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Research on the Structure of Indo-European Dialect Continuum by Comparing Swadesh Lists of the Closest Descendant Languages

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Introduction. This article is an attempt to extract information about the interactions of dialects of the Indo-European dialect continuum with each other using a comparative analysis of the basic vocabularies of some Indo-European (IE) descendant languages.
The search for external borrowings and influence of a common substrate would help to clarify the ethno-linguistic surrounding of the area where the IE proto-dialects developed.
In turn, these data are actual being pro and contra arguments of the well-known hypotheses about the IE ancestral home.
Methodology and sources. The number of mutually understandable basic lexemes taken in relation to the number of lexemes in the compared lists was chosen as a measure of the interaction of IE dialects, indicators of their commonality.
207-word Swadesh lists of 12 languages in their possibly more ancient states were analysed. For geographical binding of the IE language areal we have selected cross-borrowings from/to neighboring / substrate non-IE languages, the ancient settlement areas of native speakers of which are considered well-known.
Results and discussion. The results of the comparison of the basic vocabularies of 12 IE languages have been interpreted in the form of a graph demonstrating the relative location of areas of the corresponding IE dialects. Lexemes meaning 'predator (bear, lion, etc.)', 'cattle (bull, ox)' determined the ethno-linguistic surrounding of the IE areal.
Conclusion. The relevant linguistic data permitted to identify in the IE dialect continuum the core of proto-dialects: Baltic, Slavic, Aryan and Italic – and partially superimposed dialect subcontinua:

- Balto-Greco-Aryo-Tocharo-Anatolian subcontinuum in the northern part of the IE areal;
- Tocharo-Celto-Germanic subcontinuum in the eastern part;
- Germano-Celto-Italo-Greco-Armeno-Baltic subcontinuum in the southern part;
- Balto-Slavo-Italo-Aryan subcontinuum in the western part.

The representation of the Proto-IE areal as a dialect continuum solves a number of difficulties inherent in the most common model of a single IE proto-language.

Keywords: Indo-European, Uralic, Altaic, Semitic, adstrate, substrate, languages, dialects, Anatolians, Illyrians, Thracians, Armenians, Celts, Germans, Balts, Slavs, Italic people

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Оригинальная статья

Исследование структуры индоевропейского диалектного континуума с помощью сравнения списков Сводеша ближайших языков-потомков

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Введение. Статья является попыткой извлечения информации о взаимодействиях диалектов индоевропейского диалектного континуума друг с другом с помощью сравнительного анализа базовых лексиконов ряда индоевропейских (ИЕ) языков-потомков. Поиск внешних заимствований и влияний общего субстрата помог бы уточнить этноязыковое окружение области развития ИЕ протодиалектов. В свою очередь, эти данные актуальны как аргументы pro и contra известных гипотез об ИЕ прародине.

Методология и источники. В качестве меры взаимодействия ИЕ диалектов, показателей их общности выбраны количества взаимно понятных базовых лексем, взятые в отношении к количествам лексем в сравниваемых списках. Анализу подверглись 207-словные списки Сводеша двенадцати ИЕ языков в их возможно более древних состояниях. Для географической привязки ареала носителей ИЕ праязыка исследовались перекрестные заимствования из/в соседние и/или субстратные не-ИЕ языки, древние ареалы носителей которых считаются достаточно хорошо известными.

Результаты и обсуждение. Результаты сравнения базовых лексиконов двенадцати ИЕ языков интерпретированы в виде графа, отображающего относительное расположение ареалов соответствующих ИЕ диалектов. Лексемы со значениями 'хищник (медведь, лев и т. п.)', 'скот (бык, вол)' определили этноязыковое окружение ИЕ ареала.

Заключение. Выбранные лингвистические данные позволили выделить из ИЕ диалектного континуума ядро из четырех протодиалектов: балтский, славянский, арийский и италийский – и четыре переходящих друг в друга субконтинуума:

– балто-греко-арийско-анатолийско-тохарский – в северной части ИЕ ареала;
– тохарско-кельтско-германский – в восточной части;
– германо-кельтско-армянско-италийско-балтский – в южной части;
– балто-славяно-италийско-арийский – в западной части.

Представление праиндоевропейского ареала в виде диалектного континуума разрешает ряд трудностей, присущих модели изначально единого праязыка.

Ключевые слова: индоевропейские, уральские, алтайские, семитские, адстратный, субстратный, языки, диалекты, анатолийцы, иллирийцы, фракийцы, армяне, кельты, германцы, балты, славяне, италийцы

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Introduction. Accepting the a priori existence of a certain area in some past, whose population spoke related IE dialects, continuously passing from one to another (the area of the IE continuum), we are faced with the problem of determining the boundaries (albeit conditional) of settlement areas of native speakers of separate IE dialects. As for the IE dialects themselves, there is some consensus among linguists. We can consider that on a certain stage of language evolution the Proto-Anatolian, Proto-Aryan, Proto-Tocharian, Proto-Greek, Proto-Armenian, Proto-Italic,

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Proto-Celtic, Proto-Germanic, Proto-Slavic and Proto-Baltic dialects, which are linguistically closer to each other rather than to languages from other language families, were distinguished, what is well-demonstrated in the graphical materials, for example, in [1]. But what data could let us define where Proto-Celtic dialect native speakers were settled with respect to Proto-Greek dialect native speakers? Or what non-IE surroundings the peripheral dialects of the IE continuum area were in contact with?

Features of archeological cultures are not determined by the native speakers of these cultures, and the correlation "culture-language" is far from always being reliable [2]. For this reason, despite there are a lot of archeological data at the territories which can be considered as the IE ancestral home (steppes of the Black Sea region, Balkans, Transcaucasia), the question of the linguistic affiliation of the tribes inhabiting these territories remains [3; 4].

Search for a common ancestral home of the IE language seems to be a dead end due to the mobility of its early native speakers and the complexity of the path passed by them before the split of the IE family [1]. We believe that the following words of O.N. Trubachev about the ancestral home of the Slavs are applicable to the IE ancestral home as well: "... it is appropriate to talk about the multicomponent nature of each language, finally, available written evidences of ancient eras directly show that the further back into the centuries, the more languages there were, but not the less... [5, p. 16]... "the entire Proto-Indo-European lexical fund could not have arisen in the same place at the same time"... We must base on the collective nature of a native speaker of the Proto-Indo-European, Proto-Slavic and any other lexical fund" [5, p. 94].

The dialect consolidation was happening in the process of involving of the native speakers of neighboring dialects into large-scale economical processes, including trade, mining and metallurgy. For example, metallurgy of copper, silver and lead in the Balkan-Carpathian Metallurgical Province (BCMP) contributed to the consolidation of dialects with the formation of the ancestors of the Baltic and Slavic languages [6]. At the end of the 4th and early 3rd millennium BC, public administration was added to such processes in many territories.

