CONTACTS

PROGRAMME
&
ABSTRACTS

University of Helsinki
Suomenlinna
9th-10th May 2019

CONTACTS
Archaeology, Genetics & Languages

...joining forces to shed light on early contacts (4000 BC – 1000 AD) between Indo-European and Uralic speakers

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CONTACTS - Archaeology, genetics & languages
joining forces to shed light on early contacts (4000 BC – 1000 AD) between Indo-European and Uralic speakers
May 9-10, 2019, Finland
Suomenlinna

Organised by Riho Grünthal, Volker Heyd, Mika Lavento, Johanna Nichols & Janne Saarikivi
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CONTACTS - Archaeology, genetics, languages joining forces to shed light on early contacts (4000 BC – 1000 AD) between Indo-European and Uralic speakers
Suomenlinna, May 9-10, 2019 - Programme

Thursday 9 May

9.00 – 9.15 Kauppatori (Salutorget) – Suomenlinna (Sveaborg)

9.30 – 9.45 Opening by Riho Grünthal & Volker Heyd

9.45 – 10.30 Janne Saarikivi
The spread of Uralic

10.30 – 11.15 Henny Piezonka, Anastasia Khramtsova, Elena Kostyleva & Ben Krause-Kyora
Volosovo cemeteries and mass graves at Sakhtysh, Central Russia. Indicators of violence or epidemics in the 4th millennium cal BC among the last hunter-fishers?

11.15 – 12.00 Martin Sikora
The deep genomic history of Northern Siberia

12.00 – 13.00 Lunch

13.00 – 13.45 Martin Kümmel
Early Indo-Iranic loans in Uralic: Sounds and strata

13.45 – 14.30 Kerkko Nordqvist & Volker Heyd
Corded Ware interactions of the third millennium BC

14.30 – 15.15 Kristiina Tambets

Archaeogenetics of Finno-Ugric speaking people

15.15 – 15.45 Coffee break

15.45 – 16.30 Ante Aikio
How Lapland became Saami: reconstructing the interaction of Proto-Saami, Proto-Norse and Palaeo-European language communities in the Iron Age

16.30 – 17.15 Mika Lavento
Archaeological contacts in the northern coniferal zone in the second millennium BC

17.15 – 18.00 Panel discussion 1. David Anthony, Juha Janhunen & Johanna Nichols
Mechanisms of linguistic, archaeological and biological spread

19.00 Dinner (Ravintola Sunn)

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9.00 – 9.15 Kauppatori (Salutorget) – Suomenlinna (Sveaborg)

9.45 – 10.30 Petri Kallio
Dating the Dispersal of the Uralic Languages

10.30 – 11.15 Valter Lang
Finnic arrivals to the East Baltic and Finland in the first millennium BC as revealed by archaeological and archaeogenetic data

11.15 – 12.00 Wolfgang Haak
Into the great wide open: genome-wide data from prehistoric

individuals of the Eurasian steppe and neighboring regions

12.00 – 13.00 Lunch

13.00 – 13.45 Guus Kroonen
The earliest Germanic contacts with the Uralic languages: dating the arrival of Germanic and Finnic speakers in Fenno-Scandia

13.45 – 14.30 Anna Wessman
Contacts to the East and West during Late Iron Age (AD 550–1150)

14.30 –15.15 Oleg Balanovski
Evolution of the Y-chromosomal pool in East Europe

15.15 – 15.45 Coffee break

15.45 – 16.30 Päivi Onkamo
aDNA perspectives on population contacts in the Uralic speaking regions

16.30 – 17.30 Panel discussion 2. David Anthony, Riho Grünthal, Volker Heyd & Asko Parpola
Connecting people in east and west

17.30 – Closing

18.30 – Dinner (Bryggeri, Sofiankatu)

ABSTRACTS

How Lapland became Saami: reconstructing the interaction of Proto-Saami, Proto-Norse and Palaeo-European language communities in the Iron Age

