

Indo-Aryans in the Bronze Age



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Chapter 4. Conclusion

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Introduction

0.1. The Problem of the Indo-Aryan Homeland

The origin of the Indo-Aryans is one of the most significant issues in Indo-European studies, and certainly many more scientific works are devoted to it than to any other topic in this field. The historiography is so extensive that the list of works alone could likely fill an entire book. We will not discuss specific viewpoints here. All approaches to solving the problem are well presented and the problematic nature of each of them is shown in the book by E. Bryant (2001: 302-308). Already travelers of the 16th century noted parallels between European and Indian languages. After Europeans became acquainted with Sanskrit, a scientific understanding of this phenomenon began, and W. Jones in 1788 noted the parallels of Sanskrit with Gothic, Celtic and Persian. This sparked debate about the homeland of these languages, with various areas from the Near East to northwestern India suggested. In 1816, Thomas Young formulated the idea of Indo-European languages, and from this time we can date the existence of the Indo-European problem, of which the Indo-Aryan one is an integral part (Bryant 2001: 16-20, 35).

In the most general terms, we can talk about three main options for the Indo-Aryan homeland: in India, in steppe Eurasia and in the Near East. The complete impossibility of the Indo-Aryans originating in India has been demonstrated in detail (Witzel 2001). Without going into details, we will present only the main linguistic arguments. Indo-Aryan languages belong to the Indo-European language family, whose origin in India is implausible. This is particularly evident because earlier linguistic substrates in India contain words related to local flora, fauna, and economy that were borrowed into the Indo-Aryan languages. Eastern Indo-European languages (Indo-Iranian and Balto-Slavic) are *satem* languages, unlike most western languages, which belong to the *centum* group. The satemization of these languages is a later phenomenon when the Proto-Indo-European began to split. This process began when this group separated from the main core. Therefore, people who spoke languages of this *satem* group could not remain in the place of their common homeland. It is also impossible to consider India as an Indo-Iranian homeland. This is because the Iranian languages lack the innovations and loanwords that appear in the Indo-Aryan languages, as well as borrowings from the substrate languages of the Indian subcontinent. While there are a number of phonological innovations in Iranian (for example, the transition of Proto-Indo-European and Indo-Iranian ‘s’

to ‘h’), Indo-Aryan is more structurally innovative. This suggests that its speakers left the Proto-Indo-Iranian area earlier than Iranian speakers. There are obvious Indo-Iranian borrowings in Proto-Finno-Ugric. In addition, the Rig Veda contains brief and vague references to migration in east and south directions, migration through mountain passes and the crossing of the seven Saraswati rivers. Finally, in the Rig Veda cultural elements new to Hindustan appear (chariots, a new religion, etc.), which have parallels in other Indo-European cultures. This list does not exhaust the argument against the homeland in India (see Witzel 2001 for more details). Therefore, we will not discuss this option further.

Accordingly, there remain two options for the Indo-Aryan homeland, which coincide with two options for the Indo-European homeland. This is quite natural, since the Indo-Aryan problem cannot be separated from the context of the Indo-European problem. There are three main approaches to solving the latter (the idea of the Near Eastern homeland has two different approaches). The most recognized theory is that about the origin of the Indo-Europeans in the steppes of Eastern Europe (Kurgan or Steppe theory) (Mallory 1989; Gimbutas 1994; Anthony 2007). This theory will be discussed in detail below. The second theory connects their origin to the Neolithic complexes of Asia Minor. Accordingly, the spread of Neolithic cultures to Europe and the east from this region is seen as a sign of the spread of Indo-Europeans, including the Indo-Iranians. The Neolithization of Europe from Anatolia is widely accepted, and the importance of the Near East in the spread of animal husbandry and agriculture to the east is undeniable. It is therefore suggested that by c. 6000 BC Proto-Indo-Europeans had moved eastward. This movement led to the emergence of complexes like Mehrgarh in Pakistan. Subsequently, under the influence of traditions from Iran and Pakistan, the Harappan civilization emerged. Many of its rituals were preserved in India during the Vedic period. At the same time, the compilers of the Rig Veda were familiar with cities, and there is no evidence that these cities were not Indo-Aryan (SG – it is a wrong opinion). An important argument is that the culture of the Vedic period had many Iranian features, which indicates that the Iranians were formed somewhere in the neighboring region of Iran (Renfrew 1987). However, all this assumes a very early separation of western and eastern Indo-European languages to one another, and is at such a distance that excludes contact between these groups, which does not correspond to the linguistic material. Moreover, what was previously

considered the ancient European hydronymy of Europe is the Indo-Europeanized hydronymy of the former population, who spoke languages close to the Basque language (Vennemann 1994), in other words, the languages of the Dene-Caucasian family. Therefore, the Neolithization of Europe was associated with the speakers of precisely these languages, and the generally accepted point of view that the Neolithic population of Europe was non-Indo-Europeans is completely true. A second option attributes the Trypillian culture to the Indo-Europeans, which later contributed to the formation of the Slavs. The bearers of this culture may have transmitted the Indo-European language to the Eneolithic steppe tribes, leading to the separation of the Indo-Iranian languages. The later Indo-Iranian migrations were carried out along the route prescribed by the steppe theory, but since there are no steppe inclusions in India and Iran, this option is less likely (Renfrew 1987: 203). Here the same problem with the Neolithic substrate of Europe remains. Additionally, the challenge of explaining the transfer of the 'Trypillian' Indo-European language to the steppe arises, along with numerous issues associated with the 'steppe' hypothesis.

There are ideas that Neolithic migrants could speak Proto-Semitic or Proto-Kartvelian languages (Kristinsson 2012: 398, 399). In the European IE languages, many terms related to agriculture are referred to a substratum non-Indo-European vocabulary, presumably connected with the European Neolithic. For some of these words, Semitic origin is indicated (Kroonen 2012: 239-55). There is also an opinion that the population of Neolithic Europe spoke languages that belonged to the Hatto-Sumerian language family (Schrijver 2018: 360, 361). However, the later Hattian language belongs to the North Caucasian languages, and the latter have some relationship with Basque. Therefore, we may assume that representatives of this family, including the North Caucasians, lived in Anatolia, with the exception of its east. In addition, this makes it possible to exclude Asia Minor from possible PIE Homelands.

Finally, the third theory suggests the origin of the Indo-Europeans in the Armenian Highlands (in the South Caucasus and Northern Mesopotamia). It is based on the indisputable fact that the Proto-Indo-Europeans were, first of all, farmers, which is carefully avoided by supporters of the 'steppe' hypothesis, and which is the basis of Renfrew's hypothesis. At the same time, changes in the economy, which are reconstructed for different stages of development of the early Indo-European peoples, correspond to the nature of the processes recorded by archaeology only in this region. Reconstruction of the natural environment and contacts of the speakers of Proto-Indo-European with the ancestors of the North Caucasians, Kartvelians

and Semites also point to this region. Finally, the models of the spread of Indo-Europeans from the Near East, reconstructed on the basis of linguistic and archaeological evidence completely coincide in the most general terms, and the appearance of Proto-Indo-European can be attributed to the Pre-ceramic Neolithic of the Near East and dated to about the 7th millennium BC (Gamkrelidze and Ivanov 1995; Grigoriev 2002: 320-25).

This localization of the Indo-European homeland also corresponds to the Nostratic theory, which assumes a distant, very ancient relationship between the Indo-European, Kartvelian, Elamo-Dravidian, Uralic, Altaic, and Afroasiatic (Semitic-Hamitic) languages. There is a large list of words indicating the relationship of these languages. The Nostratic languages lacked common words for pottery, cattle and sheep breeding, and agriculture, bow and arrow, which allows Nostratic unity to be dated to the Paleolithic period. Based on the reconstruction of the natural environment, flora and fauna, reflecting a subtropical region, the homeland of the Nostratic languages is placed in Southwest Asia (Illych-Svitych 1971; Dolgopolsky 1998: 5-8, 19-38, 64). Afroasiatic languages are not considered by some authors within the framework of Nostratic unity (Peiros and Shnirelman 1992: 137). However, a comparison of Indo-European and Afro-Asiatic zoonyms shows their similarity, which is explained by the reality of Nostratic unity in the area of the so-called Fertile Crescent, and the split of Afro-Asiatic languages from it in the Levant at the very beginning of domestication around the 11th millennium BC (Blažek 2013). However, this does not necessarily indicate a linguistic relationship, since it may be the result of borrowing along with the adaptation of productive forms of economy. Nevertheless, it points to a very specific region and timespan. The separation of the Uralic languages, in which traces of familiarity with domestication are completely absent, should probably be dated to the Late Paleolithic. Of course, at this stage we cannot even talk about Proto-Uralic. It is more legitimate to call this hypothetical language Pre-Proto-Uralic.

It should be noted that the Nostratic theory is not universally accepted and has been criticized many times, in particular for its most important parallels between Proto-Uralic and Proto-Indo-European. It has many significant problems in the evidence base, since many of the reconstructed Nostratic forms are questionable, others are very short and may have been caused by coincidences, and others differ semantically. Finally, many forms may have arisen as a result of contacts, rather than due to common origin from a single root (Campbell 1998). For our problem, the question of common origin is not as fundamental as the possibility of origin from a single region. Archaeology is unlikely to be able to solve this problem.

Recent studies have shown that the Indo-European languages, culture, and genes spread from this region and that migrations from north to south never occurred. It was also shown that this happened quite early, in the 6th–7th millennia BC period, which does not fit into the framework of the steppe homeland, which assumes the time of the Proto-Indo-European from the 4th millennium BC (Grigoriev 2021a; Heggarty *et al.* 2023; Lazaridis *et al.* 2022). The only possible explanation for this from the perspective of the steppe Indo-European homeland is the idea of the existence north of the Caspian and Aral seas, of some pre-Indo-European Eurasian language, close to Proto-Uralic, whose speakers began to contact speakers of northwestern North Caucasian languages, as a result of which Proto-Indo-European was formed (Bomhard 2019: 9, 15, 25). However, it would be too exotic to explain the formation of a new language family due to contacts of two different languages. In such cases, local languages such as Pidgin are formed, characterized by greater lexical mixtures and simplified grammar, which cannot be said about Proto-Indo-European. The second option is the idea of the existence of some Pontic language in the Caucasus, from which Proto-Indo-European separated, whose speakers migrated to the steppe (Colarusso 2019: 134). However, this is also a fantasy, although it already suggests the vector of movement from the south. But these hypotheses cannot be taken into account when constructing explanatory models, and it is the Near Eastern localization of the Indo-European homeland that is more acceptable.

However, the fact that Indo-Europeans originated in the Near East is not decisive for solving the Indo-Aryan problem, since migrations from the Near East formed the steppe population of Eastern Europe already at the beginning of the Eneolithic, and it was there that Indo-Iranian languages could have emerged, after which their speakers migrated to the south, as the steppe theory prescribes for them. Therefore, the task of this work is to consider this problem in isolation from the problems of the formation of other Indo-European peoples.

