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Discussion: Are the Origins of Indo-European Languages Explained by the Migration of the Yamnaya Culture to the West?

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Two co-authored articles in Nature *(Haak et al., 2015; Allentoft et al., 2015) caused a sensation. They revealed genetically the mass migration of steppe Yamnaya culture people in the Early Bronze Age to central and northern Europe. The authors considered this event as the basis of the spread of Indo-European languages. In response, the Russian archaeologist, Leo S. Klejn, expresses critical remarks on the genetic inference, and in particular its implications for the problem of the origins of Indo-European languages. These remarks were shown to the authors and they present their objections. Klejn, however, has come to the conclusion that the authors' objections do not assuage his doubts. He analyses these objections in a further response.*

Keywords: Indo-European languages, migration, Yamnaya culture, Bronze Age

Do the Indo-European Languages of Europe Stem from the Steppe People of the Yamnaya culture?[1]

L.S. Klejn

Attainments and doubt

Two studies published in *Nature* (Haak et al., 2015; Allentoft et al., 2015) analysed ancient DNA from archaeological sites and inferred that massive migration at the transition of the Neolithic to the Bronze Age brought Indo-European languages from the eastern European steppes to the rest of Europe. The steppe Yamnaya (Pit-Grave) culture appeared to be associated with the Proto-Indo-European language, while the origin of the derivative language groups (Greek, Germanic, Slavic, Celtic, among others) was ascribed to the Corded

[1]Originally my text was much longer, but to make it publishable, it was substantially abridged. I have not wanted to restore the original text since it was presented to my opponents in the abridged form and their objections were made in response to this abridged version. Yet I have seen fit to reinstate some minor portions of the original text and some references that do not change my argument, which may facilitate the reading. On the recommendation of a peer reviewer, I also added a new section on the characteristics of the Yamnaya and Corded Ware cultures.

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Ware cultures. This inference coincides with the steppe hypothesis of the origins of the Indo-Europeans. There are, however, several rival hypotheses on this subject.

The authors of these articles are aware of possible criticisms and often qualify their inferences, e.g. perhaps not all Indo-European peoples stem from the Yamnaya but only some of them. But if it is only some of them, then it is not the cradle of Proto-Indo-European, only one of its sub-families. If this were the case, the steppe hypothesis of the origin of Indo-Europeans is transformed into the steppe origin of, say, Indo-Iranians. That scenario is quite realistic, but it would be strange to suppose their spread over northern Europe; furthermore, Indo-Iranian has nothing to do with most European languages!

In common with many other archaeologists, I doubt that the discoveries in question reflect a direct migration from the Yamnaya to the Corded Ware cultures. Let me explain some of their differences.

I have excavated on several occasions steppe barrows containing burials of the Yamnaya culture. I know these burials well: they are usually primary in the barrow, sometimes secondary, with strong skeletons laid on their backs with raised knees, and they are densely covered with red ochre. Men and women are buried in the same way. The graves usually contain handmade ceramics without handles, i.e. small, round-bottomed, egg-shaped vessels, sometimes with a corded decoration. They also often contain hammer-headed pins made of horn, and occasionally stone shaft-hole hammer-axes, and bronze lance-shaped knives and awls. This culture is widely distributed on the steppe. On the western steppe, the Yamnaya is of mixed character, retaining its own distinctive way of interment in barrows but adopting different, local ceramics.

I was also much involved in studying the Corded Ware and Battle-Axe cultures since I derived from them the Donets Catacomb culture (more recent than Yamnaya). These are cultures of a quite different kind. Some Corded Ware cultures have barrows, some not. Men are laid to rest in positions that differ from those of women. The pottery is completely different—the main types are amphorae and beakers—and the most popular weapon is the stone battle hammer-axe. These cultures are widely distributed in the forest and meadow zone, but do not extend onto the steppe.

I doubt that the Yamnaya people spoke the Proto-Indo-European language. In what follows, I discuss the problem with reference to the latest archaeological data and suggest how we can try to resolve the controversy using both genetic and archaeological findings.

Breakup of the Indo-European proto-language

On the basis of glottochronology and cladistics, all the acknowledged dates for the breakup of the Proto-Indo-European languages are located within the seventh to fifth millennia BC (Figure 1): the median date according to Gray and Atkinson (2003) is 6700 BC; for Bouckaert and colleagues (2012/2013) it is 5500 BC; for Swadesh (1955) it takes place before 5000 BC; for Dybo and Kassian (Kushniarevich et al., 2015) it is 5000 BC; for Starostin (2007) it lies around 4670 BC; and for Chang and colleagues (2015) it is 4500 BC. (Even if we expand the range by adding the confidence intervals, this cannot rejuvenate dates significantly. The millennial gap remains.)