Ante Aikio (Sámi Allaskuvla, Guovdageaidnu, Norway)

It has for long been known that the Saami languages possess a large number of old loanwords from Proto-Norse, the ancestral form of the Nordic languages. On the other hand, Saami lexicon also contains a remarkable number of word-roots of unknown origin, more than one third of the reconstructed Proto-Saami lexicon. The phonological and semantic features of this etymologically opaque vocabulary suggest that it largely consists of loanwords adopted from unknown and now extinct 'Palaeo-European' languages spoken in Lapland prior to Saami, a conclusion further corroborated by place-name evidence.

The paper will discuss the dating of the language contacts between the three linguistic groups, and attempt to reconstruct the main outlines of the sociolinguistic setting of these contacts. The results indicate that the middle Iron Age, approximately from the beginning of Common Era to 700 AD, has been a period of radical sociolinguistic change. During this period the Proto-Saami language spread from southern Finland and Karelia to Lapland, and pushed the former Palaeo-European languages of the region to extinction. In the Scandinavian part of Lapland the newly emerged Saami speech communities formed tight-knit bonds with Proto-Norse speaking communities, suggesting the establishment of a trade network.

Interestingly, this period of dramatic sociolinguistic change is not matched in the archaeological record by a corresponding influx of new types of finds. On the contrary, in much of Lapland this period is characterized by sparse finds and lack of ceramics and iron production, and its status as the key period

in the ethnolinguistic history of the Saami has thus remained overlooked by archaeologists. The surprising correlation that emerges between the results of comparative linguistics and archaeology paints a picture of the ethnolinguistic history of Lapland that differs substantially from conventional theories.

Evolution of the Y-chromosomal pool in East Europe

Oleg Balanovsky (Vavilov Institute for General Genetics, Moscow, Russia)

Y-chromosome – the last and the least one in the human genome – is a story-teller informing on the demographic history mirrored in the paternal genetic lineages. The modern Y-chromosomal pool of East European and Ural region populations consists of a few major haplogroups, including R1a, N, and R1b. However, ancient DNA data shows that a few millennia ago the genetic composition of the region was totally different.

Both main branches or R1b (R1b-L51 and R1b-GG400) started to expand ~4 ky BC. Interestingly, both branches marked the massive Yamnaya-related Bronze Age migrations: R1b-GG400 was found in most Yamnaya individuals but is still found in East Europeans steppe rather than in Central/West Europe; in contrast, R1b-L51 was infrequent in Yamnaya individuals studied to date but its expansion across Central/West Europe is clearly associated with the spread of Yamnaya-like genetic component.

Haplogroup N was nearby absent in Europe at Neolithic and Bronze Age but later it arrived from the Ural region and became a predominant genetic component of the north-east Europeans. Equalizing the genetic lineage and the population

is a symptomatic error of the folk-history, so I am far from claiming that all populations carrying haplogroup N were initially Uralic speakers. For example, one specific branch found among Russian princes Rurikovichs marks late Scandinavian migration to the East Slavic populations and thus has nothing to do with Finno-Ugrians. However, it seems that initial spread of the haplogroup N across Europe resulted from the same population movement which brought the Uralic languages there. Dissecting haplogroup N into branches with the narrow geographic areas, and using ancient DNA to trace where and when these branches were found allows reconstruct the migrations across the East Europe. Moreover, it allows reveal the gene pools of the Finno-Ugric populations which were totally assimilated by Russians during the Middle Ages. Focused sampling and deep phylogenetic genotyping of endangered populations like Vod, Izhora, Tver Karels, and many others illuminates the latest Finno-Ugric migrations and helps reconstruct the previous and even initial ones.

Into the great wide open: genome-wide data from prehistoric individuals of the Eurasian steppe and neighboring regions

Wolfgang Haak (Max Planck Institute for the Science of Human History)

Advances in ancient DNA methodology and sequencing technologies have led to a huge supply of ancient human genome(-wide) data, which shed a direct light on population genetic events that have shaped the genetic diversity of today's population.