In the original version, M. Gimbutas focused primarily on the spread of Indo-Europeans from the steppe into Europe, and did not describe in detail the migrations of the Indo-Aryans or Indo-Iranians, although the common Indo-European homeland in the steppe implied that they must have migrated from this region. This was not contradicted by the fact that in the Early Iron Age the steppes of Eurasia were inhabited by Scythian and Sarmatian tribes who spoke Iranian languages. Therefore, this was assumed by many, but was not clearly formulated based on archaeological material. With the discovery of the Sintashta sites in the Southern Urals, they were associated with the Indo-Iranians. Their relationship with subsequent

Andronovo sites was shown, as well as their origin due to the impulses of previous cultures of Eastern Europe (Babino, Abashevo, Catacomb cultures). Since at that time the Catacomb culture was associated with the Yamnaya, which in turn was associated with the earlier Eneolithic substrate of the steppe, this was included in the Kurgan theory of M. Gimbutas. The movement of the Andronovo tribes to the south was also shown, which finally confirmed the view that these tribes spoke Indo-Iranian languages. The main role in the formulation and development of this concept belongs to E.E. Kuz'mina, and all other studies in this field followed her (Kuz'mina and Smirnov 1977; Kuz'mina 1994, 2007).

The purpose of this book is to show the inconsistency of this theory and propose a new approach to its solution, based on the Near Eastern localization of the Indo-European homeland. I am very grateful to the colleagues who reviewed or read this manuscript, which helped to avoid a number of errors: J.P. Mallory (Queen's University, Belfast, UK), A.M. Lubotsky (University of Leiden, the Netherlands), V.A. Novozhenov (UNESCO Center for the Rapprochement of Cultures, Almaty, Kazakhstan), R.A. Lytvynenko (Donetsk National University, Vinnitsa, Ukraine), E.V. Kupriyanova (Chelyabinsk University, Russia), E.S. Yakovleva (Astra LLC, Chelyabinsk, Russia), Zhivlov M.A. (Russian State University for the Humanities / National Research University Higher School of Economics, Moscow, Russia), as well as colleagues in Chelyabinsk who read this manuscript and participated in its discussion. Special thanks to O.I. Orlova (Museum-Reserve 'Arkaim', Chelyabinsk, Russia), who prepared a number of illustrations for this book, and to Rhys Anthony (Aberystwyth University, UK), who edited the English text. His persistent struggle with my complex sentences and his passion for elegant style made this text more accessible to the reader.

0.2. Methodological problems of homeland reconstruction

0.2.1. Ethnic Processes and the Limits of Linguistics

Before discussing the issue in detail, we must address some methodological challenges in ethnogenesis studies. These challenges are complex because language and material culture are not identical, and direct comparisons between them are impossible. Therefore, there are well-reasoned opinions that it is impossible to reconstruct a language based on the study of archaeological cultures. This requires written sources (e.g. Lamberg-Karlovsky 2002). In this work we discuss the major ethnic groups that existed in Eurasia during the Bronze Age. However, in many ways, it is an abstraction. Ethnicity is certainly related to language and culture. Nevertheless, this relation is not direct, since the concept of 'ethnicity' is not so much about

language and culture, but about identification, built on the awareness of one's commonality (including linguistic one), one's roots and traditions. Therefore, language and culture relate to each other not directly, but through ethnicity, and also through very complex and not always obvious connections. However, it is completely impossible to study identification using archaeological material. Even at the individual level, we often encounter situations where self-identity is fluid, ambivalent, or uncertain. In Russia one can encounter representatives of the Finno-Ugric peoples who have lost their language some generations ago, but have retained their identification or have dual identification. In some cases, an individual's identification can change more than once, regardless of language. But the study of these problems in antiquity remains beyond our capabilities. Therefore, the subject of our studies remains the spread of languages. Nevertheless, we must also constantly keep this issue of self-identification in mind. In cases where we have some sources on a certain territory, and we know the names of peoples, we are dealing with formal identification, but not with information about what language this or that people spoke. Direct identification can lead us to completely false conclusions, of which there are many examples. The Russians and French adopted their ethnonyms following the arrival of Germanic tribes (more widespread in Gaul and more limited in the lands of the Eastern Slavs), and the Bulgarians did after the coming of a Turkic tribe. Nevertheless, this did not lead to a change of language in these territories, densely populated by agricultural communities. It did not even have a decisive impact on the language. The identity of the ethnonyms 'British' and 'Breton' does not indicate that they spoke the same language. The Celtic language of the ethnonym was supplanted in the first case by English, and in the second by French, and it survived in small areas with extremely limited use.

An even more complex situation is found in the Indo-Iranian languages. In Central Iran there are the northwestern Iranian dialects of the Iranian Zoroastrians, Yazdi and Kermani, named after the cities of Yazd and Kerman. The Zoroastrians themselves call their language *darī*, while the Zoroastrian emigrants to India (speaking Indo-Aryan Gujarati) are called Parsis, reflecting their arrival from Persia. However, the languages of their worship are Avestan and Pahlavi. In Persia, the speakers of Yazdi and Kermani are called *gabri*, which goes back to the Turkic *gäür* (which in turn goes back to the Arabic *kafir* 'infidel'), giving in Persian *gaur*, *gabr* (Molchanova 1999: 184). However, in Afghanistan there is also the Dari language, which is related to the southwestern Iranian languages and it can be traced to the era of Persian-Tajik unity in the 9th–15th centuries (Moshkalo 1997: 121). There are also Nuristani languages there, which separated from the Indo-Iranian languages very early, and they were

also called Kafir (Edelman 1999a). Thus, we have a wild mixture of exonyms and endonyms, which has nothing to do with defining a language or ethnic group. If we had information about Afghanistan only from scanty written sources, from which we would have gleaned information about the presence of Kafirs and the Dari language there, we could well draw parallels with the northwestern dialects of Central Iran. The identification of the Parsis of India with the speakers of the Persian language would also be obvious.

Another example are the Iranian ethnonyms and toponyms of Sarmatian origin among the Turkic peoples in Central Asia. Particularly noteworthy is the name of the clan *Tocharistan* (*Tokarstan*, *Tokarstan*) among the Kazakhs of the Suan tribe from the Elder Zhuz. They got it from the Tochar tribe, which was part of the Saka-Massaget confederation and spoke the Iranian language (Tolstova 1978). Thus, the ethnonym went back to the Tocharian-speaking people, then passed to the Iranian-speaking, and finally to the Turkic-speaking people.

This situation is also relevant for earlier periods, perhaps even more so. While the Middle Ages provide us with many sources to assess various situations, when studying the Bronze Age, we are often forced to rely on isolated pieces of information, and upon discovering a familiar name of a people, we might be tempted to draw conclusions about the language spoken in that region. However, the Hittites got their name not because of their language, but because they founded their kingdom with its capital at Hattusa, in a region inhabited by the Hattians who spoke a North Caucasian language. They themselves called their language *nišili*, which is also not an ethnonym, since it only reflects the fact of the appearance of the first notable Hittite leader Pithana in Neša (Kaneš) around 1750 BC (Watkins 2004: 551; Barjamovic *et al.* 2012: 38, 40, 48). As a result, many of these names were linked to geographic areas, and such ethnicons lacked ethnic significance. Often in antiquity ethnonyms did not exist, since there were tribes, but there were no ethnic groups, in the modern sense. A striking example is Greece, where groups like the Achaeans, Dorians, and Argives existed separately, and the differences remained until the Classical period. The concept of 'Hellenes' that unites them arose later, and was firmly established only with the beginning of the Olympic Games, and Homer's 'Iliad' played a huge role in the formation and strengthening of this identification. However, even then, many genealogies retained the memory of a non-Greek origin (Finkelberg 2005: 30, 35–41, 107, 168, 172–76).

The most paradoxical is the ethnonym 'Veneti', behind which Slavs, Germans and Celts have been seen for many years. This connection has some basis, as we know of the Slavic tribes of the Antes and Veneti, supported by written sources. Other sources also

indicate that the Veneti lived in Northern Poland. As a result, a wide area of their presence is traced from the Baltic to the Carpathians (Gvozdanović 2012). In Roman times, we also find the Celtic tribe Venetos in Brittany. Additionally, we can include the Germanic-speaking Vandals, which further expands the reach of this ethnonym to Iberia and North Africa. Italian-speaking Venetians can also be added to this list. Unlike the Hittites, this ethnonym is not tied to a specific locality. It refers to the Indo-European group of Veneti, who lived in Northeastern Italy. Approximately 200 short inscriptions from 900-182 BC have survived from this group, first written in the Etruscan alphabet and later in the Latin alphabet. Their language was close to another extinct Indo-European language, Illyrian (Mallory and Adams 1997: 620, 621; Wallace 2004; Gvozdanović 2012: 34-37). This name likely persisted from tribes that were widespread across Europe before the arrival of speakers of Celto-Italic, Germanic, and Balto-Slavic dialects. I am inclined to believe that this was the language of the peoples associated with the Corded Ware cultures (Grigoriev 2022a). This is perhaps the most striking example of the fact that ethnonyms found in the text cannot be used with confidence to draw conclusions about the language. As these examples show, ethnonyms can be introduced by dominant newcomers, while the language of the previous population is preserved, leading to the linguistic assimilation of the newcomers. On the other hand, the local ethnonym may be retained by newcomers who mix with the local population and assimilate them. As a result, fixing ethnonyms in rare written sources is not a reliable way to reconstruct ethnic processes, although it provides additional clues.

Often in reconstructing a language one relies on toponymy and onomastics. However, while toponymy can indicate that this language was widespread in this region, but it is not always possible to determine when a specific toponymic layer appeared. With personal and divine names, we encounter different challenges, even in cases of available written sources. As a rule, they rarely provide us information about the main population of the country, mainly about the rulers, and the more ancient, the stronger this tendency. Below we will discuss the Kingdom of Mitanni, in which the kings and gods had Indo-Aryan names, but even the dynasty was Hurrian, and the population was Hurrian- and Semitic-speaking. Likewise, we cannot determine the language of Babylonia by the Kassite dynasty. According to available sources, the Trojan king with the Greek name Alexander does not indicate that a Greek dynasty ruled the city. The other Greek names of the Trojan cycle, Cassandra and Castianeira, do not indicate this either. Moreover, it does not even indicate that there was a noticeable Greek population there. The population of Troy spoke Thracian, despite the fact that in the Iliad most of the Trojans have Greek names (Gindin and Tsybursky 1994: 19, 20, 29-31). Moreover,

this does not mean that the Greeks lived anywhere nearby. A similar fact is the presence of Thracian and Phrygian names in the genealogical lists of the Mycenaean kings (Woudhuizen 2018: 30, 34-40). All this is explained by the fact that in the Balkan-Anatolian tradition, a royal power was inherited through the female line, and the king could be a person even from a foreign-speaking tribe (Finkelberg 2005: 33-37, 65-108). Naturally, his circle included other people from his clan. Nevertheless, their presence does not allow us to definitively judge the language spoken. However, the names still suggest that this ethnic component existed in the region, and this data can still be useful.