The reason for the subsequent divergence of dialects of the IE continuum into a large number of IE linguistic groups was local interactions of groups of IE dialects native speakers with various substrates of more ancient languages [7, p. 129] and adstrate interactions with the heterogeneous environment of the IE continuum, for example, the contacts between speakers of the Aryan branch languages of the IE family with the speakers of the Uralic languages, which were considered in [8].

The idea of search for traces of adstrate interactions between languages – ancestors of the present IE languages – with the aim of revealing ancient contacts between the native speakers of the ancient languages is not new, an essential number of works are dedicated to it. A work of Yu.K. Kuzmenko [9] is dedicated to linguistic traces of contacts between ancient Germans with possible neighbors. Several works of V.V. Napolskikh are dedicated to traces of adstrate interactions of the Finno-Ugric languages with the Baltic and Aryan languages [8; 10; 11]. The impact of adstrate interactions of the IE family with the Ural, Semitic and several others families has been estimated in [1].

The graphic materials [1, p. 149] clearly demonstrate the intermediate nature of the IE family. It is connected with four other families, while none of the other families is connected with more than two others. At the same time, the general picture does not correspond to the geographical position of families, and the location of languages within families looks chaotic.

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The aim of this article is an attempt to analyze linguistic data, which could let us reduce the uncertainty of the territory, on which dialects of the IE continuum had been coexisting, and about inter-dialect influences, in other words, about the space structure of this continuum. By analyzing language data, we will understand the search in the lexicons of IE languages-descendants for traces of older dialectic continua in the lexicons of IE descendant languages, traces of external borrowings that characterize non-IE surrounding of the area of evolution of the IE continuum basic dialects, and traces of adstrate interactions between the latter ones.

Methodology and sources. The disintegration of the BCMP and formation of the Circum-Pontic metallurgical province (CPMP) in the early bronze age, according to [12], led to the consolidation of number of Circum-Pontic ethnic groups, but the dialect structure of the areal of the forming IE "proto-language" remained undescribed. When constructing the structure of the IE dialect continuum we, as an initial approximation, will also link the area of the IE dialect continuum with the Circum-Pontic region.

For the study of the internal connections between IE dialects, just as in [1], Swadesh lists were chosen the lexemes of which were compared in pairs, the results of which comparison were placed into a matrix.

The choice of the basic vocabularies is due to their natural conservativity. This leaves us hope for a decrease in the influence of the difference in time between the documented states of ancient languages on the research result, assuming that the phonetic image of separate lexemes for the lists has not changed much over time, and, to acceptable extent, reflects initial corresponding IE-dialect prototypes. Having assessed the degree of neighborhood of speakers of separate IE dialects basing on the basic vocabulary, we would have the right to expand the area of comparison, including natural and economic terms, thereby checking / clarifying the preliminary conclusions.

Further, since we look for the traces of any adstrate interactions, we will not be concerned about the reasons for the similarities of the compared lexemes (borrowing or kinship), we only will need a subjective estimation of the possibility of understanding of lexemes with the same meaning on both sides of the contact border. We will take the number of potentially understandable basic lexemes in each pair of compared lists, taken in relation to a total number of lexemes, as a measure of the adstrate interaction of this pair of IE dialects, a measure of the degree of proximity of their native speakers. In this comparison not all related lexemes in the compared lists are taken into account, due to the noticeable phonetic discrepancy of many related pairs. For example, related Ancient Greek *κύων* and Old Indian *śvā́* 'dog' were excluded as mutually incomprehensible to ancient Greeks and Indians (i. e., they were not used by their ancestors to communicate with each other). By this and by choosing of the 207-word (but not the 50-word) Swadesh lists, the chosen method differs from the method of the matrix of indexes of similarity between the compared languages [1, с. 146].

To analyze the basic vocabulary, 207-word lists of Swadesh of the following IE languages were selected (the actual numbers of known lexemes are given in brackets):

– Hittite (180);

– Tocharian A (166);

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– Old Irish (205);
– Welsh (207);
– Ancient Greek (207);
– Latin (207);
– Old Indian / Vedic Sanskrit (206);
– Avestan (168);
– Gothic (194);
– Lithuanian (207);
– Old Church Slavonic (206);
– Old Armenian / Armenian (207).

In the presence of long-term intensive contacts between the ethnic groups, the commonality of vocabulary should not, of course, be limited to the basic vocabulary. Therefore, we will confirm the commonality of basic lexicons by similarities of important economic terms, etc.

For the geographical binding of the IE native speakers areal, borrowings from/into non-IE languages, ancient settlement areas of which are considered well-known (for example, the Altai tribes can be certainly considered more eastern than the Illyric ones, and the Semitic tribes – more southern than the Finno-Ugric ones), were chosen. Archeological and genetic data are being given as the additional ones in a few numbers of cases.

At last, the format of an article implies the presentation of characteristic examples, rather than a deep and detailed study of the vocabularies of the compared languages.

Results and discussion.

The similarities between lexemes of the IE languages.

The numbers of subjectively estimated pairwise similarities of the basic lexemes of twelve IE languages are represented in the table. The table also shows the uncertainty, resulting from the subjective way of similarity estimations: there are the most pessimistic and the most optimistic estimations of numbers of similarities, no more than 5 % of the lists length different from the average values. The maximum uncertainty occurred when Sanskrit and Ancient Greek, Gothic and Latin Swadesh lists were compared. Standard deviation was 2.2 % of the lists length, i. e. 4–5 words.

Kinship relations in the lists of two pairs of languages (Welsh – Old Irish and Avestan – Sanskrit) are obvious: the shares of similar words 2–3 times exceed the shares in any other pair of languages.

The lists of the understandable lexemes of the 207-word Swadesh lists are the following (the meanings from the 100-word Swadesh list are highlighted in bold):

– a group of languages strongly related to Sanskrit and to each other (Old Slavic, Lithuanian, Latin) – 'and', '**blood**', '**day**', '**die**', '**eye**', '**fire**', '**give**', 'mother', '**new**', '**nose**', 'right', 'three', '**two**', 'when' (14 lexemes of the 207-word list / 9 lexemes of the 100-word list);

– a group of languages moderately related to Sanskrit and weakly related to each other (Hittite, Tocharian A, Ancient Greek) – '**ground**', 'husband', '**new**', 'three', 'white' (5/2);

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Numbers of subjectively estimated pairwise similarities of the basic lexemes of twelve IE languages