Numerous recent studies have elucidated the importance of the steppe zones in the history of Eurasia, in particular since

the early Bronze Age and subsequent time periods, which saw an increase in mobility and connectivity, and consequently also an increase in cultural and genetic complexity. Since these time periods also comprise the proposed origin and spread of major language families relevant to West Eurasia, such as Uralic and Indo-European, lead to attempts to reconcile various lines of evidence from linguistics, archaeology and genetics.

In this talk I will review the available ancient human datasets relevant to questions pertaining the contact zones of putative Uralic and Indo-European speaking groups in prehistory, including newly available data from the Caucasus region south of the steppe and eastern hunter-gatherers to the North.

Dating the Dispersal of the Uralic Languages

Petri Kallio (University of Helsinki, Finland)

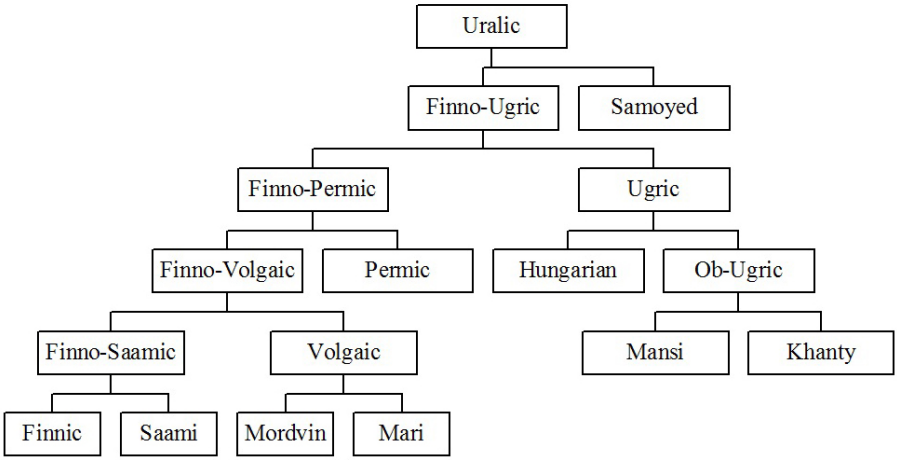

Figure 1: The traditional Uralic family tree

The nine Uralic proto-dialects, namely Finnic, Saami, Mordvin, Mari, Permic, Hungarian, Mansi, Khanty, and Samoyed, have traditionally been classified as above. The linguistic branching itself has generally been thought to have taken several millennia. For instance, Proto-Uralic has been dated about 4000–3000 BC, Proto-Finno-Ugric about 3000–1900 BC, Proto-Finno-Permic about 2000–1000 BC, Proto-Finno-Volgaic about 1730–200 BC, Proto-Finno-Saamic about 1300–1 BC, and Proto-Finnic about 1–1000 AD. Yet all these stages from Proto-Uralic to Proto-Finno-Saamic have unanimously been reconstructed as almost identical with one another. The present paper will offer a solution to this problem.

The earliest Germanic contacts with the Uralic languages: dating the arrival of Germanic and Finnic speakers in Fenno-Scandia

Guus Kroonen (University of København, Denmark & University of Leiden, Netherlands)

One successful way of locating prehistoric language communities is by means of detecting the lexical exchange with each other. Given the fact that Proto-Germanic received terms related to iron smelting from Celtic is a clear indication that speakers of both communities were in contact in the Pre-Roman Iron Age. The multiple layers of borrowings from Proto- as well as Pre-Proto-Germanic in Finnish, Estonian and Saami are evidence of a prolonged period of contact in Scandinavia from the Bronze Age. In this paper, I will re-evaluate the linguistic evidence in order to identify the earliest contacts of the predecessors of Germanic, Finnic and Saami in this region, taking into account the latest results from the study of ancient

DNA. In addition, I will attempt to explore how these contacts tie in with some of the cultural developments of the relevant archaeologically identifiable prehistoric groups.