Disappearance of the Yamnaya culture

The Yamnaya culture is now well dated by calibrated radiocarbon chronology (Chernykh

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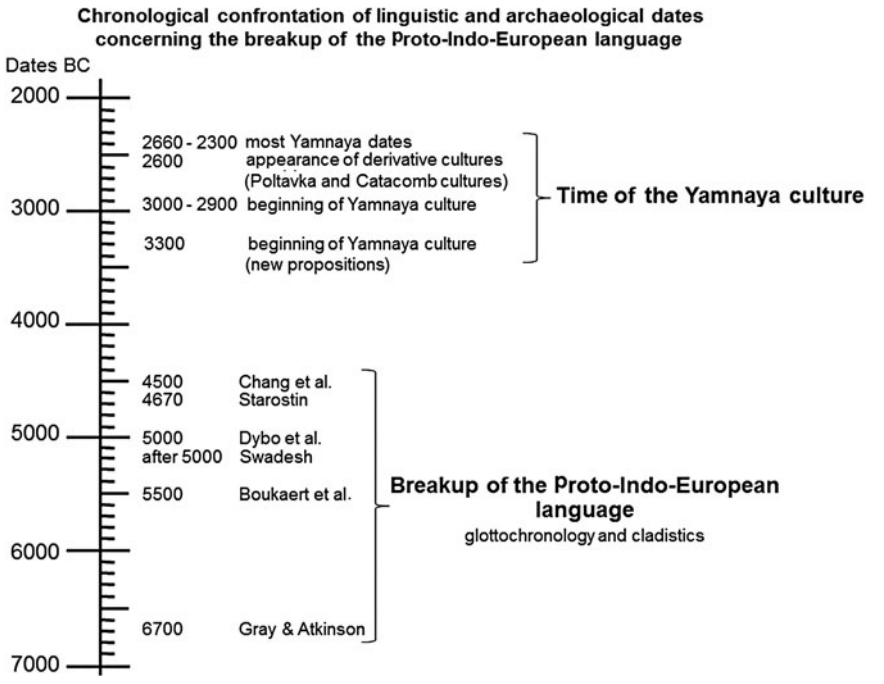

Figure 1. *The breakup of the Proto-Indo-European language (in various datings) and the branching off of the Yamnaya culture.*

& Orlovskaya, 2004a; Nikolova, 2012). It *begins* at the very earliest around the thirtieth century BC, but most of its dates fall within the second third of the third millennium BC. Likewise, Heyd (2011) dates Yamnaya in the west (in the area of Hungary) to the first half of the third millennium BC.

One must also take into account that the derivative cultures (and their derivative languages) can branch off from their matrix no earlier than this time and perhaps much later. Furthermore, we must correlate the breakup of the required proto-language not with the *beginning* of a culture (say, the Yamnaya) but with its *disintegration*, the end of its existence, its replacement by new cultures formed on the basis of Yamnaya—those that might derive from it. By this criterion, the Poltavka culture, Catacomb grave cultures, and others might be derivative.

The Poltavka culture begins in *c.* 2600 BC (Morgunova, 2013), the Catacomb cultures also begin around 2600 BC, but, if we broaden the confidence interval to two sigmas, then the earliest limit will be around 2900 BC (Chernykh & Orlovskaya, 2004b). This is still very far even from the nearest possible date of the language breakup around 4500 BC.

Thus, there is gap of about 2.5 millennia (1.6 millennia at the very least) between the breakup of the language and that of the culture (Figure 1). We must add that the breakup of the language will not immediately follow the fragmentation of a society. So the gap will be even wider.

