal root **iś-* 'to master' in its original unreduplicated form, in contrast to Indo-Aryan *īś-* (present < perfect **i-iś-,* Werba 1997: 424 no. 541). The Vedic word for fire, *agni-,* is unknown to the Avesta, and the Avestan word for 'fire', *ātar-*, is unknown to the Veda. The Vedic poets did not understand the word *ātar-*, and folk-etymologically associated the god's name with *mātar-* 'mother': in Ṛgveda 1,141,5, Mātariśvan is said to have been "fashioned in his mother", *amimīta mātari*. Occasion for such a misunderstanding was offered by contexts where the name was preceded by a word ending in *-m* (about one third of the Ṛgvedic occurrences): *...m *ātaríśvā*.

In southernmost Nuristan, Indra, the principal divinity of the Ṛgvedic Aryans, is worshipped as the highest god. This Indra worship may have been introduced during the immigration of the Ṛgvedic Indo-Aryans: at least one batch of them was led by King Divodāsa Atithigva from the region around present-day Kandahar[20] via mountainous eastern Afghanistan settled by Dāsas to the Kabul region and then via Swat to the Punjab. But elsewhere in Nuristan, the highest god is *Imra/Yamrai* < **Yama-rāja*, King Yama. (On the worship of Imra/Yamrai and Indr in Nuristan, see now Klimburg 1999 I: 140–155.) Yama is not mentioned at all in the older parts of the Ṛgveda, appearing first

20. In my work (Parpola 1988: 222–224; 2015: 97–101), I have accepted Alfred Hillebrandt's (1891, I: 96ff; 1927, I: 510–514) interpretation of Ṛgveda 6,61,1–3, according to which the Sarasvatī River, on whose banks King Divodāsa was born, is the river in southeastern Afghanistan that gave the name Haraxvaitī- (in Avestan) or Harahuvati- (in Old Persian) or Arachosia (in Greek) to the province of the Persian empire where it flowed. One of Hillebrandt's arguments for this location was connecting the Bṛsayas mentioned as enemies of Divodāsa in Ṛgveda 6,61,3 with the name of the satrap of Arachosia and Drangiana (Seistan) in Alexander's time, Barsaéntēs. In an e-mail on 3 March 2017, Chlodwig Werba has pointed out to me that "there are two clear-cut reasons why the two (personal) names cannot be connected in the intended form of the one being the loan of the other (as Hillebrandt assumed). [1] The classical sources (which I have treated exhaustively in my dissertation *Die arischen Personennamen und ihre Träger bei den Alexanderhistorikern* [Wien 1982], p. 106ff. & 129f.), show an old graphic oscillation between *Barsáe*° and *Barzáe-* (often written with xi instead of zeta), which can only be explained by presupposing an old palatal dental affricate /dz/ for which the speakers of PIA should have substituted their palatal /j/. Even if the Proto-Iranians of the 2nd millennium should already have changed this inherited affricate to a simple voiced fricative /z/ – not a very probable case indeed – it is more than improbable that their IA brothers would have substituted a voiceless /s/ for it in a context (after the vibrant /r/) where both branches of PII because of the RUKI rule could only use the 'sh'-sound. [2] The forms of the Alexander historians unanimously presuppose an OIr *-nt(a)-* stem, which might either be a possessive adjective in *-vant(a)-*, as already assumed by Ch. Bartholomae (AiW 960) primarily because of the YAv. personal name *b.er.ez(a)uua.nt-* (see Mayrhofer's first fascicle of the *Iranisches Personennamenbuch* [Wien 1977], p. 32), or an *-nt(a)*-participle, which is my preference for phonetic reasons. Whatever its exact etymology, such a formation could only have been borrowed as °*nt(a)-* into PIA." – I have noted that Bṛsaya-, with its *b*, *ṛ*, and *-s-* instead of *-ṣ-*, is likely to come from the original non-Aryan language of the BMAC (Parpola 2002: 92–94; 2015: 81–82, 105).

in the latest books I and X as the son of Vivasvat and the king of the dead. As the first mortal or first man, Yama duplicates Manu ('man'), the son of Vivasvat, the first sacrificer and the ancestor of the Ṛgvedic Aryans. Yama as the righteous god of death who, with the noose in his hand, punishes the sinners, also duplicates the god Varuṇa, who in early Indo-Aryan religion has these functions. Yama seems to have been introduced into the 'Atharvavedic' tradition of the pre-Ṛgvedic Indo-Aryans of South Asia by the Iranian Dāsas, for Yima, the son of Vīvaŋhvat, the first sacrificer of *haoma* and the first king of the Aryans (i.e., Iranians), plays an important role in Old Iranian religion. There are also other things suggesting that Yama is one more "Iranianism" in Indo-Aryan and in Nuristan. (Parpola 2015: 143–144.)

This long excursus dealing with Nuristani and the Dāsas was partly motivated by the need to back up one example of Iranianisms in the Veda, namely the exceptional variants in Vedic Sanskrit where the PIE sequence **dzdh* attests an Iranian development: *dehí* < **dazdhí* < **dedzdhí* 'give!' and *dhehí* < **dhazdhí* < **dhedzdhí* 'put!', besides the regular Indo-Aryan form *daddhí*. These exceptional variants have been explained in different ways, the currently favoured explanation being that they result from a dissimilatory change that took place very early in Indo-Aryan (Hoffmann 1975: 400; Mayrhofer 1986:112). Burrow (1973: 91) mentions the alternative that *dehi* and *dhehi* represent "a case of dialectal divergence". I reckon them among the early Iranianisms of Vedic Sanskrit (cf. Younger Avestan *dazdi* 'give!'; Hoffmann & Forssman 1996: 207; Gotō 2013: 96–97).