Early Indo-Iranic loans in Uralic: Sounds and strata

Martin Kümmel (Friedrich-Schiller-Universität Jena, Germany)

Borrowings from Indo-Iranic into Uralic have been in the focus of research for more than one hundred years, but the most recent comprehensive treatment (Katz 2003) is problematic in many respects (see Aikio & Kallio 2005). So, in spite of the importance of these contacts for the prehistory of both language families, much more work is still called for to reach some more clarity. There have been new discussions of the internal relations and the historical phonology of Uralic recently, and such work has led to new insights, especially concerning vocalism (e.g., Kallio 2012; Aikio 2012; 2015; Zhivlov 2014) which might have important consequences for the interpretation of loan relations. Another example are recent proposals to reconstruct Proto-Uralic (and even Proto-Samoyedic) *ć instead of traditional *ś (Lipp 2009: I 280 fn. 44; Zhivlov 2014: 114 fn. 3; 2018). On the Indo-Iranic side, our picture of Indo-Iranic has also changed, sometimes in a parallel fashion: E.g., the reflexes of “primary palatals” are now reconstructed as affricates for Proto-Indo-Iranic and even Proto-Iranic (see Mayrhofer 1989: 6; Koivulehto 2001: 252–257; 2007; Lipp 2009; Lubotsky 2018: 1880f.), so that the reconstruction of Uralic affricates is supported, e.g. PIIr. *ćatá- (or older *ćə̃tá-) ≥ PFU *ćeṯa ‘hundred’. Furthermore, evidence has come into light that at least one “laryngeal” survived as a segment even into Proto-Iranic (Kümmel 2016: ; 2018), e.g., in

a word like *hŕ̥tša- (or *xŕ̥tša-) ‘bear’ > Middle Persian xirs vs. Avestan arša-, Sanskrit ŕ̥kṣa-. This makes it possible to assign loanwords with consonantal reflexes of “laryngeals” (cf. Koivulehto 1991) to an Indo-Iranic stratum instead of an earlier IE stratum. As a result, the existence of PIE loans becomes more problematic. This in turn increases the difficulties to explain the apparently archaic, pre-Proto-Indo-Iranic vocalism in borrowings with Uralic mid vowels in words like *mekši ‘bee’, *kekrä ‘circular thing’ or *ora ‘awl’, *wojna- ‘to see’ and even in a rather late case like *poča(-w) ‘deer’ (Koivulehto 2007). In some of cases a new reconstruction of Uralic vocalism might help: E.g., if there was a (pre-)Proto-Uralic vowel chain shift *u > *ü; *o > u; *a > o (proposed by Pystynen 2017), Uralic *o could easily reflect IIr. *ā̆ that does not go back to PIE *ō̆ (cf. Pystynen 2015). However, it remains questionable if such a solution would be applicable to front vowels, so the question remains what Uralic loanwords with *ä and especially *e mean for the development of Indo-Iranic vocalism, and what this means for strata and dating of these borrowings. All these considerations will also be relevant for the question of a specific Indo-Aryan source for Uralic loans, as claimed by Parpola (2012; 2017).

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Finnic arrivals to the East Baltic and Finland in the first millennium BC as revealed by archaeological and archaeogenetic data

Valter Lang (University of Tartu, Estonia)