The inference is clear. *The language spoken by the Yamnaya people cannot have been Proto-Indo-European*: the temporal gap between the breakup of the Proto-Indo-European language and the

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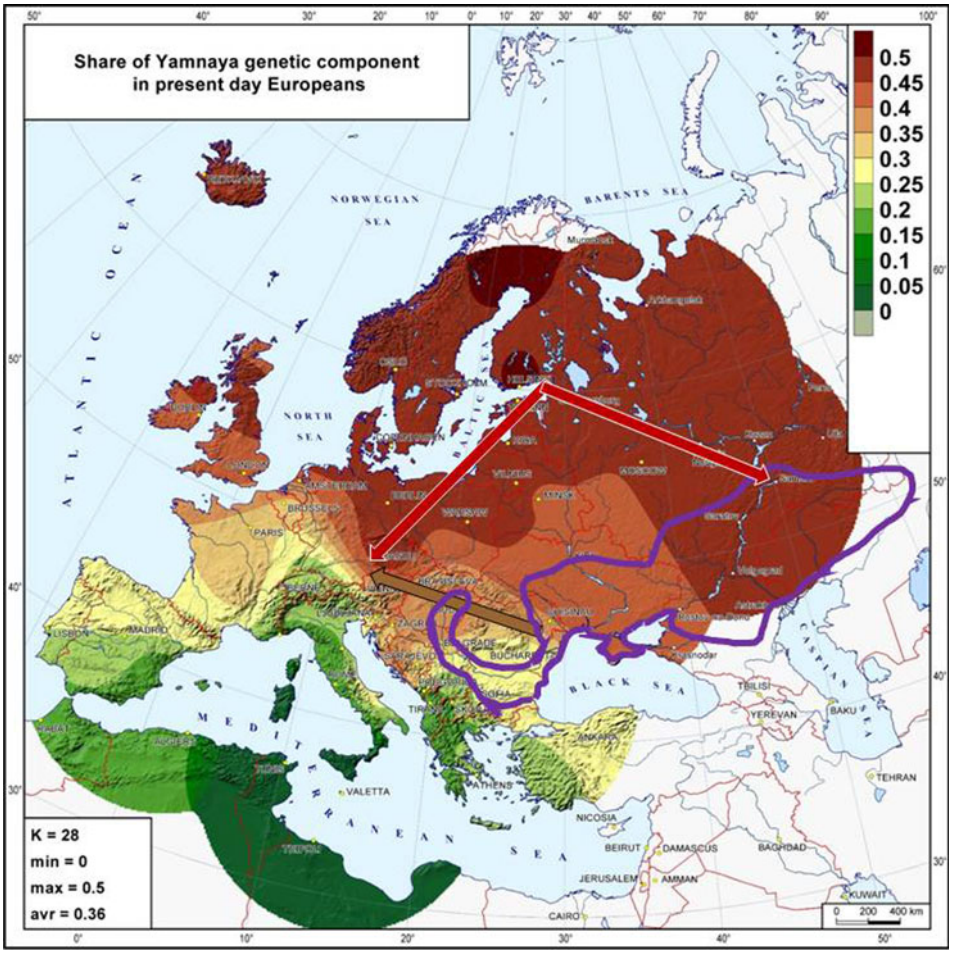

Figure 2. *Distribution of the 'Yamnaya' genetic component in the populations of Europe (data taken from Haak et al., 2015). The intensity of the colour corresponds to the contribution of this component in various modern populations. The scale of intervals is to the right. The purple line represents the borders of the Yamnaya area. The brown arrow shows the direction of migration postulated by the proponents of a Yamnaya origin for the Indo-Europeans of Europe. The red arrows show the direction of the movement of the 'Yamnaya' component in accordance with the gradient shown on this distribution. The map shows that the 'Yamnaya' genetic component is hardly Yamnaya in origin; rather it is a more ancient component originating in the populations of northern Europe from whence it spread both to the steppes and to the cultures of central Europe and elsewhere.* Map by O.P. Balanovsky.

disintegration of the Yamnaya culture is too wide.

The beginning of Corded Ware cultures

The idea of migration from the steppes to the rest of Europe implies that one of the similar cultures must be significantly earlier than the other. The geneticists in question and the archaeologists on their teams argue that Yamnaya is much earlier than the spread of the Corded Ware cultures across central, northern, and eastern Europe (including eastern European Russia). This was the situation imagined

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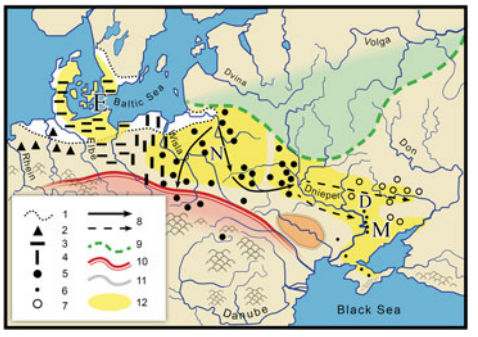