9. Conclusion

In this paper, I have, among other things, proposed that Finnish *vatsa* 'stomach' and its cognates, though possibly (if Mansi *waś* 'stomach' is disqualified) known from the Finnic branch alone, go back to PFU **vaćća-*, which was borrowed from Proto-Indo-Aryan **vatsá-*. The northern extension of the Abashevo culture and the related Sejma-Turbino network (2200–1900 BCE) were bilingual with PFU and Proto-Indo-Aryan as their languages, with PFU apparently as the majority language on the European side of the Urals. West Uralic (Proto-Volga-Finnic) became the language of the Netted Ware culture (1900–200 BCE) when PFU was introduced as its elite language. The Indo-Aryan affinity of **vatsa-* is clear from its preservation of the consonant cluster **ts*, while **t* has been dropped in its Proto-Iranian counterpart **vasa-*. Borrowing PFU **vaćća-* from PIA **vatsá-* was possible only before the Abashevo culture and the Sejma-Turbino network ceased to operate, so the word should belong to the core vocabulary of West Uralic inherited from PFU.

Attesting to the presence of **ts* in the Proto-Indo-Aryan of the Abashevo culture, PFU **vaćća-* < PIA **vatsá-* is important also for defining the split of the Indo-Iranian. One of the principal divergences between the two branches is the different development of PIE **-tst- / *-dzd(h)-*, which apparently still survived in the post-PIE Yamnaya culture, including its late variants of the Upper Don and Volga forest steppes,

the source of the Abashevo culture, which expanded to the Uralic homeland in search of copper. In the northern extension of the Abashevo culture, PIE **-tst-* developed into PIA **-tt-* under the influence of the Uralic substratum, which had geminated stops including **-tt-*. From the Abashevo culture, Indo-Aryan was inherited into the Sintashta, Petrovka, Alakul′ and Fëdorovo Andronovo, and via the BMAC, into the Mitanni and Vedic cultures.

Proto-Indo-Iranian must have started to split when the Catacomb Grave culture (3000–2000 BCE) was formed within the Yamnaya community under the influence of the North Caucasian culture, the source of its metal. Thus the Iranian branch was already separate from Indo-Aryan (whose speakers used other sources of copper) when Iranian shared with its Greek and Balto-Slavic neighbours the change **-tst-* > **-st-,* which led to the change **ts* > **s* in Iranian. The Proto-Volga-Finnic loanword **kesträ* from Pre-Proto-Iranian **kestro-* must have come from the Early Srubnaya culture which, in its Pozdnyakovo variant, exerted strong influence on the Netted Ware culture from 1800 BCE onwards.

According to PFU **vaćća-* < PIA **vatsá-* < PIE **vetsó-*, the change of **e* / **o* > **a* had already taken place in the Indo-Aryan branch before 1900 BCE, while according to Proto-Volga-Finnic **kesträ* < Pre-Proto-Iranian **kestro-* the changes **ke* > **če* and **e* / **o* > **a* had not yet taken place in Iranian around 1800–1600 BCE. These changes, then, are likely to have taken place first in the Indo-Aryan branch, and to have passed to the Iranian branch in the wide-scale mixing of the two branches that followed from the 16th century BCE onwards, when the Iranian speakers adopted horse-riding and spread to the Asiatic steppes until then occupied by Indo-Aryan speakers.

References

Abaev, V. I. 1958–1989: *Istoriko-etimologicheskij slovar' osetinskogo yazyka* I–IV. Moskva – Leningrad: Nauka.

Ahlqvist, August 1871: *De vestfinska språkens kulturord. Ett linguistiskt bidrag till Finnarnes äldre kulturhistoria.* Helsingfors: Frenckell.

Aikio, Ante 2003: Suomen saamelaisperäisistä paikannimistä. – *Virittäjä* 107: 99–106. <http://www.kotikielenseura.fi/virittaja/hakemistot/jutut/2003_99.pdf>

Aikio, Ante 2004: An essay on substrate studies and the origin of Saami. – Irma Hyvärinen, Petri Kallio & Jarmo Korhonen (eds.), *Etymologie, Entlehnungen und Entwicklungen: Festschrift für Jorma Koivulehto zum 70. Geburtstag.* Mémoires de la Société Néophilologique de Helsinki 68. Helsinki: Uusfilologinen yhdistys. 5–34.

Aikio, Ante 2006: On Germanic-Saami contacts and Saami prehistory. – *Journal de la Société Finno-Ougrienne* 91. Helsinki: Suomalais-Ugrilainen Seura. 9–55.

Aikio, Ante 2007a: The study of Saami substrate toponyms in Finland. – *Onomastica Uralica* 4: 159–197. <http://mnytud.arts.klte.hu/onomural/kotetek/ou4/08aikio.pdf>

Aikio, Ante 2007b: Saamelaisajan paikannimistö Satakunnassa. – Aimo Hakanen & Reijo Kero (toim.), *Sata sanan juurta: Satakunnan vanhaa paikannimistöä.* Satakunta: Kotiseutututkimuksia, 25. Kokemäki: Satakunnan Historiallinen Seura. 14–25.

Aikio, Ante 2009: The Saami loanwords in Finnish and Karelian. Ph.D. dissertation, University of Oulu.