Archaeological evidence of comings from the east	Date cal BC	aDNA Y-hgr	Est	Lat	Lit	Fin	central-eastern Sweden
Sejma-Turbino	2000-1600	?	+	-	+	+	-
Early (Baltic) Textile Ware (e.g. Akali, Kullamägi, Narva, Abora, Lagaža)	?2000-1500?	?	+	+	+	+	-
Textile (NE-Tapiola) pottery (Russian, Finnish)	1900/1700-1000?	?	-	-	-	+	-
Bone pins & spiral temple ornaments of bronze as grave goods. "Bone-Pin People" in Estonian stone-cist graves & Kivutkalns in Latvia	1200-700	R1a (R1b)	+	+	-	-	-
Fortified settlements (SW-Tapiola pottery, bone and antler artefacts, incl. bone pins, Akozino-Mālar axes) "Fortified People"	900-500	?	+	+	+/-	+	+
Early *tarand* graves & Ilmandu/Morby pottery	700/500-1	N3a & R1a	+	+	-	+	+
(late) pre-Roman imported goods	400/300-1	?	+	+	+/-	-	-

Archaeological contacts in the northern coniferous zone in the second millennium BC

Mika Lavento (University of Helsinki, Finland)

The transition from the III millennium to the II millennium B.C. meant in the coniferous zone the considerable change of the culture. The most visible new issue was the Seima-Turbino phenomenon. The material that implied bronze objects spread in the large area in the north-eastern part of western Russia, Baltic countries and in Finland and other Scandinavian countries. In Siberia, this Seima axes spread in least to River Baikal, but some other metal implements have been found even in the coastal zone of the Pacific Ocean.

The second essential wave was the appearance and spread of the Textile ceramics in the area from the turn of the River Volga to Baltic countries and the eastern parts of Scandinavia. The use of Textile ceramics began both in the east and west already during the III millennium BC although the spreading of the type in the large area has been dated to the early phase of the II millennium BC. The influence of the ceramic type has stayed long – at least at the PreRoman Iron Age.

In this presentation will be discussed the large-scale contacts and their change particularly during the II millennium B.C. Contacts have taken place during the whole Stone Age. A new phenomenon was their activity and the way, in what way and how rapidly they acted together with bronze implements. As the result of visitors, the local cultures of many places changed and new local cultures began to form.

All these changes gave room for the first influence of the Fenno-Ugrian contacts. Their earliest datings have come so far from the Seima-Turbino phenomenon and in particularly the spread of Textile ceramics in the north.

Corded Ware interactions of the 3rd millennium BC

Kerkko Nordqvist (University of Helsinki, Finland) &
Volker Heyd (University of Helsinki, Finland

The emergence of the Corded Ware complex in the early 3rd millennium BC deeply altered the archaeological map of eastern and central Europe. In the territory (later [and perhaps earlier?]) inhabited by Finno-Ugrian speakers, the situation is partially different, as much of the area was not directly affected by the new cultures. The Corded Ware / Battle Axe cultural groups occupied only the western and southern parts of the Uralic area, from the eastern Baltic Sea coast to the Upper and Middle Volga basin. To the north, the forest zone remained to be inhabited by the numerous hunter-fisher-gatherer groups resuming the old Comb Ware and Volosovo-related traditions. Interaction between these groups is still largely an enigma: It is not always clear what was the role of indigenous groups in the development of Corded Ware cultural groups (if any) and what were the relationships between the newcomers and the locals. Be this as it may, some signs of hybridization are discernible in archaeological assemblages discovered especially in the border zones of Corded Ware and in the areas to the north, and in some cases, in the Corded Ware materials themselves. Due to scarce and inconclusive archaeological evidence, and the lack of proper chronological framework, the interpretations remain tentative so far. The present talk aims to give an overview of the current understanding of the topic.

aDNA perspectives on population contacts in the Uralic speaking regions

Päivi Onkamo (University of Helsinki, Finland)

Uralic speakers are an outlier in the linguistic landscape of Europe, characterized by their peripheric geographical state. For long, there has been debate whether languages and cultures arrive by migration, or whether the process more commonly is an adoption of language or cultural practices, by e.g. elite dominance, with little or almost no admixture. Ancient DNA provides means to evaluate whether a biological population has changed, especially if a time series of burials is available. In case of admixture, population genetic methods enable estimation of the proportions of separate origins as well as any sex-related biases.