Figure 3. *Ethnocultural situation in central and eastern Europe in the Late Mesolithic and Early Neolithic (sixth to fifth millennia* BC*). 1: Maglemose culture area in the seventh millennium* BC *(after G. Clark). 2–7: Mesolithic cultures of the sixth millennium* BC *of the post-Maglemose cultural tradition (after Kozlovsky and Zaliznyak). 2: de Leijen-Wartena. 3: Oldensloe-Gudenaa. 4: Chojnice-Pieńki. 5: Janisławice. 6: finds of Janisławice artefacts beyond its main distribution area. 7: Donets culture. 8: directions of the Janisławice culture settlement (after Kozlovsky and Zaliznyak). 9: southern border of Mesolithic and Early Neolithic cultures of post-Swidrian and post-Arensburgian traditions. 10: northern border of the settlement area of Balkan-Danubian farmers (late sixth to early fifth millennium* BC*). 11: Bug-Dnestr culture. 12: Neolithic cultures formed on a post-Maglemose ethnocultural basis. E: Ertebølle-Ellerbeck. D: Dnieper-Donets culture. M: Mariupol culture (western variants). N: Niemen culture.* After Koncha, 2004 (from ideas of L. L. Zalisnyak), redesigned by P. Deyneka.

in the twentieth century (by advocates of the steppe hypothesis, including Gimbutas, Mallory, and Anthony). Now, the many radiocarbon dates at our disposal have changed this notion. The Yamnaya dates have been discussed above. Let us now look at the dates of the Corded Ware cultures: all begin in the early third millennium BC—immediately after 3000 BC (Stöckli, 2002; Furholt, 2003a, 2003b). *They are practically contemporary with the Yamnaya culture.*

New ideas about the beginning of the Yamnaya culture

Over the last decades, suggestions have been made that the beginning of the Yamnaya culture (Ivanova, 2004; Morgunova, 2013, among others) is earlier than previously thought. Ivanova (2004), a specialist of the Yamnaya culture, accepts all these suggestions, but has observed a remarkable thing: the main bulk of the Yamnaya culture (in the Ukraine) has no such early dates and the earlier dates are concentrated at the very western and the very eastern edges of this area. Yet, the origin of the culture cannot have spread from both edges to the centre! One of the two concentrations must be false; but if one is false, the other also becomes doubtful.

A source in the north?

I have already stressed (Klejn, 2015a, 2015b, 2015c) a remarkable fact: the strange distribution of the genetic 'steppe' contributions to the Corded Ware cultures and their descendants revealed in Haak et al. (2015): very rich in the north of Europe and increasingly weaker towards the south, in Hungary, just where the western edge of the Yamnaya culture itself is located. This distribution is at odds with the suggestion that the source of the contribution to the Corded Ware cultures is the Yamnaya culture in the south-east; but the same distribution appears quite natural if one suggests that the common source (of both cultural units) is located in the north of Europe—hence the common cause of the genetic similarity (Figure 2).

The respected Ukrainian archaeologist L.L. Zaliznyak (2005) has proposed to shift the date of the Proto-Indo-European language to the Late Mesolithic–Early Neolithic (sixth–fifth millennia BC) so as to better correspond to the glotto-

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chronological datings mentioned above. On archaeological and physical anthropological grounds, he reconstructs the movement of Maglemose and post-Maglemose (Ertebølle–Ellerbeck) populations of Jutland and the south-eastern Baltic region to the Dnieper and Donets areas (Figure 3). Consequently, a large area from the Baltic to the Dnieper was settled by people with similar archaeological, physical anthropological, and supposedly genetic characteristics—the cradle of Indo-European peoples, according to Zaliznyak.

My notes have no intention of detracting from the brilliant success of the geneticists. I merely try to correct their interpretation of it.

Acknowledgements

This article was read in manuscript form by my colleagues E.V. Balanovskaya, O.P. Balanovsky, A.V. Dybo, A.G. Kozintsev, and A.A. Kovalev, and they have given me valuable advice. For corrections to my English I am thankful to S.D. Leach.

Response to L.S. Klejn's Critique of our Article

Wolfganf Haak, Iosif Lazaridis, Nick Patterson, and David Reich

L.S. Klejn's critique of our article, 'Massive migration from the steppe was a source for Indo-European languages in Europe' (Haak et al., 2015), is based on misunderstanding of our claims. Klejn mischaracterizes our article, suggesting we were stating that the practitioners of the Yamnaya culture were speakers of 'Proto-Indo-European': the language spoken prior to the breakup of known Indo-European languages.