Aikio, Ante 2012a: On Finnic long vowels, Samoyed vowel sequences, and Proto-Uralic *x. – Tiina Hyytiäinen, Lotta Jalava, Janne Saarikivi & Erika Sandman (eds.), *Per Urales ad Orientem: Iter polyphonicum multilingue. Festskrift tillägnad Juha Janhunen på hans sextioårsdag den 12 februari 2012*. Mémoires de la Société Finno-Ougrienne 264. Helsinki: Suomalais-Ugrilainen Seura. 227–250.

Aikio, Ante 2012b: An essay on Saami ethnolinguistic prehistory. – Riho Grünthal & Petri Kallio (eds.), *A linguistic Map of Prehistoric Northern Europe.* Mémoires de la Société Finno-Ougrienne 266. Helsinki: Suomalais-Ugrilainen Seura. 63–117.

Aikio, Ante 2015: The Finnic 'secondary *e*-stems' and Proto-Uralic vocalism. – *Journal de la Société Finno-Ougrienne* 95. Helsinki: Suomalais-Ugrilainen Seura 25–66.

Ambrosiani, Björn 1959: Keramikboplatsen på Hamnbrinken vid Darsgärde. *Tor* 5: 108–128.

Ambrosiani, Björn 1964: *Fornlämningar och bebyggelse: Studier i Attundalands och Södertorns förhistoria*. Uppsala: Almqvist & Wiksell.

Anthony, David W. 2007: *The Horse, the Wheel, and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World*. Princeton: Princeton University Press.

Bader, O. N., D. A. Krajnov & M. F. Kosarev (eds.) 1987: *Epokha bronzy lesnoj polosy SSSR*. Arkheologiya SSSR. Moskva: Nauka.

Bailey, H. W. 1959 (1960): Iranian *Arya-* and *Daha-*. – *Transactions of the Philological Society* 1959: 71–115.

Bailey, H. W. 1979: *Dictionary of Khotan Saka.* Cambridge: Cambridge University Press.

Bartholomae, Christian, 1904: *Altiranisches Wörterbuch*. Strassburg: Karl J. Trübner.

Baudou, Evert, 1960: *Die regionale und chronologische Einteilung der jüngeren Bronzezeit im Nordischen Kreis.* Acta Universitatis Stockholmiensis, Studies in North European Archaeology 1. Stockholm: Almqvist & Wiksell.

Bereczki, Gabor, 1988: Geschichte der wolgafinnischen Sprachen. – Denis Sinor (ed.), *The Uralic languages: Description, history and foreign influences.* Handbuch der Orientalistik, Achte Abteilung I. Leiden: E. J. Brill. 314–350.

Böhtlingk, Otto & Rudolf Roth 1855–1875: *Sanskrit-Wörterbuch* I–VII. St. Petersburg: Kaiserliche Akademie der Wissenschaften.

Buck, Carl Darling 1949: *A dictionary of selected synonyms in the principal Indo-European languages: A contribution to the history of ideas*. Chicago: The University of Chicago Press.

Burmeister, Stefan 2004: Der Wagen im Neolithikum und in der Bronzezeit: Erfindung, Ausbreitung und Funktion der ersten Fahrzeuge. – Mamoun Fansa & Stefan Burmeister (eds.), *Rad und Wagen: Der Ursprung einer Innovation. Wagen im Vorderen Orient und Europa*. Beiheft der Archäologischen Mitteilungen aus Nordwestdeutschland 40. Mainz: Verlag Philipp von Zabern. 13–40.

Burrow, T. 1973: *The Sanskrit language*. New and revised edition. London: Faber and Faber.

Caland, Willem 1931: *Pañcaviṃśa-Brāhmaṇa: The Brāhmaṇa of Twenty Five Chapters translated.* Bibliotheca Indica, Work 255. Calcutta: The Asiatic Society of Bengal.

Carpelan, Christian 1999: Käännekohtia Suomen esihistoriassa aikavälillä 5100 ... 1000 eKr. – Paul Fogelberg (ed.), *Pohjan poluilla: Suomalaisten juuret nykytutkimuksen mukaan*. Bidrag till kännedom av Finlands natur och folk 153. Helsinki: Suomen Tiedeseura. 249–280.

Carpelan, Christian 2000: Essay on archaeology and languages in the western end of the Uralic zone. – *Congressus Nonus Internationalis Fenno-Ugristarum I: Orationes plenariae & Orationes publicae.* Tartu. 7–38.

Carpelan, Christian 2002: Arkeologiset löydöt aikaportaina. – Riho Grünthal (ed.), *Ennen, muinoin: Miten menneisyyttämme tutkitaan.* Tietolipas 180. Helsinki: Suomalaisen Kirjallisuuden Seura. 188–212.

Carpelan, Christian & Asko Parpola 2001: Emergence, contacts and dispersal of Proto-Indo-European, Proto-Uralic and Proto-Aryan in archaeological perspective. – Christian Carpelan, Asko Parpola & Petteri Koskikallio (eds.), *Early contacts between Uralic and Indo-European: Linguistic and archaeological considerations.* Mémoires de la Société Finno-Ougrienne 242. Helsinki: Suomalais-Ugrilainen Seura. 55–150.

Chernykh, E. N. 1992: *Ancient metallurgy in the USSR: The Early Metal Age.* Translated by Sarah Wright. Cambridge: Cambridge University Press.

Chernykh, E. N. 2007: *Kargaly: Fenomen i paradoksy razvitiya. Kargaly v sisteme metallurgicheskikh provincij. Potaennaya (sakral'naya) zhizn' arkhaichnykh gornyakov i metallurgov.* (Kargaly 5.) Moskva: Yazyki slavyanskoj kul′tury.