The Uralic language family has been shown to arrive in the north-westernmost areas of the speaker population quite late, towards the end of Bronze Age (like Saami language to Finland) or early Iron Age (Baltic Finnic to Estonia and Finland). At some regions, Finno-Ugric languages were, in turn, replaced by IE languages, such as in Latvia (from Livonian to Latvian during the Middle Ages), and Meryan to Russian in 8-14th century central Russia.

We will present preliminary aDNA results of certain time series of burials from Iron-Age Finland and Russia, highlighting contacts between populations. These analyses combined with isotopic information on diets and individual mobility, and the archeological information concerning the burial types, grave goods, and overall cultural affiliation, elucidate the fine details of the process, and hence also add to the understanding of linguistic turning points – even though the bones, themselves, do not speak.

Volosovo cemeteries and mass graves at Sakhtysh, Central Russia. Indicators of violence or epidemics in the 4th millennium cal BC among the last hunter-fishers?

Henny Piezonka (Kiel University, Germany), **Anastasia Khramtsova** (Kiel University, Germany), **Elena Kostyleva** (Ivanovo State University, Russia) & **Ben Krause-Kyora** (Kiel University, Germany)

Contacts between groups might be reflected in the archaeological record, for example, by indications of technological transfer, imports, changes in site types and features, and shifts in rituals or daily practices. However, the actual character of the contacts and to what extent they involved e.g. cross-community kinship relations, changes in ethnic self-perception and linguistic developments is harder to deduce. In this respect, the first half of the 3rd mill. BC in the East-European forest zone is of great interest, since it is characterized by dramatic changes mirrored in material culture, burial customs, and also long-distance contacts of local inhabitants. This transformation was partially connected to the interactions between Volosovo culture hunter-fisher-gatherers in the forest zone and nomadic pastoralists from the steppes represented by Fatyanovo and Balanovo cultural types. Presumably, the contacts had diverse character: cultural influences can be seen in borrowed elements of ceramic decoration, modification of certain stone tool types, the increase of copper artefacts, and in the beginning of pastoralism. However, the spread of knowledge was possibly accompanied by violent actions, as reflected by the emergence of mass graves in the Upper Volga region with individuals who died violent deaths. Another possible interpretation of the graves involves epidemics triggered by the spread of infection. In this paper we present and discuss new archaeological,

palaeopathological and biomolecular analyses on material from the Sakhtysh cemeteries and mass graves in the Upper Volga region, investigating the nature of contacts between the respective forager and pastoralist societies more precisely. We will also discuss the potential of mass graves as a source for interdisciplinary reconstructions.

The spread of Uralic

Jaane Saarikivi (University of Helsinki, Finland)

In my paper I explore the past of the nine Uralic groups and Proto-Uralic from the point of view of external history. i.e. the speaking areas and cultural characteristics of the early communities that spoke Uralic. The Uralic language family consists of the Finnic, Saami, Mordvinic, Mari, Permic and Samoyed branches that go back to Iron Age protolanguages. In addition there is the Ugric group (consisting of three components, Khanty, Mansi and Hungarian) that does not (likely) go back to a common protolanguage but represents a number of distinct features in both the lexicon as well as the grammar.

The approach presented in my paper is based on descendant reconstruction of language areas of the language forms investigated. In this connection, I investigate both the largest historical spread as well as its core area. The core areas are identified by investigating the dialectal variation, past contacts (especially loanword layers that are easiest to reconstruct), toponymic substrates and the palaeolinguistic characteristics of the language community under investigation. A somewhat similar method was followed by J.P. Mallory (1988) in the case of the Indo-European language family, with a further

attempt to find archaeological counterparts for the early IE groups.

It follows from the investigation carried out that all of the protolanguages of the Uralic family were situated in the taiga zone in the metal age. They spread from western Siberia to the Baltic Sea in a chain-like form. Where the Uralic languages have spread to the Arctic they regularly reflect substrates from unidentified sources. Each of the intermediate protolanguages seems to have been spoken in a relatively small core area, and this suggests that there must have been many Uralic language forms in between those preserved that have disappeared.