If this was our claim, there would indeed be some tension with estimates of the dates for Proto-Indo-European based on rates of language change. As Klejn points out, all estimates of the divergence of Anatolian (the most deeply divergent of Indo-European languages) and other Indo-European languages based on rates of language change are at least ~1500 years older than the archaeologically attested date of the Yamnaya, although such dates are known to be highly dependent on the modelling assumptions that go into them (Chang et al., 2015).

The main problem with Klejn's critique, however, is that when we refer to the language spoken by the Yamnaya, we are explicitly not referring to Proto-Indo-European, but instead to a continuum of languages that is likely to have existed in the western Eurasian steppes well after the splitting off of the Anatolian branch. As we write in our paper, 'the location of the proto-Indo-European homeland that also gave rise to the Indo-European languages of Asia, as well as the Indo-European languages of southeastern Europe, cannot be determined from the data reported here' (Haak et al., 2015: 211).

Klejn mischaracterizes our paper as claiming that practitioners of the Corded Ware culture spoke a language ancestral to all European Indo-European languages, including Greek and Celtic. This is incorrect: we never claim that the ancestor of Greek is the language spoken by people of the Corded Ware culture. In fact, we explicitly state that the expansion of steppe ancestry might account for only a subset of Indo-European languages in Europe.

Klejn asserts that 'a source in the north' is a better candidate for the new ancestry manifested in the Corded Ware than the Yamnaya. While it is indeed the case that the present-day people with the greatest affinity to the Corded Ware are distributed in north-eastern Europe, a major part of the new ancestry of the Corded Ware derives from a population most closely

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related to Armenians (Haak et al., 2015) and hunter-gatherers from the Caucasus (Jones et al., 2015). This ancestry has not been detected in any European hunter-gatherers analysed to date (Lazaridis et al., 2014; Skoglund et al., 2014; Haak et al., 2015; Fu et al., 2016), but made up some fifty per cent of the ancestry of the Yamnaya. The fact that the Corded Ware traced some of its ancestry to the southern Caucasus makes a source in the north less parsimonious.

In our study, we did not speculate about the date of Proto-Indo-European and the locations of its speakers, as these questions are unresolved by our data, although we do think the genetic data impose constraints on what occurred. We are enthusiastic about the potential of genetics to contribute to a resolution of this long-standing issue, but this is likely to require DNA from multiple, as yet unsampled, ancient populations.

Archaeology, Language, and Genetics: Yamnaya and Corded Ware. A Response to Leo Klejn

Kristian Kristiansen, Karl-Göran Sjögren, Morten Allentoft, Martin Sikora, and Eske Willerslev

Leo Klejn proposes an alternative scenario for the archaeological and genetic formation of the Corded Ware culture in northern Europe, and subsequently the spread of Indo-European languages. He wishes to see an early origin in Late Mesolithic cultures of Scandinavia, who migrated south to the Dnieper and Donets areas, where they later turned into Yamnaya. To promote such a hypothesis, he attempts in points 1–4 to undermine the existing chronology of the Yamnaya and Corded Ware cultures, as well as the date for the breakup of the Indo-European proto-language. However, archaeological, linguistic, and genetic data speak against such a hypothesis.

Absolute dating of the Yamnaya and Corded Ware cultures

The Yamnaya culture starts around 3000 BC (online archaeological text to Allentoft et al., 2015), and Corded Ware no earlier than 2800 BC. The majority of dates cluster around 2600 BC, when populations had consolidated. Klejn's arguments on this issue are incorrect.

Proto-Indo-European split

The dates produced by the promising, yet still highly experimental, phylogenetic methods are so variable, ranging from 6700 BC to 4500 BC, that at this point they cannot be considered reliable. The reconstructed Proto-Indo-European vocabulary concerning weaving, wool production, horse breeding, and wagon technology is incompatible with dates earlier than the fourth millennium BC.

Scandinavia as a source for Yamnaya genetic dominance

Klejn's argument is based on contemporary patterns of genetic variation, which are often poor predictors of their distributions in the past. Available aDNA data demonstrate that neither Mesolithic nor Neolithic Scandinavians have Yamnaya affinity (Lazaridis et al., 2014; Skoglund et al., 2014).