	Toch. A	Hitt.	AGr.	OIr.	Goth.	Lat.	Sanskr.	Lith.	OCS	Arm.	Avest.	Welsh
Toch. A N_a = 166	166 100 %	14...27 (8...16) %	15...21 (9–13) %	13 8 %	16...23 (10–14) %	14...17 (8–10) %	22...26 (13–16) %	13...16 (8–10) %	13 8 %	8...12 (5–7) %	8...13 (5–8) %	11…14 (7–8) %
Hitt. N_a = 180	14...27 (8...16) %	180 100 %	17...24 (9–13) %	8...14 (4–8) %	16...21 (9–12) %	16...20 (10–12) %	23...34 (13–19) %	8...13 (4–7) %	7...8 4 %	5...7 (3–4) %	14…26 (8–15) %	3…8 (1–4) %
AGr. N_a = 207	15...21 (9–13) %	17...24 (9–13) %	207 100 %	8...17 (4–8) %	12…22 (6–11) %	32...41 (15–20) %	24...45 (12–22) %	17...26 (8–13) %	20...27 (10–13) %	19...30 (9–14) %	16...32 (10–19) %	14…22 (7–11) %
OIr. N_a = 205	13 8 %	8...14 (4–7) %	8...17 (4–8) %	205 100 %	23...30 (12–15) %	28...38 (14–19) %	10...15 (5–7) %	22…27 (11–13) %	15...16 (7–8) %	10...14 (5–7) %	8...15 (5–9) %	69...80 (39–45) %
Goth. N_a = 194	16...23 (10–14) %	16...21 (9–12) %	12…22 (6–11) %	23...30 (12–15) %	194 100 %	32...51 (16–26) %	12...14 (6–7) %	27...32 (13–15) %	14...22 (7–11) %	17...20 (8–10) %	18…24 (11–14) %	15…22 (9–13) %
Lat. N_a = 207	14...17 (8–10) %	16...20 (10–12) %	32...41 (15–20) %	28...38 (14–19) %	32...51 (16–26) %	207 100 %	46 22 %	34...38 (16–18) %	29…32 (14–15) %	12...25 (6–12) %	24…35 (14–21) %	28…33 (14–16) %
Sanskr. N_a = 206	22...26 (13–16) %	23...34 (13–19) %	24...45 (12–22) %	10...15 (5–7) %	12...14 (6–7) %	46 22 %	206 100 %	46...48 (22–23) %	39...51 (19–25) %	13...24 (6–12) %	95...103 (57–61) %	14...19 (7–9) %
Lith. N_a = 207	13...16 (8–10) %	8...13 (4–7) %	17...26 (8–13) %	22…27 (11–13) %	27...32 (13–15) %	34...38 (16–18) %	46...48 (22–23) %	207 100 %	50...58 (24–28) %	19...26 (9–13) %	25…34 (15–20) %	15…17 (10–12) %
OCS N_a = 206	13 8 %	7...8 4 %	20...27 (10–13) %	15...16 (7–8) %	14...22 (7–11) %	29…32 (14–15) %	39...51 (19–25) %	50...58 (24–28) %	206 100 %	7...11 (3–5) %	23…32 (14–19) %	13...18 (6–9) %
Arm. N_a = 207	8...12 (5–7) %	5...7 (3–4) %	19...30 (9–14) %	10...14 (5–7) %	18...21 (9–11) %	13...26 (6–13) %	13...24 (6–12) %	19...26 (9–13) %	8...12 (4–6) %	207 100 %	11...20 (7–12) %	11...18 (5–9) %
Avest. N_a = 168	8...13 (5–8) %	14…26 (8–15) %	16...32 (10–19) %	8...15 (5–9) %	18…24 (11–14) %	24…35 (14–21) %	95...103 (57–61) %	25…34 (15–20) %	23…32 (14–19) %	11...20 (7–12) %	168 100 %	9…18 (5–11) %
Welsh N_a = 207	11…14 (7–8) %	3…8 (1–4) %	14…22 (7–11) %	69...80 (39–45) %	15…22 (9–13) %	28…33 (14–16) %	14...19 (7–9) %	15…17 (10–12) %	13...18 (6–9) %	11...18 (5–9) %	9…18 (5–11) %	207 100 %

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– a group of languages moderately related to Latin and weakly related to each other (Gothic, Old Irish, Ancient Greek) – '**ear**', '**eat**', '**horn**', '**name**', '**new**', 'other', 'right', '**you**', 'three', '**two**' (10/7).

If we search for lexemes understandable for native speakers of any four languages, which are not included into one and the same group of the groups mentioned above, there will be not many such lexemes, namely, some 3 or 4 lexemes meaning 'new', 'salt', 'this', 'you', 'three', two', plus one or two meanings more. For example, in the group: Welsh (closely related to Old Irish), Latin, Ancient Greek, Hittite – only the basic lexemes with the meanings **'new'**, 'three', '**two'** (3/2) might be understandable for all the speakers, and in the group: Avestan (closely related to Sanskrit), Latin, Ancient Greek, Hittite – only lexemes meaning **'bone'**, **'new'**, 'three' (3/2) might be understandable for all the speakers.

It leads to the idea about the initial heterogeneity of the IE continuum: in the continuum there is a core with strong relations (numbers of similarities in between exceeds other numbers by 2–3 standard deviations of the estimate) – Proto-Aryan, Proto-Italic and Proto-Baltic – and two peripheral language groups: a) Proto-Anatolian and Proto-Tocharian, close to Proto-Aryan, and b) Proto-Germanic and Proto-Celtic, close to Proto-Italic. Proto-Greek is equally close to Proto-Aryan and Proto-Italic. The greatest numbers of similarities are within the range of (15–26) % of the lists length. The basic vocabulary of Proto-Armenian is approximately equally (9–12) % close to the basic vocabulary of Proto-Greek, Proto-Baltic, Proto-Germanic, Proto-Italic and Proto-Aryan.

It should be noted that developed systems of declension with a large number of cases (nominative, genitive, dative, accusative, vocative, instrumental, local, ablative) had been formed only in the core dialects. As concerns the rest IE dialects, their case systems are simplified.

The data in the table concerning the strongest connections between basic vocabularies (15–26) % can be illustrated graphically (figure). The value of similarity of Latin and Lithuanian lists is in the same range of values of similarity. The values of similarity of other pairs of basic vocabularies of IE languages lie in the range (3–14) % and indicate a gradual loss of contacts between the native speakers of these languages before the time of their registration, with the exception, perhaps, of trade contacts maintaining the similarity of pronunciation of numerals, personal and demonstrative pronouns and the names for such a popular product as salt.

We have the right to suggest that the geometry of the figure 1 correlates with the geography of settlement of the Proto-IE languages native speakers, assuming that the maximal similarities of their basic vocabularies correlate with the most intensive adstrate interactions.