Additional information comes from language contacts with neighboring peoples, which often reflect the presence of large populations. In the absence of written sources, the standard procedure for identifying such contacts is to study borrowings from other languages. This approach is generally quite reliable. Borrowings depend not only on the timing of contact but also on the nature of the interactions between groups. For instance, neighboring peoples might not exchange words if they were enemies or in conflict. In contrast, the most intense borrowing typically occurs through close social relationships, such as intermarriage. However, this is not always possible. Among certain populations, like the modern Yezidis, intermarriage with outsiders results in exclusion from the community. Moreover, in some cultures, marriages between different castes are strictly prohibited, further restricting linguistic exchange. Therefore, when I refer to the nature of contacts, I mean both the specific social conditions influencing interaction and the different times these interactions occurred. In many cases, the timing of these contacts can be estimated. For example, if two neighboring languages have both diverged from the same proto-language and share a borrowing from a third language, it is often concluded that the borrowing occurred during the period when the proto-language was still in use. However, there may be situations (for example, migrations through the areas of both languages or some other reasons) when parallel borrowings occurred in both languages. In some cases, a borrowing might have entered one language and then been transferred to the other. To refine these conclusions, linguists analyze the phonetic features of borrowings to determine the chronological stage of the language, though this is not always reliable due to subsequent phonetic changes.

In addition, the processes of ethnic interactions are complex and ambiguous. When we look at a map of Anatolia from the 15th to the 13th centuries BC, we see the vast Hittite Kingdom, which may lead us to assume that the Hittite language was widespread throughout the region. Fortunately, in this case, we have written sources that tell us otherwise. In addition, Anatolia

was inhabited by the Hattians, who spoke the language of the North Caucasian group, as well as the Luwians and people spoke Palaic related to the Hittites, as well as speakers of the Luwic languages, from which Lydian, Carian and Lycian were subsequently formed. Greeks, Phrygians and Thracians lived in the west, and Armenians in the east. Even in the heart of the kingdom, in Hattusa—conquered by Annita around 1730 BC—the linguistic situation was complex. For a very long time, the majority of its population spoke Hattian, many components of Hattian culture and religion were adopted by the Hittites, and in the following centuries the importance of Hattian gradually decreased, and the use of Hittite increased. After Annita's conquest of Purushanda inhabited by Luwians, the Luwian population began to appear in Hattusa and grow all the time. The use of Hattian disappeared only in the 14th century BC, while the use of Luwian continued to rise, becoming the spoken language by the early 13th century BC. However, Hittite remained the official language until 1180 BC (Watkins 2004: 551, 573; Yakubovich 2020: 222, 224, 225, 232; Yakubovich 2022: 7, 11-14, 19). As a result, even in the capital, the language of the dominant ethnic group rarely prevailed. In other regions, the previous linguistic substrates were preserved even longer.

Language change also did not occur as a result of the Norman Conquest of England, a classic case of elite dominance that rarely leads to linguistic dominance. Although the elite spoke French for a long time and maintained close ties with France—resulting in numerous borrowings and influencing the peculiarities of English spelling—this did not alter the core of the language. Therefore, this widespread idea that some small groups of steppe tribes could conquer the densely populated areas of the agricultural communities of Europe, the Near East or India, and spread their language through elite dominance is highly questionable.

To understand how we can study the language spread, we must briefly touch on the features of these processes. It is well known that languages develop from some parent language, they are transforming gradually and sometimes split, forming new divergent languages. In ancient times, with an incomparably lower intensity of communications, this happened more actively than now; dialect features of individual areas were formed. This evolution depended on specific conditions. For example, in flat regions like the steppes of Eastern Europe, communication between communities was more frequent, especially with neighbors, which led to fewer boundaries between dialectal areas. There was a classic situation of a language continuum, where minor differences increased with distance, but they could also be leveled out by some subsequent events. In contrast, mountainous regions fostered more intense dialectal divergence, which tended to be more stable over time.

It is indicative that in Western Anatolia, stable areas of pottery tradition existed during the long Bronze Age period, determined precisely by geographical boundaries (Fidan *et al.* 2015). Therefore, in many similar cases, conditions were created for the formation and development of individual dialects or dialectal areas. Accordingly, in the Near East the possibilities of splitting the Proto-Indo-European language were much higher than in the steppe, although even there the possibility of contacts with speakers of similar dialects remained, slowing the process of language differentiation. Optimal conditions for this appear in the case of migration of some group to a remote region and loss of contacts with speakers of related dialects, but even this process is rather slow.

An important method for solving the problem of the primary localization of speakers of a language is linguistic paleontology, which allows, based on the vocabulary of the protolanguage, to reconstruct the natural environment, flora and fauna, type of economy, and so on. However, there are two key limitations to this method. The first is caused by the fact that the climate, flora and fauna change over time, and sometimes it is not taken into account, as a result, the time of the proto-language is estimated incorrectly. A striking example is the widespread denial of the localization of the Indo-European origins in Northern Mesopotamia on the basis of the so-called 'birch argument' (e.g. Safronov 1989: 48), although during the excavations of Tell Maghzaliya in Iraqi Kurdistan, pollen of this plant was identified in the Early Neolithic layer (Zelikson and Kremenetsky 1989: 288). In addition, I myself saw birch groves in the mountains of Southern Armenia. The second, and more fundamental, question concerns the definition of a protolanguage. This question has an equally fundamental and extremely simple answer: this is the language from which the languages of this group were formed. However, a protolanguage is reconstructed based on vocabulary recorded in descendant languages, and some of this vocabulary may have been lost over time, particularly due to migration. In addition, this method allows us to reconstruct only the state of the protolanguage at the time of its disintegration, and we know nothing about the earlier state of the protolanguage and the duration of its existence. Moreover, there may have been dialects of the protolanguage in other regions that left no trace in the form of known descendant languages. In other words, if we reconstruct the area of Proto-Uralic or Proto-Dravidian on the basis of vocabulary, this does not mean that speakers of this language who did not become the ancestors of speakers of known languages could not live in other areas. Therefore, this is a more complex problem than it seems at first glance.

Migration is also the only opportunity for the emergence of a language in a new area. Although

some archaeological literature suggests that languages spread through trade relations, this idea is not worth considering, let alone debating. Migration is always a forced process caused by some extreme circumstances that do not allow people to stay in their homeland. Migrations over short distances could be stimulated by overpopulation, which caused an outflow of part of the population to neighboring regions. Probably, this model was the basis for the spread of Neolithic cultures in Europe. But unexpected long-distance migrations could be caused by climate shocks such as droughts or frosts. The likelihood of such a reaction to the problem was especially high during long periods of aridization, which reduced the adaptive capabilities of people. Sometimes we see large-scale synchronous migrations caused by global disasters, such as volcanic eruptions. Regardless, migration was always a forced process, and this is the only way to spread the language in a new area.

However, as a rule, another population already lived there, and the further situation depended on many sociocultural factors, but primarily on demography. There are various descriptions of patterns of substitution of one language for another (e.g. Renfrew 1987: 124-43), but they are usually quite artificial, and in reality they often operate simultaneously, but in different proportions. As we have seen in the above examples, elite dominance is not able to provide linguistic assimilation, since this requires a demographic base. Language is an extremely conservative human function, since it is closely connected with thinking, and people must have an urgent need to adopt the alien language. This can be facilitated by situations where the local population is incorporated into the group of newcomers, as was the case in Athens, where the institution of *synoecism* existed, and the Pelasgians became citizens, forming mixed families. However, it took a huge amount of time to assimilate even a small territory of Greece.

For example, the process of linguistic assimilation began with the arrival of relatively small groups in Euboea and eastern Boeotia during Early Helladic IIb, around the 24th century BC. The first phase of Lefkandi I spanned a substantial period of 150 to 250 years, depending on which type of chronology we prefer. Adding here the period of Early Helladic III, when the penetration of this tradition into the Peloponnese took place, we get a duration of several hundred years, and the process was far from being complete, and its echoes persisted until the Classical period. In this case, the proportion of migrants relative to the autochthonous population was low, which is why such a long period was required. Despite this, we see clear evidence of Anatolian cultural elements and eastern genetic influxes, which indicate the demographic basis of this process, as well as the mixing of traditions and genes of newcomers and local people (Grigoriev 2022b).

Therefore, the emergence of speakers of a new language, which would eventually become dominant, should be clearly reflected in archaeological and palaeogenetic materials. If we see a complete change of genes and culture, we can assume that the previous population was displaced or exterminated. However, such cases were limited to specific regions and were not the norm in the broader global processes under discussion. What is important in this case is that the process of assimilation itself lasted hundreds of years, which we can clearly see in the examples of Greece and Anatolia. Ultimately, the speed of this process depends on the balance of the newcomer and local population and on a series of social aspects. Sometimes these processes can occur faster. Below we will discuss that in some regions Indo-Aryan was replaced by Iranian. When speakers of two related languages come into contact, assimilation processes proceed faster, especially since in antiquity these languages were much closer to each other than they are now. However, even in such cases, the adoption of a new language did not happen overnight. Different languages could coexist in the same region, bilingualism sometimes developed, and these transitions often spanned long periods of time.

Other scenarios are also possible, such as contact between groups that spoke dialects of the same language, with these dialects having diverged from the parent language at different times. In such cases, a dialect with mixed features can easily emerge. If loanwords from this mixed dialect are found in neighboring languages, they may be mistakenly interpreted as evidence of successive contacts with two distinct dialects. The possibilities in these situations can vary widely. A striking example is the existence of two dialects in the modern Ossetic language, Iron and Digoron. At the same time, Digoron is very archaic. It reflects the state of Iron about 1000 years ago. In addition, these dialects have been in contact for a long time and gradually converged (Isaev 1999: 322). There is, however, an opinion that these dialects are very close and separated only 200 years ago (Novák 2013: 29). It is possible that this is due to constant interaction. In any case, Digor is more archaic, and dialects of different states can coexist. Similar situations probably existed in ancient times, and loanwords from such dialects into the languages of neighbors can be perceived as loanwords of different times.

0.2.2. *Ethnic processes and archaeology*

Material culture changes more quickly than language, which can sometimes create the impression that a new language was adopted in an area, even though this may not have happened. A change in culture does not necessarily mean a change in language. In Central Anatolia, the culture was quite similar, despite the abundance of languages. However, understanding

archaeological cultures can be even more complex. The main problem is what changes should we track? Pottery is the most common material found in archaeological excavations, and despite claims of complexity, it is often used as the main basis for identifying archaeological cultures. In the Fyodorovka culture, funeral pottery is the same from Southern Siberia to the Transurals, yet the rituals can be very different. Funeral rites reflect not only a group's traditions but also its beliefs and identity. Thus, funeral rites should be the most accurate reflection of ethnic and linguistic changes. However, this cannot be taken as a direct indication of these changes.