Chernykh, E. N. 2008: Formirovanie evrazijskogo stepnogo poyaza skotovodcheskikh kul′tur: Vzglyad skvoz′ prizmu arkheometallurgii i radiouglerodnoj khronologii / Formation of the Eurasian steppe belt of stockbreeding cultures: Viewed through the prism of archaeometallurgy and radiocarbon dating. *Opus (Mezhdisciplinarnye issledovaniya v arkheologii)* 6: 12–46.

Chernykh, E. N. 2009: Formation of the Eurasian Steppe Belt cultures, viewed through the lens of archaeometallurgy and radiocarbon dating. – Bryan Hanks & Katheryn Linduff (eds.), *Social Complexity in Prehistoric Eurasia: Monuments, Metals and Mobility.* Cambridge: Cambridge University Press. 115–145.

Chernykh, E. N., O. N. Korochkova & L. B. Orlovskaya 2017: Problemy kalendarnoj khronologii Sejminsko-turbinskogo transkul′turnogo fenomena. *Arkheologiya, Etnografiya i Antropologiya Evrazii* 45 (2): 37–47.

Chernykh, E. N. & S. V. Kuz′minykh 1989: *Drevnyaya metallurgiya severnoj Evrazii (Sejminsko-Turbinskij fenomen).* Moskva: Nauka.

Cheung, Johnny 2006: *Etymological dictionary of the Iranian verb.* Leiden Indo-European Etymological Dictionary Series 2. Leiden: Brill.

Chlenova, N. L. 1984: Arkheologicheskie materialy k voprosu ob irancakh doskifskoj epokhi i indo-irancakh. *Soveckaya Arkheologiya* 1984 (1): 88–103.

Collinder, Björn 1955: *Fenno-Ugric vocabulary: An etymological dictionary of the Uralic languages.* A handbook of the Uralic languages 1. Stockholm: Almqvist & Wiksell.

Degener, Almuth 2002: The Nuristani languages. – Nicholas Sims-Williams (ed.), *Indo-Iranian languages and peoples.* Proceedings of the British Academy 116. Oxford: Published for The British Academy by Oxford University Press. 103–117.

de Vaan, Michiel 2011: Review of Lipp 2009. – *Kratylos* 59: 1–14.

Diefenbach, Lorenz 1846–1851: *Vergleichendes Wörterbuch der gothischen Sprache* I–II. Frankfurt am Main: Sauerländer – Baer.

Eggeling, Julius 1882–1900: *The Śatapatha-Brāhmaṇa according to the text of the Mādhyandina school translated* I–V. Sacred Books of the East, 12, 26, 41, 43, 44. Oxford: Clarendon Press.

Elfenbein, Josef 1989: Balōčī. – Rüdiger Schmitt (ed.), *Compendium linguarum Iranicarum.* Wiesbaden: Dr. Ludwig Reichert Verlag. 350–362.

Eriksson, Thomas 2009: *Kärl och social gestik: Keramik i Mälardalen 1500 BC – 400 AD. AUN 41*. Arkeologiska undersökningar, Skrifter 76. Uppsala: Uppsala universitet – Riksantikvarieämbetet.

Eriksson, Thomas 2012: Pottery, transmission and innovation in Mälardalen. – Nils Anfinset & Melanie Wrigglesworth (eds.), *Local societies in Bronze Age Northern Europe*. Sheffield: Equinox. 185–200.

Falk, Harry 1994: Das Reitpferd im Vedischen Indien. – Bernhard Hänsel & Stefan Zimmer (eds.), *Die Indogermanen und das Pferd*. Archaeolingua 4. Budapest: Archaeolingua Alapítvány. 91–101.

Feldt, Björn 2002: Tarandgravar: En ny gravtyp i tid av förändrade samhällsstrukturer. *Fornvännen* 98: 13–25.

Feldt, Björn 2005: *Synliga och osynliga gränser. Förändringar i gravritualen under yngre bronsåldern-förromersk järnålder i Södermanland*. Stockholm Studies in Archaeology 37. Stockholm: Stockholms universitet.

Fogelberg, Paul (ed.) 1999: *Pohjan poluilla: Suomalaisten juuret nykytutkimuksen mukaan*. Bidrag till kännedom av Finlands natur och folk 153. Helsinki: Suomen Tiedeseura.

Fortson IV, Benjamin W. 2004: *Indo-European language and culture: An introduction*. Oxford: Blackwell Publishing.

Frisk, Hjalmar 1960–1970: *Griechisches etymologisches Wörterbuch* I–II. Heidelberg: Carl Winter.

Ghirshman, Roman 1977: *L'Iran et la migration des Indo-Aryens et des Iraniens*. Leiden: E. J. Brill.

Gotō, Toshifumi 2013: *Old Indo-Aryan morphology and its Indo-Iranian background*. In co-operation with Jared S. Klein and Velizar Sadovski. Österreichische Akademie der Wissenschaften, Philosophisch-historische Klasse, Sitzungsberichte, 849. Band. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Grassmann, Hermann (1875) 1996: *Wörterbuch zum Rig-Veda*. 6., überarbeitete und ergänzte Auflage von Maria Kozianka. Wiesbaden: Harrassowitz Verlag.

Grierson, G. A. 1921: *Linguistic Survey of India* X: *Specimens of languages of the Eranian family*. Calcutta: Government of India.