For our linguistical research of the geography of settlement of the Proto-IE dialect continuum native speakers, we will be interested in adstrate interactions between the descendants of the IE dialect continuum given in the figure (for positioning of IE dialect areas with respect to each other), as well as in interactions of the IE-continuum with non-IE languages, including interaction with the substrate of earlier states of the dialect continuum (which gives a possibility of the absolute geographical binding of the area occupied by the IE dialect continuum).

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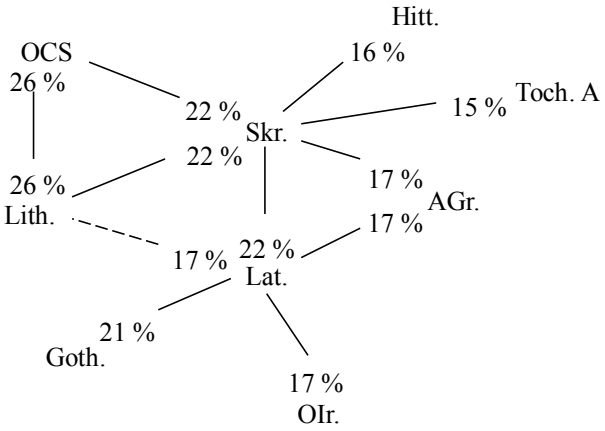

Graphical representation of the average estimates of the strongest IE interdialectal relations

The axis of symmetry "Sanskrit–Latin" stands out in the figure, which is, whether by chance or not, corresponding to the juxtaposition of the ethnic groups in which the Y-haplogroup R1a is predominating (Aryans, Balto-Slavs, Anatolians and Tocharians) and the ethnic groups in which the Y-haplogroup R1b is predominating (Italics, Celts and Germans). Probably, in the cultural attitude, this axis corresponds to the influence of the Mediterranean R1a on the Yamnaya (Pit Grave) culture R1b (see Klyosov [13, p. 146], about superstratum R1a vs substratum R1b on the territory of the Catacomb culture). The advance of the R1a from the west to the territory of Yamnaya culture in the 3rd millennium BC correlates with the appearing of subclades of Samara Yamnaya people in Mesopotamia [13, p. 138], which shows the direction of R1b migrations: from the Yamnaya Horizon – to the south.

At the same time, the distribution of values of neighborhood indexes (figure), evidently, expresses lexical diffusion in the direction from Proto-Baltic and Proto-Slavic dialects to Proto-Greek-Aryan-Italic (with a slight decrease in indexes) and further to peripheral dialects (with a further decrease in indexes): Proto-Anatolian, Proto-Tocharian, Proto-Greek, Proto-Celtic and Proto-Germanic.

In the historical context, this corresponds to the earlier industrial development of the Balkan-Carpathian region within the Vinca culture, which development contributed to both the dialectal consolidation of the region and the early development of writing in there by the middle of the 4th millennium BC. The result of comparison of the Vinca and other ancient writings is interesting: the Etruscan alphabet is completely identical to the Vinca alphabet, in the Serbian Cyrillic alphabet there are 20 letters similar to the letters of the Vinca alphabet, and no more than 12 (ancient Greek writing) of 26 in other ancient scripts [14]. Influence of the language of the leading ethnic group on other languages was observed regularly: English, Spanish, Latin, Ancient Greek, Aramaic in different periods of history played a unifying role either as languages of interethnic communication or as state languages.

Traces of contacts of Northern IE languages/dialects with languages of Uralic and Altaic families (and manifestations of the Nostratic substratum).

Lexical signs of geographical neighboring of the IE and the Uralic dialect continua are markers of the northern part of the area of IE languages/dialects. Some of these signs suggest the presence of an ancient common substrate language, a set of dialects of hunters of the late Pleistocene.

Symmetrically, in the Proto-Finno-Ugric (PFU) there are IE terms of the trade jargon, discovering early contacts of the PFU and IE dialects native speakers [15, p. 206–207].

The North–North East group of IE languages is distinguished by lexical traces of the Nostratic substrate continuum – lexemes with meanings 'ice' and 'predator (bear, wolf, leopard)', also present in the Ural and Altai language families, the native speakers of which were never located either north or west of settlement area of the IE languages native speakers.

Compare Finnish *jää*, Moksha *aej*, Hungarian *jég*, Estonian *jää*, North-Sami *jiekŋa*, Mansi *яӈк*, Khanty *йәӈк* 'ice' with:

– Anatolian: Hittite *ekan*;

– Aryan: Avestan *aeχa*- 'ice, frost', Hindi *yak͟h͟a*; Ossetian *ux* [ix], *ex* [ex], Persian یخ [jax];

– Celtic: Old Cornish *iey*; Welsh *iâ*, Old Irish *aig*, Gaelic *eighe*;

– Germanic: Old Norwegian *jaki* 'ice floe', *jǫkull* 'glacier'; Gothic *eis*, Old English *īs*, West Frisian *iis*, Dutch *ijs*, Low German *Ies*, German *Eis*, Danish, Swedish and Norwegian *is* 'ice';

– Albanian *akull* 'ice'; (noteworthy is the similarity with Old Norwegian *jǫkull* 'glacier').

The southernmost similar sounding name for ice is the Abkhazian *ацаа* 'ice', here also, however unexpected it may seem, Basque *izotza*, which supports the hypothesis about Caucasian relations of Basques.

Further, compare the names for predators (bear, wolf, leopard) derived from the Nostratic onomatopoeia to growl [16]: Nenets *варк* [wark], Finnish *karhu*, Hungarian *farkas* 'wolf' (unlikely to have been derived from *farok* 'tail', since a tail is not a hallmark of a wolf); Manchurian *jarəhə*, Nanai *jarga* 'leopard'; Middle Korean *írhì* 'wolf' – with:

– Anatolian: Hittite *hartagga* 'predator';

– Ancient Greek *ἄρκτος* [bear];

– Aryan: Ancient Indian *ṛ́kṣa*-, Romany *rich*, Avestan *arša* 'bear';

– Celtic: Welsh *arth* 'bear';

– Albanian *ari* 'bear';

– Old Armenian արջ (*arǰ*) 'bear';

– Italic: Latin *ursus* 'bear'.

Basque lexeme *hartz* 'bear' turned out to be similar to the Nostratic lexemes in this case too. In Balto-Slavic languages, the names for bear are different from the above and between each other.

The region of spread of the similar lexemes seems to have been coincided with the area to the east and southeast of the zone of the last European glaciation in its maximum phase. Due to the fact that the glacier separated the Balkan refuge and the forest zone of Southeastern Europe, the substrate names for ice turned out to be different in these areas. This can explain why FU names for ice had been derived from a common ancestor, but the IE names had not been (in Balto-Slavic, Armenian and Italic names for ice had been derived from other prototypes).

As for Tocharian lexemes meaning 'ice' and 'bear', I could not find them. However, L.S. Klein confidently writes about the FU substrate in Tocharian languages also [17, p. 183].