The Yamnaya migration and its archaeological and genetic impact in northern and central Europe

It has recently been demonstrated that two male burials of the earliest Corded Ware

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culture in Poland and southern Germany were non-locals and had a hammer-headed pin of steppe type as grave goods (Pospieszny et al., 2015; Sjögren et al., 2016). In another article (Rasmussen et al., 2015) it could be demonstrated that an early form of plague occurred in Yamnaya and Corded Ware populations, which could account in part for the strong decline of the so-called Neolithic DNA. This, however, needs to be tested on Neolithic samples.

Conclusion

We do not exclude the possibility that migrations preceding the Yamnaya expansion into northern temperate Europe could have brought steppe DNA, since a good genetic coverage of Late Neolithic cultures in this region, such as the Globular Amphora culture, is not yet available. However, we contend that in our present state of knowledge the models presented in the two articles (Allentoft et al., 2015; Haak et al., 2015) are the more likely scenarios for what happened during a few dramatic centuries in the first half of the third millennium BC in western Eurasia. We do not claim to have found a definite origin of Indo-European languages. But we have gathered genetic evidence to document a substantial human migration occurring shortly after 3000 BC showing remarkable similarities with one of the models proposed for the spread of Indo-European languages.

Is a Yamnaya Migration to Central and Northern Europe Genetically Confirmed and Does this Explain the Origins of Indo-European Languages?
L.S. Klejn

The two responses have much in common but they also reveal the extent of the divergence in approaches by geneticists and several archaeologists and linguists.

The origins, spread, and divergence of Indo-European languages

First of all, both responses prefer to reduce the main controversy to the secondary question of whether all Indo-European languages have stemmed from the language of the migrated Yamnaya culture, or not all of them but only the Indo-European languages of Europe, or even not all of those. Allegedly, I had accused the authors of tracing all Indo-European languages back to Yamnaya, whereas they did not trace all of them but only a portion!

Well, I shall not reproach the authors for their ambiguous language: it remains the case that (beginning with the title of the first article) their qualifications are lost and their readers have understood them as presenting the solution to the whole question of the origins of Indo-European languages.

Another factor is more important. The authors of the first response specify they had in view not the Proto-Indo-European before the separation of the Hittites, but the language that was left after the separation. Yet, this was still the language ancestral to all the remaining Indo-European languages, and the followers of Sturtevan and Kluckhorst call only this language Proto-Indo-European (while they call the initial one Indo-Hittite). The majority of linguists (specialists in Indo-European languages) is now inclined to this view. True, the breakup of this younger language is several hundred years more recent (nearly a thousand years later according to some glottochronologies) than the separation of Anatolian languages, but it is still around a thousand years earlier than the birth of cultures derived from Yamnaya (see my Figure 1).

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More than that, I analysed in my criticism *both possibilities*—the case for all Indo-European languages spreading from Yamnaya and the case for only some of them spreading from Yamnaya. In the latter case, it is argued that only the languages of the steppes, the Aryan (Indo-Iranian) are descended from Yamnaya, not the languages of northern Europe. Together with many scholars, I am in agreement with the last possibility. But, then, what sense can the proposed migration of the Yamnaya culture to the Baltic region have? It would bring the Indo-Iranian proto-language to that region! Yet, there are no traces of this language on the coasts of the Baltic!

However, the Yamnaya culture, or rather its western variety, has many contacts in the Middle Danube basin (not in the north of Europe), where mixed assemblages are found with Yamnaya burial rites and local ceramics (probably representing marriages of steppe men with local women). This may be reflected in the long-recognized distribution of Indo-Iranian terms relating to power, religion, and war in the Italo-Celtic languages: raj/rex, reg (king), upasti/foss (servant), asi/ensis (sword), etc. (Vendryès, 1917; Koncha, 2005).

I am afraid that in my critical article my main concern about geneticists' treatment of languages was not made plain. *My main concern* is that, to my mind, one should not directly apply conclusions from genetics to events in the development of language because there is no direct and inevitable dependence between events in the life of languages, culture, and physical structure (both anthropological and genetic). They can coincide, but often they all follow divergent paths. In each case the supposed coincidence should be proved separately.

Dating the breakup of the Indo-European proto-language

My opponents' first objection appears to clearly contradict their second objection. The latter, made by both sets of authors, attempts to address my point that there is a gap of more than a thousand years *between the breakup of the Indo-European proto-language and the birth of cultures derived from Yamnaya*. In both responses, the authors draw attention to the state of linguistic conclusions: they point out that the dates of the breakup of the Indo-European proto-language are not facts but hypotheses based on a certain model—here the shaky foundations of glottochronology are referred to. As if the method of *admixture* used by geneticists is not itself based on some model!