We can complicate the situation with ceramics even more. When discussing technology of its production, there are adaptive and inherited techniques. The first includes the choice of one or another raw material: if the usual raw materials are not available in the region, potters are forced to use local ones. The latter refers to the methods of vessel production, which tend to be stable over time. When these methods change unexpectedly, it may suggest migration. Additionally, African ethnography has shown that these skills are often closely tied to ethnic groups. In contrast, decoration style and technique are more susceptible to changes in fashion and can evolve more quickly when populations come into contact. However, if the ornamentation has a semantic aspect, then it can also reflect ethnic processes (Gosselain 2000: 203-06, 209; Kroon *et al.* 2019: 2, 3; Tsetlin 2010: 23-26, 30, 76). In all cases, borrowing both technology and the stylistic elements of ceramics is impossible without direct contacts. However, production techniques often reflect the traditions of the population more deeply than the ornamentation. Unfortunately, most studies are based specifically on the shapes and ornamentation; technological studies are quite rare and are not carried out for all collections. As a result, these studies often record the adoption of certain traditions and inclusion in new socio-economic systems, but they cannot determine whether the potters were from the indigenous population or newcomers. Furthermore, even when earlier production techniques are preserved, it does not necessarily indicate the preservation of the language, as potters might have been women while language carriers were men.

However, can we rely on male-dominated industries like metallurgy to understand ethnic changes? Across the vast Eurasian landscape, similar and sometimes identical metal objects spread rapidly. Metallurgy is a complex system that involves the sourcing of raw materials, ore smelting, casting, forging, and shaping metal objects. The transfer of this technology required direct contact with the people who possessed it, either through living nearby or migration. This system was also influenced by the socio-economic development

of the society and varied depending on the type of technology, such as arsenic *versus* tin alloys. This complexity can be clearly traced at the statistical level (Grigoriev 2017, 2018a). Arsenic alloy production usually took place during the ore smelting stage, requiring low temperatures and a reduction atmosphere in the furnace. This was necessary because arsenic oxides evaporate at high temperatures. When making copper tools, casting and forging at high temperatures were avoided to prevent arsenic loss. These limitations made it difficult to produce complex shapes. Thus, adopting this entire technological system required close contact with those who practiced it. However, low-smelting ores are less common and of lower quality than refractory ores. The switch to tin alloys solved these problems and allowed for increased production and more complex objects. However, tin deposits are rare, and with the tin introduction, networks of trade and exchange appeared everywhere, through which traditions of using certain forms of tools could penetrate. As a result, the adoption of new tool designs occurred more quickly. However, for specific forms or design methods, like those seen in Seima-Turbino bronzes, migration must be considered. Proving this, though, requires detailed analysis (Chernykh and Kuzminykh 1989). However, in both cases we cannot draw conclusions about the language, we can only make assumptions that require additional evidence. In cases of seemingly illogical changes, such as the shift from tin to arsenic alloys in Southern Siberia during the transition from Andronovo to Karasuk metalworking, migration from a region where arsenic alloys were dominant is the most plausible explanation. In Europe, during the transition to the Late Bronze Age (LBA),¹ there was a return to antimony-arsenic alloys due to disruptions in tin supply (Grigoriev 2018). Thus, none of these facts can serve as direct evidence of ethnic change.

House-building traditions can be easily adopted by newcomers because they are often better suited to local climatic conditions. However, these traditions can also be linked to social processes, and certain skills and technologies may lead newcomers to preserve their own methods. It is important to remember that these building traditions are typically stable and have developed over centuries. When we observe the sudden appearance of something new, it may suggest the arrival of a new group. This is particularly evident in the case of Sintashta architecture, which stands out not only for the complexity of its layouts but also for the use of advanced technological skills and methods, carefully applied to different parts of the complex (Zdanovich *et al.* 2020, 2022). Therefore, explanations that attribute the round-plan fortified settlements of the Sintashta

¹ The following abbreviations are used in this book: EBA – Early Bronze Age, MBA – Middle Bronze Age, LBA – Late Bronze Age, IE – Indo-European, PIE – Proto-Indo-European.

culture to the steppe tradition of arranging carts in a circle for defense seem odd. These architectural features likely indicate the arrival of a new population, but not necessarily a change in language.

Thus, archaeology alone cannot answer questions about language. However, it can reveal the movement of cultural traditions through either borrowing or migration and can distinguish between these forms if analyzed comprehensively and correctly. Because archaeology relies on material evidence, it can estimate the proportion of alien traditions within different aspects of a new culture (such as ceramics, metal objects, burial rites, etc.). However, this does not necessarily reflect the proportions of the alien population. These proportions can vary significantly among different cultural aspects. Therefore, it would be misguided to use the appearance of a new cultural element as evidence of the spread of a new language.

Another important consideration when working with mass archaeological data related to migrations is that while we can understand general cultural trends and identify early and late features, reliably pinpointing specific stages of a culture is extremely rare. Usually, such attempts are extremely artificial and illusory, since slightly different traditions may coexist in neighboring areas. Throughout its existence, any culture undergoes various transformations due to various reasons, and these reasons may also differ even in neighboring areas. As a result, the general features of a culture typically reflect an abstraction rather than an actual state of any discrete period. These features represent a sum of characteristics from all stages of culture, from early to final. Nevertheless, we can qualitatively identify features that were likely introduced to a region, as they never existed there before. As a result, they cannot be counted statistically; we can study them only on a qualitative level. This approach is particularly relevant to the challenge of reconstructing the genetics of specific populations.

0.2.3. *Ethnic processes and genetics*

The advances in palaeogenetics have shattered the previously dominant belief in the autochthonous development of ancient cultures and showed large-scale migrations that took place in Eurasia in all eras. At the same time, these advances have created the illusion that geneticists, by simply presenting their data, can explain the formation of nations like magic. But the situation is not so simple, especially when relying on modern populations, as is the case in the Indo-Aryan problem. The challenge with genetics is that genes do not contain information about the language of their carriers. What we can observe is the movement of populations, not their linguistic identities. The genes of modern Hungarians are identical to those of the surrounding

Indo-Europeans, and the genes of Armenians, Georgians and Azerbaijanis, belonging to three different language families, are very close (Csányi *et al.* 2008; Schönberg *et al.* 2011: 992). In contrast, the North Caucasus shows a stronger correlation between genes and language (Balanovsky *et al.* 2011: 2911, 2915). We see the same problems in South Asia, where the Dravidian-speaking Brahui have the same genetic makeup as their Indo-Aryan neighbors, while the Iranian-speaking Hazaras show significant East Asian admixture (Pagani *et al.* 2015: 267, 268, 271, 275). In addition, an analysis of the distribution of haplogroups among groups of different ethnic or religious affiliations in modern India did not show a strict correlation (Mahal and Matsoukas 2018: 9). However, when analyzing the genes of early medieval Hungarians, their similarity to the Ural populations is revealed (Szeifert *et al.* 2018: 207). The problem with reconstructing the ethnic situation in India is that it is based on a series of analyzes of ancient populations of Iran, Turan and the steppe zone. One of the key issues in reconstructing the ethnic history of India is the lack of genetic data from ancient Indian populations. The analysis uses data on modern populations, as well as a large series of analyzes from cemeteries in the Swat valley in Northern Pakistan. However, these samples are dated to the late time span, between c. 1200 BC and AD 1700 (Narasimhan *et al.* 2019: 1, 2).

If we delve into additional details, the complexities increase. Very often, a certain ethnic group is associated with certain genetic markers. For example, the spread of Indo-Europeans is associated with Y-chromosomes R1a and R1b (passed through the male line), as these haplogroups dominate the modern European population. This has been attributed to the migration of the Yamnaya culture. However, the European population is more comparable to that of the Corded Ware culture, where the gene pool is dominated by the first haplogroup, and the predominance of the second is typical of the Yamnaya population. Furthermore, genetic distance maps for modern populations show a moderate similarity to Yamnaya genes only in Eastern Europe. It is also strange that these maps clearly show a gradient with an increase in this 'Yamnaya contribution' from the south to the north of Europe. There are other examples. Haplogroup G1 arose in the Near Eastern Highlands, but is now present among different ethnic groups, although its connection with individual clans or tribal groups is visible: among the Kazakhs-Argyn, among the Armenians-Hamshen, among the Bashkirs-Kangly. As a result, the haplogroup itself is not a marker of belonging to a specific ethnic group (Balanovsky 2015: 250-56). Broad generalizations are often made based on clusters identified through mitochondrial DNA (inherited through the female line), or autosomal markers, common for male and female representatives of the population. However, these findings can differ from those obtained from the study of Y-chromosomes.

For example, the Y-chromosome of haplogroup L1-M22 is obligatory for all representatives of the Caucasian-Iranian hunter-gatherer cluster from Transcaucasia to India, but it is absent in the steppe zone (with the exception of Maikop), despite the fact that half of the steppe gene pool was of southern origin (Pathak *et al.* 2024: 10). Clearly, this calls for more sophisticated analysis, and simple answers are not possible.

There is another problem. When establishing the relationships between populations, complex statistical procedures are used, but any statistics depend on the data being included. Usually a proposed model is checked with a corresponding set of compared material. The choice of this material is not always correct. For example, when modeling the origin of the genetic pool of the MBA/LBA transition east of the Urals, materials of the Globular Amphora Culture were used (Narasimhan *et al.* 2019: Table S 59), although these cultures are separated by a time span of almost 1000 years. Moreover, when geneticists use data from modern populations, they sometimes overlook the fact that current genetic profiles reflect not only the formation of these populations but also subsequent historical processes, which is obvious but often forgotten. It is similar to what we encounter in the analysis of archaeological materials. The genetic pool of a population reflects not only the genes responsible for its initial formation but also those from later processes. Imagine a situation where a standard procedure is used to model the formation of a population from two or three sources—say, sources 1, 2, and 3. In reality, however, the population formed from sources 1 and 4, and source 4 contained components from sources 2 or 3 due to earlier processes in a different region. It may also have contained a unique component, source 5, which has since been eroded over time. But we very rarely come across complexes from the very beginning of culture. This component may come into view and be perceived as an outlier. Subsequently, this population mixed with neighboring ones, which also had some proportions of the same genes, but different proportions. As a result, if we take the sample as a whole, then we are dealing with this complex and multi-temporal mixture.

Therefore, even genetic analysis cannot yet determine the exact proportions of primary genetic mixtures, although progress has been made in this area. However, these mixtures could vary significantly across different regions of the culture and during different periods of its existence. The limited materials available only allow us to make rough estimates of the general trends in gene distribution and the mixing of populations. Genetics is a reliable tool for studying migrations and is indispensable for reconstructing the spread of languages. As discussed earlier, for the spread of languages, a sufficient demographic base is essential, which is typically accompanied by a noticeable influx of new genes. But

it should be noticeable, what is sometimes ignored. For example, the presence of steppe gene admixture in two skeletons found in central Anatolia has led to the suggestion that the Hittites and Luwians originated from a ‘steppe homeland’, despite discrepancies with historical data (Lazaridis *et al.* 2024). This conclusion is clearly erroneous, and its methodological foundations are highly questionable. However, even if the influx of genes was substantial, it does not necessarily mean that a new language was adopted as well. Finally, in many regions of Eurasia, genetic samples have yet to be collected or analyzed. Naturally, geneticists recognize these issues and sometimes acknowledge the possibility of admixtures from unknown populations. However, this is not always considered. Therefore, genetics does not provide a direct answer to the question of the origin of a particular group of people, but its data should be taken into account. Unfortunately, genetic studies sometimes draw conclusions about language, which is entirely incorrect. Genetics addresses the history of a population’s formation, including migration to new regions, mixing with other populations, and the processes involved—but nothing beyond that.