The phonetic proximity of the areal designations of hand is also interesting: Finnish *käsi*, Sanskrit हस्त *hasta*-, Hittite *kissar* (or *keššar*), Tocharian A *tsar*, Tocharian B *ṣar*. So far, our results are close to the results of [1, p. 157]: the Hittite language in the above examples shows a special affinity to Finno-Ugric languages.

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The fact that IE proto-dialects, which had close relations with Proto-Aryan dialect, contacted with the Nostratic substrate and, in many cases, with Proto-Finno-Ugric languages at the same historical time, is evidenced by the phonetic similarity of the lexemes of these proto-languages used for designating natural objects and phenomena, despite on the belonging of their descendants to different groups of IE languages:

– lexemes with the meaning 'earth':
  – Tocharian: Proto *tkaṃ*, Tocharian B *keṃ*;
  – Anatolian: Hittite *tekan*, Hieroglyphic Luwian *takamia*;
  – Albanian *tokë*;
  – close – Ancient Greek *χθών*; farther – Aryan: Old Indian *kṣáḥ*, acc. *kṣām*; the related ones in other languages are completely different;
– lexemes with the meaning 'flow of water, river':
  – Tocharian: Tocharian A, Tocharian B *āp* 'water, river';
  – Anatolian: Hittite *hap*(*a*)- 'river, flow', пал. *hapnas*, Luwian *hapinni*-;
  – Aryan: Old Indian *ap*-, Avestan *afš*, acc. *āpəm* 'water';
  – Italic: Oscan, Umbrian *aapa* 'water';
  – Celtic: Old Irish *aub*, Middle Welsh *afon*; the related ones in other languages differ;
– lexemes with the meaning 'rain' and the similar ones:
  – Tocharian: Tocharian A *wär*, Tocharian B *war* 'water';
  – Anatolian: Hittite *warsa* 'rain' [18, Russ. meaning: water, влага], Luwian *wārša*;
  – Aryan: Old Indian *varṣá*- 'rain', *vār*, *vāri* 'water'; Avestan *vār*- 'rain';
– lexemes with the meaning 'wind' and the similar ones:
  – Tocharian: Tocharian A *want*-, *wänt*- 'wind';
  – Anatolian: Hittite *huwant*- 'wind';
  – Aryan: Old Indian *vānt*- 'blowing', *vā́ta*- 'wind', Avestan *vātō* 'wind';
– lexemes with the meaning 'fire':
  – Tocharian: Tocharian A *por*, Tocharian B *puwar*;
  – Anatolian: Hittite *paḫḫur*, Luwian *pāḫūr*;
  – close – Ancient Greek *πῦρ*; Armenian *hur*; Old Norwegian *fūrr*; Umbrian *pir*;
– but Aryan, Celtic and one Greek synonym are included in other groups:
  – Old Indian *agní*- 'fire' (with Balto-Slavic and Latin analogs);
  – Ancient Greek *αἶθος*, Old Irish *áed*, Avestan *āt*(*ə*)*r*-;
– lexemes with the meaning 'blood':
  – Tocharian: Tocharian A *ysār*, Tocharian B *yasar*;
  – Anatolian: Hittite *ēšhar*, gen. *išhanāš*;
  – Aryan: Old Indian *ásṛk*, gen. *asnáḥ*;
  – Ancient Greek Homer's '*ισχώρ* 'immortal blood of gods';
  – Latvian *asinis* looks similar.

In other languages, other roots have been used for designation of the same concepts, or the phonetical image of lexemes, related to the given ones, did not contribute to understanding (compare, for example, Hittite *tekan* and Old Slavic *земль* [zemlę]).

These data allow us to suggest that some of the IE dialects, whose areas were neighboring with PFU (Proto-Tocharian, Proto-Anatolian, less often – Proto-Aryan), closely interacted

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with each other and, to a less extent, with the Proto-Greek dialect, forming the northern subcontinuum of the IE dialect continuum (the "Proto-Aryan+" subcontinuum). Similarities of lexemes with meanings 'flow of water, river' and 'bear' trace contacts between the northern subcontinuum dialects and Proto-Italic dialect. Ancestors of Albanians, Armenians and Celts probably have got names for bear similar to others through a common substrate continuum and in different time, the same in Celtic and Albanian names for ice – these ethnic groups do not have close ties with ethnic groups of the northern subcontinuum.

Indo-Aryan names for horse were included in the group of names of the "Indo-Aryan+" subcontinuum together with Anatolian and Tocharian ones. This tells us about the time of horse domestication: it had taken place before the beginning of migration of native speakers of the northern IE-continuum dialects to the west, south and east. The appearing of forms *ašvà* 'mare', dial. *ešvà*, in Lithuanian along with the original form *kumele* can be explained by the contacts of Proto-Balto-Thracians with "Indo-Hittites" in steppes or with Hurrians in Asia Minor (compare with Old Indian *áśva-*, Hittite *aś*(*u*)*was* and Hurrian *ešše* 'horse').

IE lexemes with the meaning 'wheel' seem to claim that its invention took place after the separation of Tocharians and Anatolians – the languages of these ethnic groups used the root different from roots in other languages of the northern IE continuum for the designation of wheels [15, p. 204] (Hittite *hurki-* and Tocharian A *wärkänt*, B *yerkwanto* 'wheel', the Tocharian ones being phonetically far from the Hittite one). However, Tocharian A *kukäl*, B *kokale*, similar to the Ancient Greek designation of a wheel, demonstrate the presence of adstrate relations between Proto-Tocharians and Proto-Greeks even after invention of wheels in steppes, despite the semantical shift 'wheel' > 'cart'. This may indicate that IE dialectal names for wheels had been appearing with their spread using synonymous roots, just as in Slavic languages, where semantically similar concepts *лить* 'to pour' (> Russian *залив*) и *течь* 'to flow' (> Ukrainian *затока*) were used to designate bays, which fact does not mean that Russians and Ukrainians got acquainted with bays after the separation of their languages.

Traces of contacts of eastern IE languages/dialects with Eastern Asia languages (and manifestations of Nostratic, Sino-Caucasian and Austronesian substrates).

The fact that PIE speakers were familiar with cattle and sheep herding, dairy foods, woolen textiles, agriculture, wagons, honey and mead, and horses would suggest a location west of the Urals at any time before 2500 BCE, because horse-sheep-and-cattle pastoralism was not practiced east of the Urals before this date [15, p. 207].

In the vicinity of this boundary, contacts of IE tribes with native speakers of both Uralic and Altaic languages should have taken place. Moreover, besides Nostratic substrate, IE languages-dialects could incorporate elements of Sino-Caucasian and Austronesian substrates, whose speakers never dwelled to the west with respect to IE native speakers.