Grünthal, Riho 2008: Uralic 'wheel'. – András Bereczki, Márta Csepregi & László Klima (eds.), *Ünnepi írások Bereczki Gábor tiszteletére*. Urálisztikai Tanulmányok 19. Budapest: ELTE. 232–243.

Häkkinen, Jaakko 2010: Jatkuvuusperustelut ja saamelaisen kielen leviäminen 1–2. – *Muinaistutkija* 2010 (1) & (2).

Hakulinen, Lauri 1968: *Suomen kielen rakenne ja kehitys*. 3rd ed. Helsinki: Otava.

Hiebert, Fredrik Talmage 1994: *Origins of the Bronze Age oasis civilizations of Central Asia*. Bulletin of the American School of Prehistoric Research 42. Cambridge, MA: Peabody Museum.

Hillebrandt, Alfred 1891: *Vedische Mythologie* I. Breslau: Wilhelm Koebner.

Hillebrandt, Alfred 1927: *Vedische Mythologie* I. Zweite veränderte Auflage. Breslau: M & H. Marcus.

Hintze, Almut 1994: *Der Zamyād-Yašt: Edition, Übersetzung, Kommentar*. Beiträge zur Iranistik 15. Wiesbaden: Dr. Ludwig Reichert Verlag.

Hintze, Almut 1998: The migrations of the Indo-Iranians and the Iranian sound change *s* > *h*. – Wolfgang Meid (ed.), *Sprache und Kultur der Indogermanen*. Innsbrucker Beiträge zur Sprachwissenschaft 93. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck. 139–153.

Hoffmann, Karl 1975: *Aufsätze zur Indoiranistik*, herausgegeben von Johanna Narten, I–II. Wiesbaden: Dr. Ludwig Reichert Verlag.

Hoffmann, Karl & Bernhard Forssman 1996: *Avestische Laut-und Flexionslehre.* Innsbrucker Beiträge zur Sprachwissenschaft 84. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.

Honti, László 1981: A finnugor alapnyelvi affrikáták kvantitásáról. – *Nyelvtudományi Közlemények* 83: 361–370.

Insler, Stanley 1985: Unpublished paper on Mātariśvan read at the IVth East Coast Indo-European Conference at Cornell University, June 1985. [Summarized in Parpola 2005: 26–27; 2015: 114–115.]

Jamison, Stephanie W. & Joel P. Brereton 2014: *The Rigveda: The earliest religious poetry of India translated* I–III. New York: Oxford University Press.

Joki, Aulis J. 1973: *Uralier und Indogermanen: Die älteren Berührungen zwischen den uralischen und indogermanischen Sprachen.* Mémoires de la Société Finno-Ougrienne 151. Helsinki: Suomalais-Ugrilainen Seura.

Kallio, Petri 2006: Suomen kantakielten absoluuttista kronologiaa. – *Virittäjä* 110: 2–25.

Kallio, Petri 2007: Kantasuomen konsonanttihistoriaa. – Jussi Ylikoski & Ante Aikio (eds.), *Sámit, sánit, sátnehámit. Riepmocála Pekka Sammallahtii miessemánu 21. beaivve 2007.* Suomalais-Ugrilaisen Seuran Toimituksia 253. Helsinki: Suomalais-Ugrilainen Seura. 229–249.

Kallio, Petri 2012: The prehistoric Germanic loanword strata in Finnic. – Grünthal & Kallio (eds.) 2012: 225–238. <http://www.sgr.fi/sust/sust266/sust266.html>

Kallio, Petri 2014: The diversification of Proto-Finnic. – Joonas Ahola & Frog (eds.), *Fibula, fabula, fact: The Viking Age in Finland.* Studia Fennica Historica 18. Helsinki: Suomalaisen Kirjallisuuden Seura. 155–168.

Keresztes, László 1987: *Geschichte des mordwinischen Konsonantismus* I. Studia Uralo-Altaica 27. Szeged: Universitas Szegediensis Attila József nominata.

Klimburg, Max 1999: *The Kafirs of the Hindu Kush: Art and Society of the Waigal and Ashkun Kafirs* I–II. Stuttgart: Franz Steiner Verlag.

Kobayashi, Masato 2004: *Historical phonology of Old Indo-Aryan consonants.* Study of languages and cultures of Asia and Africa monograph series 42. Tokyo: Research Institute for Languages and Cultures of Asia and Africa, Tokyo University of Foreign Studies.

Kobayashi, Masato 2012: Review of Lipp 2009. – *Indo-Iranian Journal* 55: 287–296.

Koivulehto, Jorma 1973: *Kenno, kotti* ja *kalvo*: Lisiä germaanis-suomalaisiin lainakosketuksiin. – *Virittäjä* 77: 1–14. [Reprinted, Koivulehto 2016: 16–32.]

Koivulehto, Jorma 1979: Phonotaktik als Wegweiser in der Lehnwortforschung: Die ostfi. *-str*-Wörter. *Finnisch-Ugrische Forschungen* 43: 67–79. [Reprinted, Koivulehto 1999b: 161–168.]

Koivulehto, Jorma 1999a: Varhaiset indoeurooppalaiskontaktit: Aika ja paikka lainasanojen valossa. – Fogelberg (ed.) 1999: 207–236. [Reprinted, Koivulehto 2016: 209–238.]

Koivulehto, Jorma 1999b: *Verba mutuata: Quae vestigia antiquissimi cum Germanis aliisque Indo-Europaeis contactus in linguis Fennicis reliquerint.* Edidit Klaas Ph. Ruppel. Mémoires de la Société Finno-Ougrienne 237. Helsinki: Suomalais-Ugrilainen Seura.