In the end of the paper, an attempt is made to locate Proto-Uralic on the basis of evidence from the intermediate protolanguages. I suggest a model where the old Ugric area in Western Siberia represents the oldest Uralic area. This assumption is based on the fact that these languages represent old mutual contacts but do not share an Iron Age protolanguage.

The deep genomic history of Northern Siberia

Martin Sikora (University of København, Denmark)

Northern Siberia has been inhabited by humans for more than 40,000 years, yet its deep population history remains poorly understood. I will discuss results from our recent work investigating the region's late Pleistocene population history through analyses of 34 new ancient genomes from 31,000 to 600 years ago. We document complex population dynamics during this period, including at least three major migration events: an initial peopling by a previously unknown Palaeolithic population of "Ancient North Siberians", distantly related to

early West Eurasian hunter-gatherers; the arrival of East Asian peoples giving rise to Native Americans and “Ancient Paleosiberians”, closely related to contemporary communities from far northeastern Siberia such as Koryaks; and a Holocene migration of East Asian peoples, named “Neosiberians”, from which many contemporary Siberians descend. Each of these population expansions nearly replaced earlier inhabitants, ultimately generating the mosaic genetic make-up observed in contemporary peoples across the region. I will discuss the implications of our findings on the genetic origins of Uralic-speaking populations.

Archaeogenetics of Finno-Ugric speaking people

Kristiina Tambets (Institute of Genomics, University of Tartu, Tartu, Estonia)

Uralic-speaking people who live today in Europe and West Siberia resemble genetically the most their closest geographic neighbours. However, almost half of the Y chromosomes[1] and 5-30% of the whole genome variation [2] of westernmost Uralic-speakers (the Finno-Ugrians) link them with the populations living in east – in the Volga Ural region and in West Siberia. Our study considers linguistic, archaeological and genetic data to inform on the events that might be behind this phenomenon.

We have generated genomic data of the individuals from Estonian Late Bronze Age stone-cist graves (1200–400 BC) and Pre-Roman Iron Age tarand cemeteries (800/500 BC–50 AD). The data reveal that a component of possibly Siberian ancestry was added to the gene pool of the Eastern Baltic during the Bronze to Iron Age transition, but probably later than 3,500 ya when it reached Fennoscandia[3]. Notably, this

transition period also coincides with the hypothesized arrival of westernmost Uralic/Finnic languages in the Eastern Baltic, supporting the idea that the spread of these languages was mediated by Iron Age migrants from the east. Considering the archaeological context of the individuals, the gene flow from east seems to have followed the so-called southwestern route from the Volga-Ural region[4]. Furthermore, our study shows that the phenotypic traits often associated with modern Northern Europeans like light eyes, hair and skin as well as lactose tolerance can be traced back to the Bronze Age in the Eastern Baltic.

1. Ilumäe et al. (2016) AJHG 99
2. Tambets et al. (2018) Genome Biol 19: 139
3. Lamnidis et al. (2018) Nat Comm 9: 5018
4. Lang (2018) Läänemeresoome tulemised. TÜ Press

Contacts to the East and West during Late Iron Age (AD 550-1150)

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This paper discusses the Late Iron Age in Finland and this region's connections with the outer world, especially with Eastern Scandinavia and the East. Focus is on the relation between the Mälaren valley in Sweden and Western Finland. Finland was not an isolated part of Northern Europe, but a region with networks reaching the upper Volga area as well as Eastern Scandinavia already in the Merovingian period. These networks were probably quite strong as is indicated by the vast amount of new objects found through metal detecting. It is even likely that Svear in the Mälaren valley, before embarking

on their eastern journeys, gained knowledge about the trade routes in Russia through the Finns and their eastern contacts.

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