Lexemes with the already mentioned meanings 'bear' and 'hand' can be viewed as traces of contacts of ancestors of northern Germans with speakers of Austronesian continuum, compare:

– Austronesian **beruang* 'bear' – and Old English *beorn*, Old Norse *birna*, *bjǫrn* 'bear';

– Austronesian **lima* 'hand' > 'five' – and Old English *lim*, Old Norse *limr* 'limb'.

Lexemes with meanings 'ox, bull' can be viewed as probable traces of adstrate contacts of Altaic and IE tribes, compare Altaic lexemes (Uighur *xöküz*, Kumyk *oquz*, Balkar, Karaim *öqüz*,

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Yeniseian, Turkmen, Azerbaijani, Turkish *öküz*, Bashkir *үгеҙе*, Tatarian *үгез* 'bull', Chuvash *вăкăр*, Mongolian *үхэр*) and:

– Aryan: Avestan *uxšan* 'bull', Sanskrit उक्षन् (*ukṣán*);

– German: Islandic *uxinn*, Old English *oxa*, West Frisian *okse*, Dutch. *os*, German *Ochse*;

– Tocharian: A *ops*, B *okso* 'ox';

– Celtic: Welsh *ych*;

with no cognates in Anatolian, Italic, Armenian, Greek, Slavic, Baltic and Albanian languages.

Kartvelian and Uralic analogs seem to be loanwords:

– Kartvelian: Old Georgian ჳსხი (*usxi*), Svan *usxwaj* (Lashkh.), *wisxw-* (L.-Bal.) 'sacred bull'; as for the metathesis in Kartvelian, compare with the metathesis in the common Kartvelian borrowing from the IE **otxo* 'four';

– Uralic: Hungarian *ökör*, Volga-Perm *uska* // *oska* 'bull, little bull' [19, p. 154–158].

Some Celtic and Germanic names for horses also look strange for IE languages:

– Celtic: Old Irish *marc* 'horse', Middle Welsh *march* 'horse, stallion', Breton *marc'h*;

– Germanic: Old Norwegian *marr*, Old English *mearh*, Middle English *mare*, Middle High German *Marah* > *Mähre* 'horse, mare'.

Gamkrelidze and Ivanov had supposed a borrowing from some Altaic language. Celtic-Germanic **mark-* is parallel to the Altaic **morV-* (Mongolian *mörin*, Kalmyk *morin* 'horse'; compare also Chinese *ma* < **mra*, Tamil *mā*). Garkmelidze and Ivanov have explained this borrowing by early contacts of IE tribes with Altai tribes. Moreover, they have supposed that it is the evidence of early migrations of IE tribes from the east to the west through Asia Minor. However, the fact that this borrowing had been used only in the most remote from the source languages, remained strange. Mikhailova suggested a hypothesis about a Wanderwort of the eastern origin, brought to the Europe by Scythians and Sarmatians, who could be the mix of ethnic groups of the Central Asia, generally speaking Iranic, but also with Turkic and Altaic elements [20, p. 6–7].

Such counterarguments to the hypothesis of Gamkrelidze and Ivanov are clearly based on the belief in the autochthonous nature of Celts and Germans, which means that conceivable explanations for the appearance of Altaic words in the Celtic and Germanic languages are reduced exclusively to the search for ways of transferring words from Altai to Western Europe.

Nevertheless, V.V. Ivanov pointed at relations between German languages and Yeniseian language [21, p. 155–156], which tells about contacts of ancestors of Germans with Asian tribes, i. e., the transfer of the eastern names for horse could take place somewhere in the Caspian steppes rather than in Europe. Right there, where German and Celtic languages acquired the following 'copies' of lexemes characteristic of Eastern languages:

– Old English *hēla* 'heel' и *guttas* 'guts' are similar to the Mongolian *хөл* 'foot' and *гэдэс* 'guts';

– English *fang*, Old English *fang* 'to capture' compare with the FU: Mansi *puŋk*, Khanty *pöŋk*, Hungarian *fog*, Saami *pānnj* – and Chinese *fāng*, less often in combinations *páng* 'wedge', 'to capture' (almost exact semantic coincidence with Eng.);

– English, Dutch *top*, Frisian *top*, *tap*, Low German *Topp*, Islandic *toppur* 'top', which allegedly have no reliable connections outside Germanic [22, Search: top], are comparable with Crimean Tatar *töpe*, Karachay-Balkar *menne*, Azerbaijani *täpä* 'top';

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– Old English *þing*, Old High German *ding* 'council' phonetically and semantically coincide with the Chinese *tíng* or *dìng* 'court (especially: of the Emperor's palace)'; 'Emperor's palace'; 'place of meeting (of dignitaries at court)'; 'right, straight'; 'straight, fair';

– Old Irish *bec*(*c*), Breton *bihan* and Welsh *bychan* 'small' – have common Celtic antiquity, do not have IE etymology, but have analogs in the Altaic languages (compare Tuvan *biča*, Karagas *bic'ä*, Yakut *byčyk*, Mongolian *biči* 'small') and in some Uralic (Veps *piču* 'small', Karelian *pićukkani* 'very small');

– search for analogs of Old Irish *macc* 'son' leads to Altaic **mūko*- 'man, boy' and Dravidian **mayI* 'child' (in particular, Tamil *maka* 'child, son, boy'): the phonetical and semantical similarity is obvious, but it is not clear whether this is a borrowing or derivation from a common Nostratic prototype – T.A. Mikhailova suggested a compromise borrowing from the pre-IE Nostratic language, semantically supported by Celtic derivatives from IE **maghu*- 'guy, unmarried' [20, p. 11];

– Old Irish *u*(*i*)*sce* (and Alb. *uje*) 'water' could be phonetically compared with Mong. *yc*, Kalm. *усн* 'water' and do not resemble any of the IE analogs.

In addition to traces of the Nostratic and Sino-Caucasian substrates, in Celtic and Germanic languages there are unique traces of rapprochement to each other:

a) 'number':

– Old Irish *rím*, Welsh *rhif* 'number';

– Old English, Old Frisian, Old Saxon, Old High German *rīm*, Old Islandic *rím* 'number';

– Scythian *άριμα* 'one' [23, bk. 4.27];

b) 'louse':

– Germanic: Old English, Old Norwegian, Old High German *lus*, Middle Dutch *luus* 'louse' [22, Search: louse];

– Celtic (Brittonic): Old Cornish *lowen*, Welsh *lleuen*, pl. *llau*, Breton *laouen* 'louse' [18, Meaning: louse].