0.2.4. Synthesis of data from linguistics, archaeology and genetics

First, it must be emphasized that the spread of languages is fundamentally a linguistic issue. Until the presence of a particular language in a certain territory is confirmed linguistically, it is difficult to draw confident conclusions about whether the emergence of a new culture or genetic influence transformed the linguistic landscape of the region. However, for preliterate periods, we are often forced to rely on indirect evidence. As shown in the examples above, no single field—archaeology, genetics, or linguistics—can solve this problem independently, as each discipline studies processes with distinct patterns and reflects different aspects of human life. However, we still have some grounds for reconstruction. In order for a language to establish itself, a demographic base is necessary, and this must be reflected in archaeological or genetic sources. The process of language adaptation is extremely slow. Therefore, even when the appearance of a qualitatively new culture and a noticeable influx of genes is clearly documented, we cannot assume that the entire population of this culture immediately adopted the introduced language, although this possibility cannot be excluded. However, without an abundance of written sources, we are unable to detect bilingualism or the limited use of the foreign language. The specific outcome depended on various factors in each case. A crucial factor, particularly in the Indo-Iranian context discussed here, is the linguistic proximity between the interacting languages. If they were similar, assimilation could have occurred more quickly, but this does not necessarily mean that the foreign language prevailed.

Nevertheless, the spread of language is impossible without migration, which can only be demonstrated through archaeological or palaeogenetic methods. At the same time, migrating cultures are usually transformed; the emergence of a new culture in a given region does not necessarily mean that a new language appeared alongside it, as new types of artifacts may also indicate that the region is being integrated into different social or economic processes. Similarly, the appearance of new genes does not confirm that a new language accompanied or became established with them. The solution is to build large and complex systems that integrate data from linguistics, archaeology, and genetics. In other words, we reconstruct the system of distribution and interaction of certain archaeological types, track the spread of genes, and compare this with linguistic data indicating the spread of language. If these three systems coincide, we can conclude that we have adequately understood the process of the emergence of a language. In my opinion, genetic and linguistic data are more ambiguous than archaeological data. Only archaeology can clearly show these processes with relatively precise references to time and place.

0.2.5. The problem of chronological data comparison

In order to compare these three systems—archaeology, linguistics, and genetics—we must work within a unified chronological framework, and here we encounter significant challenges. Archaeology and genetics rely on radiocarbon dating, while Near Eastern archaeology uses historical chronologies based on written sources. Ultimately, any linguistic chronologies are linked to written sources.

Linguistics employs well-known methods to determine the area where a language formed by reconstructing the natural environment, type of economy, contacts with other languages, and estimating the age of a language using glottochronology. This method uses a Swadesh list of 100 or 200 basic words, and it was once assumed that word replacement occurred at a constant rate, allowing for the calculation of when two related languages began to diverge. However, it is now widely understood that the rate of replacement varies significantly depending on social and other factors. Furthermore, it is important to remember that the vocabulary preserved in written sources may differ from the language used by the general population. However, written texts can also have their own specifics. They can be sacred and secular. Years ago, we worked in the Yezidi temple of Lalish in Iraqi Kurdistan. The Yezidis speak the Kurdish dialect of Kurmanji, but we were told that Kurmanji speakers from Transcaucasia often find it difficult to understand the dialect used in this temple. The sacred texts had remained unchanged for a very long time. Considering these and many other factors, along with the application of Bayesian modeling, has

led to a complete reassessment of the chronology of Indo-European languages and their disintegration from 7th–6th millennia BC has been suggested (Gray and Atkinson 2003; Heggarty *et al.* 2023). However, this remains an imprecise chronology, with extremely wide probability intervals. The use of the same method, but with some variations, showed the beginning of the divergence in the 4th millennium BC, and the separation of Indo-Iranian in 2100–1447 BC (mean 1763 BC) (Kassian *et al.* 2021). However, as it will be shown below, this does not correspond to archaeology. Also confusing is the parallel separation of Germanic, Italic and Celtic languages, as well as the separation of Insular Celtic in the range of 596 BC – AD 95, which seems too late. This happened around 900 BC (Koch 2020: 45).

There are no particular problems in comparing data from archaeology and genetics, since samples for genetic analysis are taken from a specific archaeological context. However, challenges arise when comparing data from distant regions, as all the information must fit into a single chronological framework. The main method for this is radiocarbon dating. However, this technique is not exact—it provides only probability intervals, and its results often differ significantly from historical chronologies based on written sources. These intervals also vary between older LSC (Liquid Scintillation Counting) dates and newer AMS (Accelerator Mass Spectrometry) dates. The first ones, as a rule, are somewhat older and much wider. For instance, the probabilistic interval for the Sintashta culture was previously estimated to be between 2200–1650 cal. BC (Chernykh 2007: 86). With the increased use of the AMS method and a large series of new dates, this range became 1960–1770 cal. BC (1σ , 68.2% probability) or 2040–1740 cal. BC (2σ , 95.4% probability). For the Abashevo culture of the Middle Volga with fewer dates, this difference increases: 2140–1870 cal. BC (1σ , 68.2% probability) and 2200–1650 cal. BC (2σ , 95.4% probability) (Epimakhov 2020: 55, 56). The difference in these intervals for individual samples is even greater, and the intervals are wider. Naturally, if we claim to use an exact method, we must use an interval calculated with a probability of 95.4%. It's crucial to understand that these are not precise dates for the existence of a culture or site but rather the probabilistic range within which its existence falls. The problem is aggravated by the fact that it is almost impossible to estimate the chronological position with intervals calculated with high probability; these intervals are too wide, so many people prefer a less reliable interval. Strictly speaking, the procedure for summing probabilities to determine these intervals is not meant to establish calendar dates but rather to compare two different intervals. At the same time, in non-specialized works, precise information is often not given about the method by which the date was obtained and how it was calculated. Consequently, dates such as 2200 or 2000 BC

are frequently repeated in the literature as the starting point for the Sintashta culture.

However, dates with more reliable intervals are likely to be older, as radiocarbon dates are often earlier than dates obtained from written sources, especially when they fall within a period where the calibration curve forms a 'plateau'. In particular, within the historical chronology, the beginning of the Sintashta culture is dated from the mid-18th century BC. Synchronizing the chronologies of the Eastern Mediterranean and China, as well as aligning both with dendrochronology, reveals their complete agreement. This means that these chronological systems are quite adequate, and radiocarbon ones give an earlier result. Only through the application of Bayesian statistics to a large series of AMS dates does one arrive at a result close to the Near Eastern chronology (Grigoriev 2023a, 2023b). However, the evaluation of the time depth of a particular language (excluding the numerous well-known issues with glottochronology) relies on historical chronology. Therefore, when we discuss the chronology of the Indo-Aryan language or Indo-Iranian cultures in the Near East, we are using one framework, while attempting to connect these with the archaeological cultures of the steppe zone requires a completely different one.

In the case of genetics, this issue is compounded because genetic analysis relies on the dating of individual bone samples. As a result, the probability intervals can be quite broad, although they can still be compared to archaeological chronology, particularly since the context of the samples is known. In this case, when using a more reliable but broader probability interval, and if the timing of genetic admixture is estimated based on the assumed rate of gene mutations—another probability interval—it becomes difficult to determine the exact age of population formation. Moreover, this genetic data may have no direct correlation with historical chronology. This is a complex issue that cannot be quickly resolved, but it is important to understand that it contributes to the mistaken belief that many phenomena appear first in the north, where they are carbon dated, and only then in the south, where they are associated with historical chronology. In this work, all dates are drawn from various sources, and it is essential to recognize their tentative nature. However, in future studies related to the Indo-Aryan question, historical chronology should take precedence.

0.3. Steppe hypothesis

Initially, the steppe hypothesis of the origin of the Indo-Iranian languages was based on the presence of corresponding (but primarily Iranian) toponyms and on the idea that the culture of the steppe Bronze Age matched the realities described in the Rig Veda or Avesta (metallurgy, handmade pottery, lack of crafts,

trade, writing and other signs of urban life). Significant importance was attached to the horse and chariot cults, with the spread of chariots southward thought to indicate the movement of the Aryans (Anthony 2007: 402, 403, 408, 416, 417, 427; Kuz'mina 2007: 173, 174, 185–91, 195). However, Iranian toponyms can be attributed to the later presence of Scythians and Sarmatians in the steppe. The Aryans of the Rig Veda were indeed unfamiliar with cities, only with small fortresses, but they were not exclusively herders, as they had some familiarity with agriculture (Bryant 2001: 186–91; Witzel 2001: 59–69), which already contradicts the steppe hypothesis. In addition, all these signs are characteristic of many cultures, including those in the Middle East. The burial of horses and chariots has been identified only in the Sintashta and Petrovka cemeteries and is absent in later Andronovo complexes, as well as in post-Harappan India. In northwestern India, the first evidence of horse remains dates to the first half of the 2nd millennium BC, while the earliest chariot discovery, found at Atranjikhra in the Upper Ganges basin, dates much later (between 350 and 50 BC) than the composition of the Rig Veda. From this, however, it does not follow that horses might not have existed earlier. They may have been rare and may have been imported, as was later being done in India, and they may not have been used in burials (Bryant 2001: 116–19, 170–77). Additionally, the Dravidian languages had their own word for 'horse', and the discovery of horse bones at Pirak c. 1700 BC may be associated with them rather than the Indo-Aryans (Witzel 1999: 32). Overall, the importance of the chariot and horse has been overly emphasized in Indo-European studies. At times, one gets the impression that horses themselves were thought to carry Indo-European dialects. These features cannot reliably indicate the presence of Indo-Aryans; otherwise, we would need to exclude the steppe Sargari and Fyodorovka cultures from consideration and instead consider some North Balkan cultures of the early 2nd millennium BC.