Yes, glottochronology is not exact—neither is radiocarbon dating—but, within certain parameters, it is reliable enough, and these bounds of tolerance are determined not by the arbitrary will of some scholars (which may be infinite) but by some commonly recognized factors of uncertainty.

One of the two responses mentions the connection of the later date (fourth millennium BC) with the presence in the Proto-Indo-European glossary of general terms for weaving, horse breeding, wagons, etc. Yet, this connection is not absolute, for borrowed terms might by analogy take forms developed in this language (i.e. a word spread by borrowing could look outwardly similar to forms derived from the proto-language). The whole sixth chapter of the second part of Koncha's (2017) work *Indoevropeytsi* is devoted to the substantiation of this aspect. However, even if we take the most recent date for the breakup of the Indo-European proto-language, the thousand-year gap between this breakup (even if

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without the Hittites) and the birth of cultures derived from Yamnaya remains.

Northern European roots

The authors' third objection concerns the increase of the genetic similarity of European population with that of the Yamnaya culture. This increases in the north of Europe and is weak in the south, in the places adjacent to the Yamnaya area, i.e. in Hungary. This gradient is clearly expressed in the modern population, but was present already in the Bronze Age, and hence cannot be explained by shifts that occurred in the Early Iron Age and in medieval times. However, the supposed migration of the Yamnaya culture to the west and north should imply a gradient in just the opposite direction!

It is precisely this paradox that has led to my suggestion to search for the source of the supposed impact in the north of Europe. My suggestion coincides with the long-noted similarity of a Cromagnon-like population in the northern European Mesolithic with the steppe population of the Early Neolithic and Bronze Age steppes, in particular with the Yamnaya. Researchers of the Ukrainian and Belarussian Mesolithic also advance archaeological hypotheses of this kind.

Causasian roots?

The authors' fourth objection is a continuation of the third. Both of my opponents' responses stress the discovery of the (Trans) Caucasian (Armenian) roots of the steppe population and hold them as a counterweight to the possibility of northern roots. Yet, usually every archaeological culture has several roots in different directions. Which of them is connected with language continuity is very difficult to ascertain.

The new work of Reich's team (Lazaridis et al., 2016) has retrieved data that adds weight to this objection. Large-scale sample analysis has shown that a mighty fifty-seven per cent contribution of eastern hunter-gatherers had entered the genetic pool of the Early Bronze Age steppe; a similar contribution (43 per cent) had entered the genetic pool of the Scandinavian hunter-gatherers. This suggests that the steppe population (including Yamnaya) had a component akin to that of the Scandinavian Mesolithic population (something I had suspected from archaeological and anthropological considerations). The steppe cultures of the Early Bronze Age have partly the same roots as Scandinavian cultures (although not only Scandinavian): the impact of eastern European hunter-gatherers is evident in many other cultures of eastern Europe. As for the Armenian data, they remain completely outside the net of connections drawn by Reich's team.

Further issues

To this set of objections, Kristiansen and his colleagues add two more counterweights to my arguments: 1) in two early burials of the Corded Ware culture (one in Germany, the other in Poland) some single *attributes of Yamnaya origin* have been found; 2) in the Yamnaya and Corded Ware populations an early form of plague (*pestis*) was found (Rasmussen et al., 2015) and *both bacteria stem from one source*. As to the first point, if this is the full extent of Yamnaya infiltration into central Europe—two burials (one for each country) from several thousands (and from several hundreds of early burials)—then it hardly amounts to large-scale migration. As to the second point, the plague could have spread without

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any massive migration (a few isolated contact points may have been sufficient).

I believe I have answered to all the authors' objections. As can be seen, they have not caused me to suspend my doubts.

New genetic results, new interpretations

Quite recently we have witnessed the success of a group of geneticists from Stanford University and elsewhere (Poznik et al., 2016). They succeeded in revealing varieties of Y-chromosome connected with demographic expansions in the Bronze Age. Such expansion can give rise to migration. Among the variants connected with this expansion is R1b, and this haplogroup is typical for the Yamnaya culture. But what bad luck! This haplogroup connected with expansion is indicated by the clade L11, while the Yamnaya burials are associated with a different clade, Z2103, that is *not marked by expansion*.

It is now time to think about how else the remarkable results reached by both teams of experienced and bright geneticists may be interpreted.