Let us pay attention to the similarity of these lexemes with Iberian-Ligurian-Romanian lexemes with the meaning 'nit': Spanish *liendre*, Portugalian, Galician *l'endea*, Catalan *ll'emena*, French *lente*, Latin *lens* etc. – in their turn, similar to the Chinese *luǎn*, *luǒ* 'insect eggs'. Perhaps, it is a trace of Sino-Caucasian continuum, the substrate of Proto-Celtic, Proto-Germanic and Proto-Italic IE dialects. The existence of such a substrate is also evidenced by the connections between the Hatti, Hurrian, Caucasian and Yenisei non-IE languages [21, p. 134–144, 155–156].

Following Gamkrelidze and Ivanov, we will consider all such similarities as indirect evidences for contacts of some ancestors of Celts and Germans in the age of horse domestication with each other and with Altaic, Sino-Caucasian and Austronesian ethnic groups in the area of the eastern ("Proto-North-Germanic+") subcontinuum of the IE dialect continuum.

Traces of contacts of the southern IE languages-dialects with the languages of the Transcaucasia and the Middle East (and manifestations of Afro-Asiatic substrate).

The southern – southwestern group of IE dialects is distinguished by lexical traces of the Afro-Asiatic dialect continuum, which is also present in Semitic languages, native speakers of which were never located north or east of the area of native speakers of IE languages.

Let us investigate which dialects of the IE continuum have traces of such contacts.

A term for ice, different from other IE lexemes with the same meaning, exists in Latin: *glacies*. It can be etymologically derived from the IE root **gel*- 'cold', Latin *gelidus* 'icy, frosty' having also

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been derived from it. In its turn, the latter has traces in Semitic: Syrian ܓܠܝܕܐ (*gəlīḏā*), Hebrew גְּלִיד (*gəlîḏ*), Arabian جَلِيد (*jalid*), all meaning 'ice'. Regardless of the origin of the root *gel-, it indicates ancient contacts between ancestors of Latins and ancestors of Semits.

Further, let us note lexemes with the meaning ‘lion’, words of the same importance for southern peoples, as lexemes with the meaning ‘bear’ for northern ones. They are also being derived from the onomatopoeia of roar [24]: Egyptian *rw*, Mubi *ʔórúwà*, Hebrew *aryeh*, after [r] > [l] – Akkadian *lābum* 'lion'; Arabian *labuʾah* 'lioness', Hebrew *lavi* (archaic), *lāḇīʾ* 'lion', *levi'ah* 'lioness', compare them with:

– Slavic: Old Slavic львъ, Serbian лав, Polish lew, High Lusatian, Low Lusatian law;

– Italic: Latin *leō*;

– Germanic: Old High German *leo*;

– Celtic: Irish *leon*, Welsh *llew*;

– Ancient Greek *λέων*;

– farther phonetically – Baltic: Lithuanian *liūtas*.

Let us also note the lexemes denoting cattle, which are present in a number of IE and Semitic languages.

Compare Arabian ثَوْر (*θawr*), Aramaic *tawrā* 'bull, ox' [25, Search: Reconstruction:Proto-Semitic/ṯawr-] with:

– Italic: Latin *taurus*, Oscan *turuf*, *toru*;

– Ancient Greek *ταύρος*;

– Baltic: лит. *taũras*, Old Prussian *tauris* 'bison';

– Slavic: Old Slavic *моуръ*;

– farther phonetically – Celtic: Middle Irish *tarb*, Welsh *tarw* – and Germanic: Old Norwegian *ǿjōrr*; there are no cognates or borrowings from Lat. in other IE languages.

Take into account that in Slavic languages there are both southern and northern lexemes for cattle, which suggests an intermediate position of Proto-Slavs between native speakers of the southern and northern groups of IE dialects.

It is also appropriate to give regional areal terms for 'horn' here, compare Arabian *qarna*, Hebrew *qerenn* with:

– Italic: Latin *cornu*;

– Celtic: Breton *korn*, Welsh *corn*, differently in Goidelic languages – Old Irish *adarc*, a possible borrowing from the Basque **adar-ko* ‘small horn’ (from the Basque *adar* 'horn');

– Germanic: Gothic 𐌷𐌰𐌿𐍂𐌽 (*haurn*), Old English, Old Saxonian, Old High German *horn*.

There are related, but phonetically different lexemes in other languages. In the languages of the northern subcontinuum, these are lexemes with the satemization of the first consonant:

– Anatolian: Hittite *surna*, Luwian *zurni*;

– Aryan: Sanskrit शृङ्ग (*śṛṅga*), Avestan *srū-*, *srvā-*;

the latter obviously resembling Finno-Ugric lexemes: Estonian *sarv*, Hungarian *szarv*, Finnish *sarvi* 'horn'.

One can also trace noticeable contacts of ancestors of Latins with Transcaucasian tribes. The Latin lexeme *tabeo* 'to melt' is undoubtedly related to the Hurrian lexeme *tabrinni-* ‘blacksmith’ with the verbal stem *tav-* ‘to melt (metal)’. They also say that Armenian *darbin* 'blacksmith' is

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related to Hurrian *tabrinni-* 'blacksmith' and Sumerian *tabira* / *tibira* 'coppersmith', probably, from an Urartian source (with the metathesis -br- > *-rb-) [26, p. 268–270]. Old Armenian ոսկի (*oski*) 'gold', Sumerian *guškin* 'gold' and Hurrian *ušḫu* 'silver' evidently have the common origin.

Gothic 𐌰𐌹𐍆 (*aiz*), Latin *aes* Proto-Aryan – Sanskrit *ayas* and Avestan *aiiah* 'metal' – are cognates and seem to be related to the Altaic names: Bashkir *eҙ*, Kazakh and Kyrgyz *жез* – with the specific correspondence of the Mongolian, Kazakh and Kyrgyz [ʒ] to the Turkic [j].

Considering possible relation of Finno-Ugric names for metal: Fin. *vaski* 'copper', Hung. *vas* 'iron' (having in mind semantic drifts) – with Tocharian A *wäs*, Armenian *oski* 'gold', Hurrian *ušḫu* 'silver' and Sumerian *guškin* 'gold', we can construct for the 3th millennium BC, the time of the wide familiarization of peoples with gold, a sequence of ethnical relations from the west to the east (from the Transcaucasia to the Ural): Sumerians, Armenians, Hurrians, Tocharians, Finno-Ugrians [27].

Proto-Celts are also manifesting the cultural affinity to the Caucasus, in particular, in the vigesimal numeral system in Celtic languages, characteristic of the majority of Caucasian languages. Traces of the vigesimal numeral system are also present in Albanian:

– *njëzet* 'twenty (one-twenty)' and *dyzet* 'forty (two-twenty)',

while Vasconic numeral system is wholly vigesimal:

– hogei 'twenty', berrogei 'fourty (two-twenty)', hirurogei 'sixty (three-twenty)', laurogei 'eighty (four-twenty)',

which shows the possibility of Caucasian past of ancestors of Albanians and Basques.