Frequently, other features of material culture, particularly Sintashta settlements, are used as evidence. The most comprehensive identification of Sintashta architecture with the Indo-Aryan tradition was recently conducted by G.B. Zdanovich in a publication on materials from the notable site of Arkaim. Comparisons with the Rig Veda texts were based on the work of T.Ya. Elizarenkova (1999), leading to conclusions about the architectural similarities between Arkaim and structures described in the Vedic hymns. Since the Sintashta dwellings were attached to each other and were built simultaneously, it is suggested that this explains why the Vedic word for 'house', *dám-*, is typically used in the plural, and why the verb associated with these dwellings is not 'to build' but 'to erect'. Moreover, the metaphor of 'house', used to designate a community and sometimes as something associated more with the gods than with

people, is mirrored in Arkaim, where ritual activity within the dwellings is thought to have occurred (though this has not been reliably confirmed). In addition to this, the very structure of the Sintashta fortified settlements resembles *Mandala* and *pūr*-, fortresses described in the Rig Veda. This connection is based on a quote from W. Rau: ‘Wherever we hear that one person is at the same time in many *purs*, we must conclude that the latter were built concentrically, either according to the plan of a polygon, or a circle or an ellipse’, a description that matches the layout of the Sintashta settlements, which are encircled by multiple concentric walls. Added here is the identification of the Sintashta wells with the celestial waters of the Rig Veda and the epithet *cāradi* (‘autumn’) used for the fortress, which Rau considered as evidence of the seasonality of these fortresses and the fact that they had to be repaired every autumn after seasonal rains that destroyed clay (an important building material of the Rig Veda and Sintashta settlements). Many additional details contribute to an impression of striking similarity² (Zdanovich *et al.* 2020: 441-49; Zdanovich *et al.* 2022: 354-71).

In reality, this reflects an inaccurate understanding of the Rig Veda, which is filled with metaphors, epithets, and ambiguities, as these liturgical texts were not created for human comprehension but were intended for the gods. T.Ya. Elizarenkova demonstrated that the concept of *dām* is more complex and often represents an abstract idea rather than a specific building. From all the texts of the Rig Veda it is impossible to extract information about what an Aryan house looked like. There is only one word *dvar*-/dur- ‘door’, ‘gate’, indicating the presence of this part of the house. All comparisons with Sintashta dwellings or Andronovo semi-dugouts are too far-fetched. The fortresses described as *pūr*- do refer to real structures, but there is no mention of the Aryans coming out of them. Instead, they are depicted as entering these fortresses during assaults, and many *purs* are described as being destroyed by Indra. Therefore, these fortresses belonged to the rivals of the Aryans, *dāsa*/*dasyu*, and the Aryans had no fortresses at all. Even this term is frequently used metaphorically to denote protection or a spiritual stronghold and is sometimes identified with God, akin to Christian symbolism. Therefore, this often acts as a metaphor for protection, and being in several *purs* at the same time has a metaphorical meaning, but does not reflect reality. At the same time, it is recognized that the plans of the Sintashta settlements indeed fit these descriptions. Additionally, the location of the Arkaim cemetery to the south of the settlement corresponds closely to Aryan traditions (Elizarenkova 1999: 197-230). In fact, the Bolshekaragansky cemetery is located north of Arkaim, but precise correspondences

or inconsistencies are less significant here, as we are dealing with epithets and metaphors. It is also important that these fortresses did not belong to the Aryans, and real descriptions do not allow us to make comparisons with archaeological materials at all. Likewise, from the rare epithet ‘autumn’ one cannot draw all subsequent conclusions about seasonal use and repairs after rains. This epithet allows us to make a wide variety of interpretations. Consequently, all comparisons between Bronze Age steppe communities and Rigvedic societies lack sufficient evidence. As Elizarenkova notes: ‘The RV is the only source that has come down to us from this time. The only one, but not historical. And we must always remember this when using the hymns of the Rig Veda.’ (Elizarenkova 1999: 196).

One of the common reasons for associating the Indo-Iranians with the steppe is the assertion that they were primarily pastoralists with little to no familiarity with agriculture, a characteristic that closely aligns with the lifestyles of the Sintashta and Andronovo cultures, as well as the Rig Veda and Avesta (Anthony 2007: 304, 439; or limited knowledge of agriculture: Kuz'mina 2007: 165). Indeed, there is currently no evidence that the Sintashta-Alakul people practiced agriculture. However, the case for Indo-Iranian agriculture is less straightforward. A study of Indo-Iranian vocabulary reveals that while pastoral terminology was inherited from Proto-Indo-European, agricultural terminology varies between Iranian and Indian languages. Some agricultural terms are derived from Proto-Indo-European, but many show irregular correspondences across Indo-Iranian languages. Inherited terms going back to Proto-Indo-European include words for cultivated field, cultivated plants, grain and barley. The word for ‘wheat’ is a loanword with parallels in Hittite. Although there is no single term for ‘plow’ or its parts, a shared Indo-Iranian word for ‘ploughshare’³ can be reconstructed. It is concluded that this situation ‘speaks for a mainly pastoralist rather than agricultural economy at the time of Proto-Indo-Iranian’ (Kümmel 2017). It is important to note that agriculture is not entirely excluded. The borrowing of a term for ‘wheat’ with Hittite parallels can be explained by contact with the BMAC. It is significant that this word has the same origin in Avestan and Vedic, and can be dated to the Proto-Indo-Iranian stage. The source of the borrowing appears to be a Proto-Kartvelian term (Witzel 2015), which may point to an Indo-Iranian homeland near the Kartvelian-speaking regions.

² Some features of Aryan architecture are ignored in this comparison, in particular the fact that the Aryans used bamboo.

³ It cannot be ruled out that the word for ‘ploughshare’ was borrowed at the stage of common Indo-Iranian, since it has features of a non-Indo-European word (Lubotsky 2001: 307). But it is strange to expect the appearance of this borrowing in steppe Eurasia. It could only happen in the south. Therefore, either we must localize the Indo-Iranian homeland in the south, or we must date the split of Indo-Iranian to the time of the hypothetical migration of the Andronovo people to the south.

However, the presence of terms for 'cultivated field', 'cultivated plants', 'grain', 'barley', and 'ploughshare' indicates agricultural knowledge, which does not align with the environment of steppe Eurasia. Instead, this limited agricultural vocabulary corresponds well to the peripheral regions of Central Asia's agricultural civilizations, such as the Sapalli culture, where barley, wheat, millet, and flax were cultivated. While a depiction of a plow exists in Bactria, no such evidence has been found in Sapalli, though a bronze model of a ploughshare was discovered at Dzharkutan (Vinogradova 2004: 65-66). This evidence also accounts for the term 'field'. Thus, rather than supporting a steppe homeland, this set of agricultural terms points toward the peripheral areas of southern agricultural civilizations. Later, we will discuss the limited agricultural vocabulary in Dravidian, which borrowed numerous terms from the original populations of Hindustan, as well as Dravidian borrowings in Finno-Ugric. These facts suggest migration through the arid regions of Iran, not a steppe homeland for the Dravidians.

This does not mean that the Indo-Iranians did not inhabit in the steppe. Their presence is indicated by lexical borrowings in Finno-Ugric languages, though these borrowings could also have arisen through migration from the south. Therefore, archaeological data on the nature of cultural development in this area are fundamentally important, and the Steppe hypothesis faces many challenges in this regard.

In Indo-Aryan studies, it is generally accepted that the Eneolithic of the steppe zone and the subsequent Early Bronze Age (EBA) cultures, such as the Yamnaya, as well as the Middle Bronze Age (MBA) cultures, including Catacomb, Abashevo, and Poltavka, were Indo-European. The MBA cultures are thought to have developed from the Yamnaya and to have formed the foundation for the Sintashta culture in the Transurals, which combines Abashevo and Poltavka elements in ceramic ornamentation and metalworking (Anthony 2007: 62-66, 275-77, 306, 382; Parpola 2017: 278; 2020: 188). Since Poltavka complexes have not been found in the Transurals, it is assumed that burials 11, 19, 28, and 39 from the SM complex of the Sintashta cemetery, dated to 2800/2700-1900/1800 BC, reflect a Poltavka presence (Anthony 2007: 374, Table 15.1). However, these are actually classical Sintashta burials with incorrect dates (Gening *et al.* 1992: 155-61, 228-34). No Poltavka influence on Sintashta has been observed, although some ceramic types are shared with Abashevo. This similarity is better explained by mutual contacts and influences between the two cultures.

However, Eastern European influences cannot fully explain the distinct architecture and funeral rites of the Sintashta culture, which show Near Eastern parallels. This rapid development is therefore attributed to trade

contacts with the Bactro-Margianan Archaeological Complex (BMAC). Since neither the BMAC nor the Sintashta culture contains significant inclusions from the other, these contacts are inferred from rare finds of lead in both cultural groups, suggesting its export from the BMAC area. Even finds of horses in Iran in 2100-2000 BC, as well as in Ur III, are interpreted as a sign of these trade relations. Even direct campaigns of the Sintashta people into Mesopotamia are assumed, which could help the Elamites to crush Ur, at the same time spreading chariots in the Near East (Anthony 2007: 391, 412, 413, 416, 417, 427, 433-35). However, lead was not a traded commodity in ancient times; rather, it was a by-product of smelting lead ore to produce silver. In the Sintashta culture, two slag finds with traces of metallic lead reflect this process (Grigoriev 2015: 164, 165). In studies of these connections, the historical chronology (2111-2003 BC) was applied to the Third Dynasty of Ur, while an outdated radiocarbon chronology was used for Sintashta. Currently, in radiocarbon chronology, Sintashta is dated to 2040-1740 cal. BC, and in historical chronology from the mid-18th century BC. Horses were kept for crossing with donkeys in Mesopotamia long before the emergence of the Sintashta culture, chariots have an earlier date in the Middle East, and they were developed there (Grigoriev 2023c). In addition, this model assumes a very early movement of the Sintashta people to the south, but there are no Sintashta materials there. The only site on which the supporters of this hypothesis rely is Tugai on the Zeravshan (Avanesova 2015). In fact, this complex does not contain any Sintashta features; it has Alakul pottery, although quite early, dated to the Sintashta period. The hypothesis posits that steppe chariots predate those in the Near East (before 2000 BC in the steppe and from 1800 BC in the Near East). Thus, the discovery of cheek-pieces in the tomb of Zardcha Chalifa on the Zeravshan is thought to signify the arrival of the Sintashta-Petrovka complex in the south (Anthony 2007: 402, 403, 431; Kuz'mina 2007: 323, 230, 333). But the problem here is the same: for the Near Eastern chariots, historical chronology was used, and for the steppe chariots, radiocarbon chronology in an outdated form. Furthermore, Zardcha Chalifa is a typical BMAC complex, lacking steppe characteristics (Bobomulloev 1993; Grigoriev 2023c).

As a result, later Andronovo penetrations are discussed further. The argument is put forward that Sintashta formed the basis for the entire Late Bronze Age (LBA) culture of the steppe. From Sintashta, the early Srubnaya Pokrovsk culture developed in Eastern Europe, while in the Asian steppe, the Petrovka culture emerged, followed by the Alakul and subsequently the Fyodorovka cultures. This sequence is thought to culminate in the formation of a Cordoned Ware horizon across the steppe. But it is necessary to pay attention to the nuances. E.E. Kuz'mina, for instance, avoided directly asserting that the Fyodorovka culture emerged

from the Alakul culture. Instead, she mentions that the Fyodorovka culture was formed in the east and closely interacted with Alakul, yet she notes that it featured cremation practices and was created by Indo-Aryans (Anthony 2007: 410, 437, 441, 448; Kuz'mina 2007: 180, 185-90, 234, 237). This is explained by the fact that all her life she rightly defended two independent lines in the development of Andronovo cultures: Sintashta-Petrovka-Alakul and Fyodorovka. As we will explore further, not all experts have supported a unified sequence of Andronovo cultures (Sintashta-Petrovka-Alakul-Fyodorovka), and today, there are few remaining advocates of this perspective on Andronovo cultural development. Instead, a related cultural grouping can be identified: Sintashta, Petrovka, and Alakul. The Fyodorovka culture, however, emerged further east and is not directly connected to this group. Furthermore, the cemetery near the village of Andronovo in the Minusinsk Basin contained ceramics of the Fyodorovka type, yet no Alakul ceramics have been found in Southern Siberia. Consequently, Siberian archaeologists traditionally use the term 'Andronovo'. In contrast, specialists in the west (Central Kazakhstan and particularly the Transurals) refrain from using this term due to the ambiguity around whether the materials referenced pertain to Alakul or Fyodorovka.