The cultural affinities of barrow burials in the Danube basin

I have read the outstanding archaeological works by Volker Heyd with great interest. In a recent work in co-authorship with Frînculeasa and Preda (Frînculeasa et al., 2015) he summarizes the results of many years' excavations of barrows in the basin of the Danube. The results are extremely important. The early date of some burials on the steppe (last third of the fourth millennium BC) is substantiated. Yet Heyd and his co-authors have shown that these early barrow burials (as distinct from those of the third millennium, similar in some ways to Yamnaya burials) are significantly different: pit graves are not rectangular but oval, skeletons are not on their backs with bent legs but curled up on their sides or supine, ochre is scanty, and ceramics are not round-bottomed (as on the Dnieper or Don) but are of Balkan type.

By contemporary Russian standards, this must be characterized as another, separate culture, not Yamnaya. Among Eneolithic steppe cultures classified by Rassamakin and Kotova in the Ukraine, some are very similar to the Lower Danube cultures (Lower Mikhailovka, Kvityana): barrows, oval pit graves, skeletons supine or lying curled on their sides, and cromlechs. The culture in question was one of these, and its possible connection with Yamnaya (kurgan, what else?) is too limited.

Furthermore, with regard to the barrow burials of the third millennium BC in the basin of the Danube, although they have been assigned to the Yamnaya culture, I would consider them as also belonging to another, separate culture, perhaps a mixed culture: its burial custom is typical of the Yamnaya, but its pottery is absolutely not Yamnaya, but local Balkan with imports of distinctive corded beakers (*Schnurbecher*). I would not be surprised if Y-chromosome haplogroups of this population were somewhat similar to those of the Yamnaya, while mitochondrial groups were indigenous.

As yet, geneticists deal with great blocks of populations and prefer to match them to very large and generalized cultural blocks, while archaeology now analyses more concrete and smaller cultures, each of which had its own fate.

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Débat : pout-on expliquer les origines des langues indo-européennes par la migration de la culture Yamna vers l'ouest ?

Deux articles parus dans la revue Nature *(Haak et al., 2015 ; Allentoft et al., 2015) firent sensation. Ils révélaient, du point de vue génétique, qu'une migration de masse de peuples des steppes appartenant à la culture Yamna affecta l'Europe du centre et du nord à l'âge du Bronze Ancien. Leurs auteurs tiennent cet évènement comme formant la base de la diffusion des langues indo-européennes. En réponse, Prof. L.S. Klejn, archéologue à Saint Pétersbourg (Russie), émit certaines critiques à l'égard des déductions basées sur la génétique, en particulier ses répercussions sur la question des origines des langues indo-européennes. Ses remarques furent soumises aux auteurs des deux articles, qui à leur tour présentèrent leurs contre-arguments. Cependant Klejn en vint à conclure que les objections de ces auteurs n'ont pas atténué ses doutes, ce qui l'amène à une seconde réponse.* Translation by Madeleine Hummler

Mots-clés: langues indo- européennes, migration, culture Yamna, âge du Bronze

Diskussion: Kann man den Ursprung der indoeuropäischen Sprachen mit der Zuwanderung der Jamnaja-Kultur nach Westen erklären?

Zwei Artikel, welche die Zeitschrift Nature *in 2015 veröffentlichte (Haak et al., 2015; Allentoft et al., 2015), haben großes Aufsehen erregt. Diese lassen, aus genetischer Sicht, eine Massenmigration der Steppenvölker der Jamnaja-Kultur nach Mittel- und Nordeuropa in der Bronzezeit erkennen. Nach Auffassung der Verfasser bildet dieses Ereignis die Grundlage der Verbreitung der indoeuropäischen Sprachen. Als Antwort darauf äußerte sich Prof. L.S. Klejn (Archäologe in Sankt Petersburg, Russland) kritisch über die genetischen Rückschlüsse, besonders über die Auswirkungen auf die Frage des Ursprungs der indoeuropäischen Sprachen. Diese kritischen Bemerkungen wurden den Verfassern der Artikel vorgelegt und die Letzteren haben dann ihre Einwände dargelegt. Klejn ist aber zum Schluss gekommen, dass die Einwände der Verfasser ihn nicht überzeugen, und untersucht diese Gegenargumente in einer zweiten Antwort.* Translation by Madeleine Hummler

Stichworte: indoeuropäische Sprachen, Migration, Jamnaja-Kultur, Bronzezeit

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