Koivulehto, Jorma 2000: Fest und Zyklus des Jahres: *Jul* und *kekri*. – *Neuphilologische Mitteilungen* 101: 235–252. [Reprinted, Koivulehto 2016: 239–256.]

Koivulehto, Jorma 2001: Zum frühen iranischen und indoiranischen lexikalischen Einfluss auf das Finnisch-Ugrische. – Klaus Karttunen & Petteri Koskikallio (eds.), *Vidyārṇavavandanam: Essays in honour of Asko Parpola*. Studia Orientalia 94. Helsinki: The Finnish Oriental Society. 359–378. [Reprinted, Koivulehto 2016: 257–276.]

Koivulehto, Jorma 2016 = Sampsa Holopainen, Petri Kallio & Janne Saarikivi (eds.), *Verba vagantur: Jorma Koivulehto in memoriam*. Mémoires de la Société Finno-Ougrienne 274. Helsinki: Suomalais-Ugrilainen Seura.

Koryakova, Ludmila N. & Andrej V. Epimakhov 2007: *The Urals and Western Siberia in the Bronze and Iron Ages*. Cambridge: Cambridge University Press.

Kristiansen, Kristian, Morten E. Allentoft, Karin M. Frei, Rune Iversen, Niels N. Johannsen, Guus Kroonen, Łukasz Pospieszny, T. Douglas Price, Simon Rasmussen, Karl-Göran Sjögren, Martin Sikora & Eske Willerslev 2017: Re-theorizing mobility and the formation of culture and language among the Corded Ware Culture in Europe. – *Antiquity* 91 (356): 334–347.

Kümmel, Martin 2017: Etymological problems between Indo-Iranian and Uralic. Paper read at the international colloquium "Contextualizing historical lexicology" at the University of Helsinki on 15–17 May 2017.

Kuz′minykh, S. V. 1996: Osteuropäische und fennoskandische Tüllenbeile des Mälartyps: Ein Rätsel der Archäologie. – *Fennoscandia Archaeologica* 13: 3–27.

Kuz′minykh, S.V., & A. A. Chizhevskij 2017: Vvedenie v arkheologiyu anan′inskoj kul′turno-istoricheskoj oblasti: severo-vostok Evropy v finale bronzovogo i rannem zheleznom vekakh. *Arkheologiya Evrazijskikh Stepej* 3: 22–34.

Lang, Valter 2007: *The Bronze and Early Iron Ages in Estonia*. Estonian Archaeology 3. Tartu: Tartu University Press. <http://www.oapen.org/search?identifier=423939>

Lang, Valter 2015: Formation of Proto-Finnic: An archaeological scenario from the Bronze Age / Early Iron Age. – Harri Mantila, Kaisa Leinonen, Sisko Brunni, Santeri Palviainen & Jari Sivonen (eds.), *Congressus duodecimus internationalis Fenno-Ugristarum: Plenary papers*. Oulu: University of Oulu. 63–84. <http://www.oulu.fi/sites/default/files/content/CIFU12–PlenaryPapers.pdf>

Lang, Valter 2016: Early Finnic-Baltic contacts as evidenced by archeological and linguistic data. – *Journal of Estonian and Finno-Ugric Linguistics* 7 (1): 11–38. <http://jeful.ut.ee/index.php/JEFUL/article/view/jeful.2016.7.01/114>

Lang, Valter & Karl Pajusalu 2017: Väinäjoen itämerensuomi. Esitelmä seminaarissa "Vanha itämerensuomalainen kulttuuri", Tvärminne 2.–3.2.2017.

Lehtinen, Tapani 2007: *Kielen vuosituhannet: Suomen kielen kehitys kantauralista varhaissuomeen*. Tietolipas 215. Helsinki: Suomalaisen Kirjallisuuden Seura.

Lipp, Reiner 2009: *Die indogermanischen und einzelsprachlichen Palatale im Indoiranischen* I–II. Heidelberg: Universitätsverlag Winter.

LIV 1998 = *Lexikon der indogermanischen Verben: Die Wurzeln und ihre Primärstammbildungen*. Unter Leitung von Helmut Rix und der Mitarbeit vieler anderer bearbeitet von Martin Kümmel, Thomas Zehnder, Reiner Lipp, Brigitte Schirmer. Wiesbaden: Dr. Ludwig Reichert Verlag.

Lubotsky, Alexander 2004: Avestan *siiazd-*, Sanskrit *sedh-*, Latin *cēdere* 'to flinch'. – Adam Hyllested, Anders Richardt Jørgensen, Jenny Helena Larsson & Thomas Olander (eds.), *Per aspera ad asteriscos: Studia Indogermanica in honorem Jens Elmegård Rasmussen sexagenarii Idibus Martiis anno MMIV*. Innsbrucker Beiträge zur Sprachwissenschaft 112. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck. 323–332.