The term 'Andronovo culture' is generally inaccurate, as it can strictly be applied only to Fyodorovka sites. Applying it to Alakul sites is already questionable, and using it for Petrovka or the later Sargari sites is outright incorrect (Grigoriev 2021b). But the difficulty is that the monuments in the south, in Uzbekistan and Tajikistan, belong mainly to the Fyodorovka line of development, and they are present mainly in mountainous areas (Kuz'mina 2007: 241-49, 267, 283, 285). This creates an illogical connection: the Alakul culture is genetically related to the Sintashta culture through typology, and because the Sintashta culture is classified as Indo-Aryan based on funeral rites, the Alakul people—who did not practice these rites—are also categorized as Indo-Aryan. But the Fyodorovka people became Indo-Aryans on the basis of a completely contrasting funeral rite, characteristic of neither the Sintashta nor Alakul people. These different processes are combined into one solely on the basis of the reconstruction that they were all Indo-Aryans. As a result, it is common to avoid discussing Alakul or Fyodorovka migrations individually, and instead to refer broadly to 'Andronovo migration'. This preference is unlikely to be coincidental. It is also worth noting that in southern regions, nearly all materials can be traced back to the Fyodorovka culture, with minimal influence from Sintashta culture.

It is assumed that Indo-Iranian migration to the south first manifested in the Tazabagyab culture on the Syr Darya River (Figure 1). Some scholars consider it a variant of the Andronovo culture (Mallory and Adams

1997: 566; Anthony 2007: 452), while others see it as formed from Andronovo and Srubnaya traditions (Kuz'mina 2007: 239). In fact, there is no solid basis to classify Tazabagyab as Andronovo. It appears difficult to identify any direct Andronovo influence in it, although the researcher of this culture admitted this possibility, nevertheless insisting on its local Central Asian⁴ roots (Itina 1977: 111, 119, 176). Although small Andronovo sites exist in the Kyzylkum Desert, their influence was not decisive. Farther south, they encountered the Bactro-Margianan Archaeological Complex (BMAC), where no confirmed Andronovo traits appear. Those features described as 'Andronovo' do not warrant serious scholarly critique.

Therefore, it is assumed that migrants mixed with BMAC people, borrowed their culture, spread their language, and then move further south with the BMAC culture. This is known as the *Kulturkugel* model, likening the Andronovo culture and Indo-Aryan language to a 'bullet' passing through the BMAC 'obstacle', emerging transformed with a BMAC cultural identity and Indo-Aryan language (Mallory 1989: 192; Mallory 2001: 361; Carpelan and Parpola 2001: 137; Anthony 2007: 428, 431, 433, 435; Parpola 2017: 274).

E.E. Kuz'mina strongly opposed this model. Her Indo-Iranian affiliation of the Andronovo people relied on the supposed similarity to Vedic culture and contrast with southern agricultural cultures, including the BMAC. Therefore, she preferred to look for traces of the Andronovo people, calling even the bearers of the Cordoned Ware cultures 'late Andronovo people'. In Tajikistan, traces of Andronovo influence exist, as the Sapalli culture (a local BMAC variant) includes some Andronovo pottery. However, farther south in Tajikistan, Andronovo influence is claimed based mainly on a few cremation burials and a swastika-shaped stone layout in the Beshkent-Vakhsh culture (Kuz'mina 2007: 171-75, 270, 276-82, 323, 325). In reality, opportunities to identify genuine steppe features in these southern regions are minimal. In the Dashli oasis and possibly Shortugai, only a few fragments have been found, dating to around 2200-2000 BC, which raises doubts.

At Juderjo Daro in Pakistan, several plain sherds were labelled Andronovo solely because they were handmade, determined from photographs. Later, during the Final

⁴ Difficulties arise from the fact that different languages—and sometimes even different publications within the same language—employ varying names for large regions. In this work, 'Central Asia' refers to southern Kazakhstan, Uzbekistan, Tajikistan, and Turkmenistan. Elsewhere, this term is sometimes applied to Mongolia and its surrounding areas. To prevent misunderstanding, the term 'Inner Asia' is employed here for those regions. Similarly, some literature uses the term 'Middle East' for regions such as Syria, which another source may instead classify under the 'Near East'. In this work, 'Near East' is applied to the western regions, while 'Middle East' may be used to designate a broader area, including Iran.

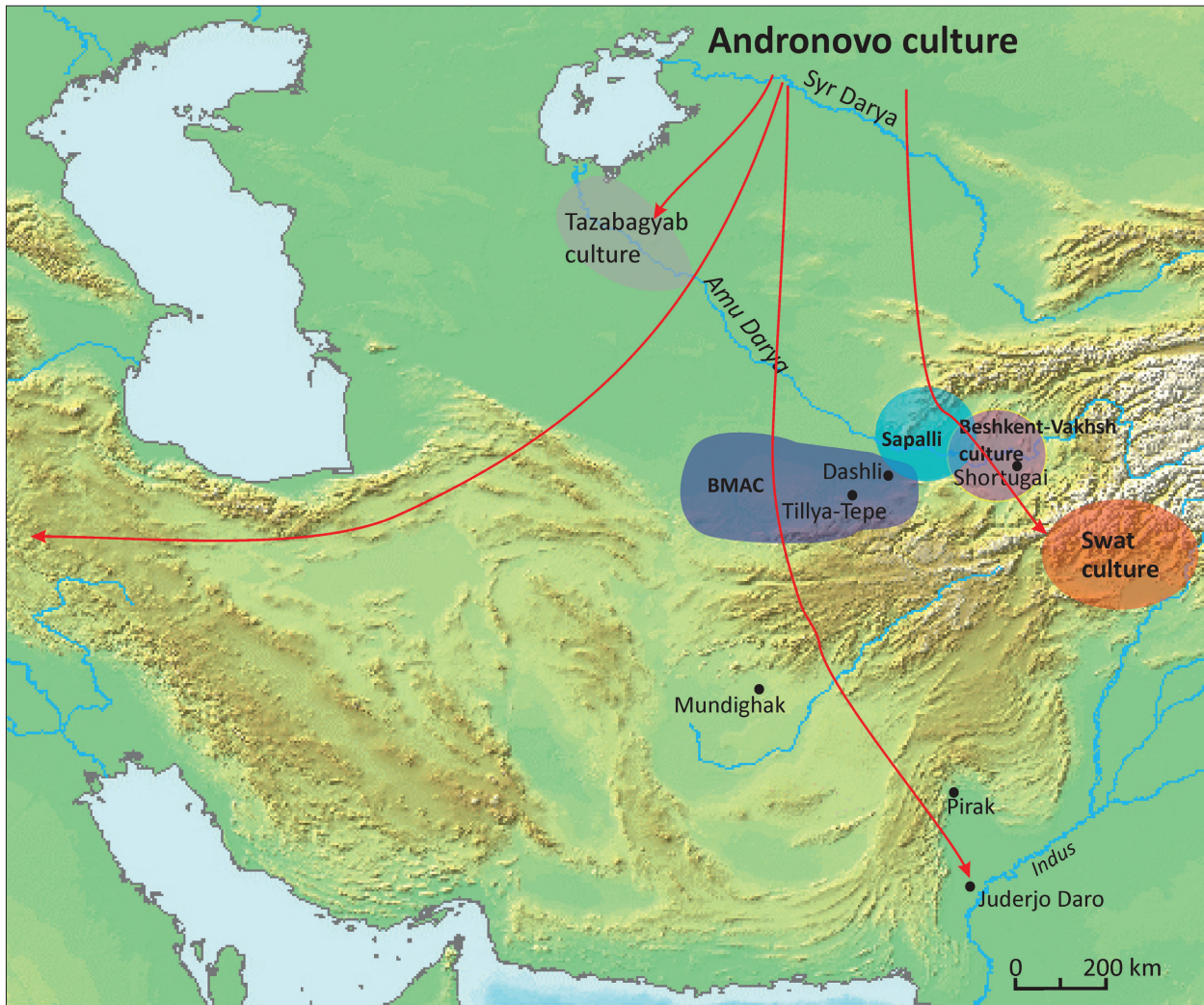


Figure 1. Map of Indo-Aryan migrations according to the Steppe hypothesis.

Bronze Age, alleged steppe migrations are inferred from a handful of cordoned-ware fragments found at Shortugai (Uzbekistan), Tillya Tepe, Mundighak (period VI), and Pirak (period II) in Afghanistan (Kuz'mina 2007: 327, 286, 287, Figures 50.54-57, 91.23-28, 99, 101, 103, 105). Yet cordoned ceramics and handmade ware were also present locally in the south, and their forms at Shortugai and Mundighak are entirely local. Finding parallels in India is unrealistic. Consequently, some suggest that interactions between Andronovo and Beshkent populations led to the formation of the Gandhara (Swat) culture in northern Pakistan, although no specific 'Andronovo' features are identified.

Therefore, it is assumed that the Aryans in India were constantly on the move, lived in carts and left no archaeological traces. They used local pottery, and did their own ceramics only for religious purposes (Kuz'mina 2007: 170, 326). For the Gandhara culture, a connection with the Sintashta and Petrovka cultures was also proposed, but also not on the basis of specific cultural traits, but on the basis of the presence of

horses there (Parpola 2020: 191, 192). Should we attribute all cultural complexes with horses from the 2nd millennium BC to the Petrovka culture? Supporters of a steppe homeland for the Indo-Aryans acknowledge that there are no definite Andronovo elements farther south. The distribution limit of genuine Andronovo or Sargari materials lies in Kyzylkum and northern Tajikistan, where remains are primarily from the Fyodorovka culture—unrelated to the Sintashta-derived sequence. The Indo-Aryan affiliation of Fyodorovka is justified solely by the presence of cremation. Although the Rig Veda mentions cremation and its introduction into India is often linked to the late Harappan cemetery H. In the cemetery's lower layer, bodies were buried in an extended position, reflecting a typical Harappan practice. In the upper layer, however, the remains were placed in vessels. Furthermore, the remains in these vessels were disarticulated, and some were burnt, indicating cremation (Sarkar 1964). However, cremation during the Bronze Age was widespread across many cultures and cannot be considered unique to the Fyodorovka culture or specifically Indo-Aryan.

In addition, the combination of placing both cremated remains and disarticulated bones in vessels is not characteristic of the Fyodorovka culture.

Therefore, it would be more productive to refrain from further discussion of this issue until concrete evidence, rather than hypothetical scenarios, can be presented.

One hypothesis suggests that the Andronovo people entered India and adopted the BMAC culture. This idea is supported by the presence of arsenic copper in northern Indian hoards. It is postulated that such copper was characteristic of the Sintashta culture; it is not found in Harappa. It is therefore assumed that these populations passed through the BMAC in accordance with the *Kulturkugel* model, and then in the process of the BMAC's southward expansion they penetrated the Indian subcontinent, retaining only the arsenic alloying tradition (Parpola 2020: 182, 183). However, no BMAC materials have been found in northwestern India. Furthermore, the northern boundary of the BMAC lies thousands of kilometers from Sintashta sites, and the later Alakul and Fyodorovka complexes are associated with tin alloying rather than arsenic. Thus, according to this scenario, these migrants would have needed to begin transforming their culture into a BMAC form long before entering Central Asia, preserving only select technological skills. This scenario no longer aligns with the original *Kulturkugel* model. Instead, it resembles what could be termed a '*Zauberkulturkugel*'⁵, wherein the metaphorical 'bullet' alters its form even before reaching its target, maintaining only language and certain technological aspects, and changing direction as well. Additionally, arsenic alloys have been documented in Harappa (see below).

Thus, from a typological perspective, the hypothesis suggesting the arrival of the Indo-Aryans from the steppe does not withstand even the most elementary scrutiny. In addition to the complete absence of comparable materials in southern Central Asia and northern India, it also fails to align with current understanding of Andronovo cultural development. Even if we momentarily assume that migrations could occur without leaving any archaeological evidence, one might ask whether this theory finds support in the system of dialectal language divisions or linguistic connections. The answer is no. All that exists are assumptions that certain cultures corresponded to particular languages, without any serious attempt at rigorous justification.

Below, we will examine the relatively early separation of Indo-Iranians from other Indo-Europeans. However, the steppe hypothesis, in the absence of adequate linguistic justification, proposes a later timeline

for these developments. It is assumed that this separation began during the Yamnaya period in the 3rd millennium BC, and by the Catacomb period (2500–2200 BC), steppe populations were already speaking a Proto-Indo-Iranian language (Anthony 2007: 82; Parpola 2017: 245). Identifying the exact cultural groups who spoke this language is more complex. The Poltavka, KMK (Babino), and Abashevo cultures have all been proposed as candidates (Kuz'mina 2007: 168). At times, the Abashevo culture was considered Indo-Aryan, while the Catacomb and Srubnaya cultures were viewed as Proto-Iranian. Concurrently, the Andronovo population was regarded as Indo-Aryan. This reasoning was used to explain borrowings from the Abashevo Indo-Aryan language into Finno-Ugric languages, which appeared to align with the notion that the Sintashta culture was formed on an Abashevo foundation (Carpelan and Parpola 2001: 133; Parpola 2017: 245, 252–54, 278). However, the Abashevo and Babino cultures originated from migrations starting in Central Europe (Lytvynenko 2013; Mimokhod 2018a). Furthermore, the Sintashta culture served not only as the foundation for the Alakul culture but also, to a large extent, for the Srubnaya culture. As a result, the Proto-Indo-Iranian stage has been linked to the Sintashta and Potapovka cultures and, in some cases, to Abashevo (Anthony 2001: 24; Parpola 2020: 190). Thus, according to radiocarbon chronology, the Indo-Iranian stage is dated to the 20th–18th centuries BC, while historical chronology places it from the mid-18th to 17th centuries BC. Later identifications are inconsistent. Considering that the Finno-Ugric homeland is located in the forested Transurals and Western Siberia, and that the Proto-Finno-Ugrians were in contact with the Proto-Indo-Aryans (see below), while no cultures in the forest-steppe Transurals prior to Sintashta can be connected to the Eastern European steppe, researchers have been compelled to consider the Sintashta culture as Proto-Indo-Iranian.

It is generally agreed that the Indo-Aryans moved south first, followed by the Iranians in a subsequent wave (Mallory and Adams 1997: 309; Lubotsky 2001: 308). Some texts suggest that the Srubnaya people were ancestors of the Scythians and that the Andronovo population spoke a range of Indo-Iranian dialects (Kuz'mina 2007: 167). Others directly identify the Srubnaya with the Proto-Iranians and the Andronovo with the Proto-Indo-Aryans (Parpola 2020: 190). However, in some interpretations, the southward movement of the Andronovo people is associated with Indo-Iranian migrations, with their language only transforming into Indo-Aryan upon entering the BMAC region around 1900 BC. For those who remained in the steppe, the language is said to have evolved into Iranian (Anthony 2001: 26; Anthony 2007: 435, 450). According to the chronology, this transformation would have occurred during the Sintashta period. However, how can

⁵ Magical cultural bullet (German).

one account for Indo-Aryan borrowings in Finno-Ugric if this language originated in southern Central Asia? In addition, does this imply that all the tribes derived from this northern substrate (Srubnaya and Alakul) eventually adopted Iranian? Furthermore, how should one address the complete absence of Sintashta finds in the south? If this transformation occurred during the Andronovo period, then it should have been quite rapid, since soon Mitannian Indo-Aryan was already recorded in the Near East. This migration of future Mitannian Aryans from Central Asia through northern Iran around 1600-1500 BC is evidenced by the appearance of ceramics in the Near East that show parallels with those in north-eastern Iran (Harmatta 1992: 364-65; Mallory and Adams 1997: 309; Anthony 2007: 454; Parpola 2020: 191). However, this leads to the same problem: there are no genuine Sintashta or Andronovo characteristics identifiable in Iran. Given this fact, why not consider the possibility that Indo-Aryans migrated into the Near East from Iran rather than from the steppe? More importantly, what transpires later in the steppe zone, where the Iranian groups are believed to have formed, warrants closer attention.

This issue is related to the presence of Scythians and Sarmatians in the steppe during the 1st millennium BC, peoples who spoke languages belonging to the Eastern Iranian group. As a result, earlier scholars proposed that the Andronovo population were northeastern Iranians (Diakonoff 1990: 58). Additionally, the southward spread of the Cordoned Ware cultures has been associated with the second wave of migration by Iranian groups (Parpola 2017: 271, 275). According to one explanation, the emergence of the Iranians can be traced through the transformation of the Andronovo and Srubnaya cultures into Final Bronze Age cultures, which subsequently evolved through the Chernogorovka and Novocherkassk phases, leading ultimately to the Scythians. This view is supposedly supported by references indicating that V.Yu. Murzin established such a connection (Kuz'mina 2007: 169, 366, 383-86, 390-95, 411). In fact, Murzin's findings indicate the opposite, pointing to local origins in early Scythian ceramics and two eastward impulses from Inner Asia: one initiating the Chernogorovka complex in the 10th century BC, and another leading to the development of the Proto-Scythian complex in the 7th century BC. Furthermore, there are no Scythian elements present in the Novocherkassk complex (Murzin 1990: 16-31). A similar situation occurred in the Asian steppe, where no direct cultural continuity can be identified between these periods. Instead, the formation of Early Iron Age cultures throughout the region is attributed to migrations originating in Inner Asia.

Even if we assume otherwise, then during the Late Bronze Age (LBA) in the steppe zone, Iranian groups would have formed relatively rapidly, and by the 7th-

6th centuries BC, their language should have evolved into a North-Eastern Iranian form. Consequently, the split between Eastern and Western Iranian must have taken place earlier, in the late 2nd to early 1st millennium BC. How did the split into Western and Eastern Iranian branches occur, and how did speakers of both variants appear in Iran by the time the Avesta was composed, while populations speaking Eastern Iranian remained in the steppe? Should we therefore consider two separate migrations into Iran? This is precisely how some researchers attempt to model it. It is widely believed that these groups migrated into western Iran from the Eastern European steppes via the Caucasus. However, for the Eastern Iranians, an alternative route along the opposite coast of the Caspian Sea has been proposed (e.g. Girshman 1981: 142). Meanwhile, the article by I. Aliev and M.N. Pogrebova (1981: 128) is frequently cited in support of these interpretations. It states: 'The characteristic features of the Steppe mounds in Azerbaijan are various wooden structures, traces of fire and especially the ritual of horse burials [86, p. 41, 370; 57; 59; 60; 46; 47; 5]. This ritual, which has no origins in the cultures of Transcaucasia and Iran of earlier times, most likely should be associated with the world of the southern Russian steppes. ... All this allows us to assert that the horse burials of the late 2nd – early 1st millennium BC in the North Caucasus, Azerbaijan and Northwestern Iran record the path of the first Iranian-speaking immigrants moving from the southern Russian steppes to Western Asia through the Caucasus'. However, the cited literature provides no information regarding comparable burials from this or earlier periods, and they are separated from the Sintashta-Petrovka horse burials by a substantial chronological gap. Furthermore, in eastern Transcaucasia and Iran, no other materials resemble those found in the northern Eurasian steppe.

From the available archaeological evidence, it is entirely impossible to reconstruct how this process may have occurred. Incorporating the linguistic chronology of the Avesta and Rig Veda introduces a number of additional, challenging questions. As a result, establishing a coherent model for the dialectal divisions of Indo-Iranian languages remains entirely unattainable.

Thus, the hypothesis proposing a steppe origin for the Indo-Iranians is inconsistent with: (1) the pattern of cultural development in the steppe during the Bronze Age and Early Iron Age; (2) the model of dialectal division among Indo-Iranian languages; and (3) the complete absence of steppe materials, not only in Iran and India, but even in regions adjacent to them. Furthermore, it is internally contradictory. Its prolonged acceptance may be explained by the absence of critical scrutiny, much like the scenario realized by the child in Andersen's fairy tale about the Naked King. Notably, all Russian

archaeologists are well aware that Andronovo materials are absent in the south, yet most remain convinced of this southward migration. Some Western researchers have repeatedly criticised the steppe migration hypothesis, particularly the *Kulturkugel* model, and have noted the absence of Andronovo sites in the south (Frankfort 2001: 153, 154; Bryant 2001: 205, 207, 208, 217; Lamberg-Karlovsky 2005: 155, 168, 169). These findings are not obscure. What is surprising is that even in the works of linguists—whose own research suggests an entirely different conclusion, as we will see below—adherence to the steppe homeland hypothesis still

emerges (e.g. Blažek 2002: 220-26; Witzel 2003: 5, 48, 52-56). A similar situation arises in palaeogenetics, where study results indicate that the population of the Indian subcontinent formed from neighboring substrates, yet the conclusions still incorporate the steppe homeland hypothesis (Narasimhan *et al.* 2019). This notion may have delayed a successful resolution of the problem for many decades. It is necessary to establish a framework in which archaeological, palaeogenetic, and linguistic data do not contradict one another, as occurs with the Steppe theory. Since this is primarily a linguistic problem, the starting point should be language.