Macdonell, A. A. 1924: *A practical Sanskrit dictionary*. Oxford: Clarendon Press.
Mallory, J. P., 1989: *In search of the Indo-Europeans: Language, archaeology and myth*. London: Thames & Hudson.
Marchenko, Z. V., S. V. Svyatko, V. I. Molodin, A. E. Grishin & M. P. Rykun 2017: Radiocarbon chronology of complexes with Seima-Turbino type objects (Bronze Age) in southwestern Siberia. – *Radiocarbon* 2017: 1–17. <DOI:10.1017/RDC2017.24>
Mayrhofer, Manfred 1979: *Die altiranischen Namen*. Iranisches Personennamenbuch 1. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
Mayrhofer, Manfred 1986: Lautlehre (Segmentale Phonologie des Indogermanischen). – Manfred Mayrhofer (ed.), *Indogermanische Grammatik* I. Heidelberg: Carl Winter. 73–216.
Mayrhofer, Manfred 1989: Vorgeschichte der iranischen Sprachen; Uriranisch. – Schmitt (ed.) 1989: 4–24.
Mayrhofer, Manfred 1992–2001: *Etymologisches Wörterbuch des Altindoarischen* I–III. Indogermanische Bibliothek, Reihe 2: Wörterbücher. Heidelberg: Carl Winter.
Meier-Brügger, Michael 2002: *Indogermanische Sprachwissenschaft*. Berlin: Walter de Gruyter.
Morgenstierne, Georg 1974: *Etymological vocabulary of the Shughni group.* Beiträge zur Iranistik 6. Wiesbaden: Dr Ludwig Reichert Verlag.
Morgenstierne, Georg 2003: *A new etymological vocabulary of Pashto.* Compiled and edited by Josef Elfenbein, D. N. MacKenzie & Nicholas Sims-Williams. Wiesbaden: Dr Ludwig Reichert Verlag.
Napol′skikh, V. V. 2014: Problema nachala finno-ugorsko-iranskikh kontaktov. – S. V. Kuz′minykh & A. A. Chizhevskij (eds.), *Anan'inskij mir: Istoki, razvitie, svyazi, istoricheskie sud'by.* Arkheologiya Evrazijskikh stepej, vypusk 20. Kazan′: Otechestvo. 76–89.
Ojala, Karin 2016: *I bronsålderns gränsland: Uppland och frågan om östliga kontakter.* Occasional papers in archaeology 61. Uppsala: Institutionen för arkeologi och antik historia, Uppsala universitet.
Onions, C. T. (ed.) 1966: *The Oxford dictionary of English etymology.* Oxford: Clarendon Press.
Paasonen, Heikki 1917: Alkuper. *str-* ja *tr*-yhtymän edustus länsisuomalaisissa kielissä. – *Virittäjä* 21: 66–67.
Paasonen, Heikki 1990–1999: *H. Paasonens Mordwinisches Wörterbuch,* I–VI. Zusammengestellt von Kaino Heikkilä, bearbeitet und herausgegeben von Martti Kahla. Lexica Societatis Fenno-Ugricae XXIII. Helsinki: Suomalais-Ugrilainen Seura. <http://www.sgr.fi/lexica/lexicaxxiii.html>
Parpola, Asko 1988: The coming of the Aryans to Iran and India and the cultural and ethnic identity of the Dāsas. – *Studia Orientalia* 64: 195–302.
Parpola, Asko 1999: Varhaisten indoeurooppalaiskontaktien ajoitus ja paikannus kielellisen ja arkeologisen aineiston perusteella. – Fogelberg (ed.) 1999: 180–206.
Parpola, Asko 2002: From the dialects of Old Indo-Aryan to Proto-Indo-Aryan and Proto-Iranian. – Nicholas Sims-Williams (ed.), *Indo-Iranian languages and peoples.* Proceedings of the British Academy 116. Oxford: Published for The British Academy by Oxford University Press. 43–102.
Parpola, Asko 2005: The Nāsatyas, the chariot and Proto-Aryan religion. – *Journal of Indological Studies* 16 & 17: 1–63. Kyoto.

Parpola, Asko 2008: Proto-Indo-European speakers of the Late Tripolye culture as the inventors of wheeled vehicles: Linguistic and archaeological considerations of the PIE homeland problem. – Karlene Jones-Bley, Martin E. Huld, Angela Della Volpe & Miriam Robbins Dexter (eds.), *Proceedings of the Nineteenth Annual UCLA Indo-European Conference, November 2–3, 2007.* Journal of Indo-European Studies Monograph 54. Washington, D.C.: Institute for the Study of Man. 1–59.

Parpola, Asko 2012a: Formation of the Indo-European and Uralic (Finno-Ugric) language families in the light of archaeology: Revised and integrated 'total' correlations. – Grünthal & Kallio (eds.) 2012: 119–184. <http://www.sgr.fi/sust/sust266/sust266_parpola.pdf>

Parpola, Asko 2012b: The Dāsas of the Ṛgveda as Proto-Sakas of the Yaz I-related cultures. With a revised model for the protohistory of Indo-Iranian speakers. – Martin E. Huld & Karlene Jones-Bley & Dean Miller (eds.), *Archaeology and language: Indo-European studies presented to James P. Mallory.* Journal of Indo-European Studies Monograph no. 60. Washington, D. C.: Institute for the Study of Man. 221–264.

Parpola, Asko 2015: *The roots of Hinduism: The early Aryans and the Indus Civilization.* New York: Oxford University Press.

Patrushev, Valeri 2000: *The early history of the Finno-Ugrian peoples of European Russia.* Studia Archaeologica Fenno-Ugrica 1. Oulu: Societas historiae Fenno-Ugricae.

Pokorny, Julius 1959: *Indogermanisches etymologisches Wörterbuch* I–II. Basel: Francke Verlag.

Porzig, Walter 1954: *Die Gliederung des indogermanischen Sprachgebiets*. Heidelberg: Carl Winter.

Rahkonen, Pauli 2013: Suomen etymologisesti läpinäkymätöntä vesistönimistöä. – *Virittäjä* 2013 (1): 5–43. <https://journal.fi/virittaja/article/view/7843/6016>

Rapola, Martti 1966: *Suomen kielen äännehistorian luennot.* Suomalaisen Kirjallisuuden Seuran Toimituksia 283. Helsinki: Suomalaisen Kirjallisuuden Seura.

Rassamakin, Yuri 2012: Absolute chronology of Ukrainian Tripolian settlements. – Francesco Menotti & Aleksey G. Korvin-Piotrovskiy (eds.), *The Tripolye culture giant-settlements in Ukraine: Formation, development and decline.* Oxford: Oxbow Books. 19–69.

Rédei, Károly 1988: *Uralisches etymologisches Wörterbuch* I–II. Wiesbaden: Otto Harrassowitz.

Reisborg, Synnöve 1989: Die Keramik der Darsgärde-Siedlung, Skederid, Uppland. Eine Chronologische Analyse. – B. Ambrosiani (ed.), *Die Bronzezeit im Ostseegebiet.* Kungl. Vitterhets-, Historie- och Antikvitets-Akademien, Konferenser 22. Stockholm: Almqvist & Wiksell. 83–105.

Reshetnikov, Kirill & Mikhail Zhivlov 2011: Reflexes of Proto-Uralic **a* in Samoyed, Mansi and Permic. – *Journal of Language Relationship / Voprosy yazykovogo rodstva* 5: 96–109.

Sammallahti, Pekka 1988: Historical phonology of the Uralic languages, with special reference to Samoyed, Ugric, and Permic. – Denis Sinor (ed.), *The Uralic languages: Description, history and foreign influences.* Handbuch der Orientalistik, Achte Abteilung I. Leiden: E. J. Brill. 478–554.

Sammallahti, Pekka 1998: *The Saami languages: An introduction.* Kárášjohka: Davvi Girji.

Sarianidi, Viktor I. (1929–2013): For Sarianidi's life, work and bibliography, see N. A. Dubova & al. (eds.), *Trudy Margianskoj arkheologicheskoj ekspedicii 6, Pamyati Viktora Ivanovicha Sarianidi*. Moskva: Staryj Sad, 2016.

Schmitt, Rüdiger 2000: *Die iranischen Sprachen in Geschichte und Gegenwart.* Wiesbaden: Reichert Verlag.
SKES = *Suomen kielen etymologinen sanakirja* I–VII. Lexica Societatis Fenno-Ugricae XII. Helsinki: Suomalais-Ugrilainen Seura, 1955–1981.
SSA = *Suomen sanojen alkuperä: Etymologinen sanakirja* 1–3. Helsinki: Suomalaisen Kirjallisuuden Seura – Kotimaisten kielten tutkimuskeskus, 1992–2000.
Steblin-Kamenskij, I. M. 1999: *Etimologicheskij slovar' vakhanskogo yazyka.* Sankt-Peterburg: Peterburgskoe Vostokovedenie.
Szemerényi, Oswald 1989: *Einführung in die vergleichende Sprachwissenschaft.* 3., vollständig neu bearbeitete Auflage. Darmstadt: Wissenschaftliche Buchgesellschaft.
Tallgren, A. M. 1928: [Review of articles from 1927 by S. Teploukhov, M. P. Gryaznov, P. Rykov & S. Dubrilin.] *Eurasia Septentrionalis Antiqua* 3: 186–188.
Tichy, Eva 2004: *Indogermanistisches Grundwissen für Studierende sprachwissenschaftlicher Disziplinen.* 2., überarbeitete Auflage. Bremen: Hempen Verlag.
Turner, R. L. 1966: *A comparative dictionary of the Indo-Aryan languages.* London: Oxford University Press.
Turner, R. L. & D. R. Turner 1971: *A comparative dictionary of the Indo-Aryan languages: Phonetic analysis.* London: Oxford University Press.
Vasmer, Max, 1953–1958: *Russisches etymologisches Wörterbuch* I–III. Heidelberg: Carl Winter.
Wackernagel, Jacob 1896: *Altindische Grammatik* I. Göttingen: Vandenhoeck & Ruprecht.
Werba, Chlodwig H. 1982: *Die arischen Personennamen und ihre Träger bei den Alexanderhistorikern: Studien zur iranischen Anthronomastik*. Diss. phil., Universität Wien.
Werba, Chlodwig H. 1997: *Verba Indoarica: Die primären und sekundären Wurzeln der Sanskrit-Sprache.* I: *Radices Primariae*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
Werba, Chlodwig H. 2016: Ur(indo)arisches im Nūristānī: Zur historischen Phonologie des Indoiranischen. – Andrew Miles Byrd, Jessica DeLisi & Mark Wenthe (eds.), *Tavet Tat Satyam: Studies in honor of Jared S. Klein on the occasion of his seventieth birthday.* Ann Arbor: Beech Stave Press. 341–359.
Wheeler, Mortimer 1947: Harappa 1946: The defenses and cemetery R37. – *Ancient India* 3: 58–130 & pl. XV–LX.
Yushkova, Maria A. 2012: Northwestern Russia at the periphery of the north European and Volga-Uralic Bronze Age. – Nils Anfinset & Melanie Wrigglesworth (eds.), *Local societies in Bronze Age Northern Europe*. Sheffield: Equinox. 129–147.
Ylikoski, Jussi, 2018 (in print): The so-called relation forms of nouns in South Saami: A byproduct or remnant of the Uralic comparative in **mpA*?. *Finnisch-Ugrische Forschungen* 64. Helsinki: Suomalais-Ugrilainen Seura.