Traces of the vigesimal numeral system in Danish are more likely due to Celtic substrate in Northern Europe, since no such traces have been found in other Germanic languages [28].

Let us note that in Old Irish *coic*, Latin *quinque* 'five' and Armenian *hinkh*, *hing*, contacts of ancestors of Celts-Goidels, Armenians and Latins with Caucasian dialect continuum speakers also can be traced, since there are North Caucasian lexemes with the meaning ‘fist’, phonetically close to each other and the mentioned IE lexemes [29, p. 119]. In zoonyms with the meaning ‘wolf’, one can see difference in ethnical surrounding of Goidels and Britts after their separation, compare:

– Old Armenian գայլ (*gayl*) and Middle Irish *fáel* [fɯ:l] < **waylos* 'wolf (howling)' [25, Search: fáel],

– vs Welsh *blaidd* and Lithuanian *bliauti* 'to howl' (the etymology of the Welsh zoonym is considered unexplained [25, Search: blaidd], but we think it can be explained by Britto-Thracian contacts).

In the phonology of Welsh there are features which coincide with features of a number of Caucasian languages: the presence of voiceless lateral approximant [l̥] and voiced labiovelar [g^{w}] – for example, the Welsh lexeme *gwyn* 'wine' sounds the same as Georgian *ɣwino-* 'wine', with the absence of labiovelar sounds in the beginning of lexemes with the meaning ‘wine’ in other IE languages.

Celtic sentences have a basic verb–subject–object typology (“Reads the son a book”), just as in Ancient Egyptian, North-West Caucasian languages, classic Arabic, Maya, Tagalog and a number of languages of Southeast Asia islands. Moreover, Maya also has the vigesimal numeral system, this can be explained by the Altai past of the ancestors of Maya in the neighborhood with the ancestors of Celts [30].

This word order can be a typological parallel as well, which is due either to the role of verb names in the listed languages, different from the role of verb names in non-Celtic languages of the

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Indo-European family, or it can be explained by Semitic-Hamitic substrate with respect to Celtic [31, p. 8–10]. However, considering Altaic and Caucasian contacts of Proto-Celts, it would be logical to admit that this Semitic substrate was localized in the surroundings of the Caucasus, especially since the Maikop culture of the North Caucasus, after V. A. Gorodtsov (1910) and M.I. Rostovtsev (1920), is often associated with Semitic roots from Mesopotamia.

The Middle Irish *ert*, Gothic *aírþa*, Old Norwegian *jǫrð*, Old High German *erda* 'earth' can be traces of Afro-Asiatic dialect continuum in the vocabulary of ancestors of Celts and Germans (compare with Arabian *ard*, Swahili *ardhi*, Akkadian *erṣetu* and many others).

The same can be applied to German and Dutch terms for 'horse', derived from Old Semitic ones [8].

Germanic languages have some other traces of contacts with southern non-IE languages:

– English *dig* and *dagger*, with allegedly very unclear origins [22], can be related to Chechen *ɔaɾ* [dag] 'axe' (with its possible Hurrian origin); analogic semantical affinity of terms for an instrument (or an action) and a weapon we also see in English *spade* / Spanish *espada* 'spade / sword', in English *bill* 'small axe / sword' and in Welsh *clodio* 'to dig'/ *cledd*, *cleddif* 'sword';

– Old English *hnecca* 'neck, the back part of a neck' (rather a rare word), Old Frisian *hnekka*, Old Norwegian *hnakkr*, Old High German *hnach* 'neck' have the common origin with the Arabian *unk*, *unuk* 'neck', Aramaic *ʔunḳā* 'neck, cervical meat'; here is also Tocharian A *kñuk* 'neck' (Tocharian languages, according to Ivanov [23, p. 156], show traces of connections with the Hurrian language, and this circumstance, just as the fact that Tocharian A *kñuk* 'neck' has a Semitic origin, possibly, indicates intermediate contacts of Tocharians with the "Hurrian-Semitic symbiosis" [21, p. 155]);

– Old Islandic (Old Norwegian) fill 'elephant', as well as Tajik *пил*, are obviously related to Arabian *fil* 'elephant' – (Portugal *fila* "snake" is curious: the association of an elephant and a snake also is present in Indian – Old Indian *nāgas* 'snake, elephant', Sanskrit *nāga* 'snake, cobra', *nagaja* 'elephant').

Numeral systems of Old Germanic languages (Gothic and Old English) have traces of a numeral system with bases 12 and 60, that is, traces of ancient cultural ties of the ancestors of Germans with peoples of Mesopotamia to their south, who used such numeral systems. Similar traces are also present in numerals of Middle Persian and other Iranian languages, which apparently indicates the ancient neighborhood and cultural ties of speakers of these languages with ancient Germans and peoples of Mesopotamia [32].

A number of lexemes denoting natural phenomena indicate exclusive or almost exclusive adstrate contacts between ancestors of Latins and Celts:

– lexemes with the meaning 'earth':
  – Italic: Latin *terra*, Oscan *teras*;
  – Celtic: Old Welsh *tir*, Old Irish *tír*, Gaelic *tìr*;
  – differently in other languages;
– lexemes with the meaning 'mountain':
  – Italic: Latin *mōns*;
  – Celtic: Middle Welsh *mynyð*, Breton *menez* (absent in the Goidelic ones);

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– differently in other languages;

– lexemes with the meaning ‘wind’:

– Italic: Latin *ventus*;

– Celtic: Welsh *gwynt*;

– close – Tocharian B *yente*; Germanic: Goth *winds*, Old English *wind*;

– phonetically farther in other languages;

– some zoonyms:

– Italic: Latin *caper* 'goat'; Latin *fūcus* 'bee';

– Celtic: Irish *gabhar* [gawɜr], Breton *gavr*, Welsh *gafr*; Irish *foiche* 'wasp';

– close – Ancient Greek *σφήξ* 'wasp';

– differently in other languages;

– some numbers:

– Italic: Oscan *petuur* 'four'; Oscan **pumpe* 'five' (reconstructed from the Oscan *pumperias* 'fiver' [18, Meaning: five]), *pompe < pomperias 'fiver (people)' [33, p. 329];

– Celtic: Welsh *pedwar* 'four'; Welsh *pump* 'five';

– closely Germanic: Goth *fidwōr* 'four', Goth *fimf*, Old High German *fimf*, *finf*, *funf* 'five';

– differently in other languages.

These data let us suggest that IE dialects, whose areas were located in the vicinity of Transcaucasia (Proto-Italic, Proto-Armenian, Proto-Celtic and Proto-Germanic), had been in contacts with each other forming the southern (“Proto-Italic+”) subcontinuum of the IE dialect continuum. Pliny the Elder discovers the *Hali* tribe in the North Caucasus < и.-е. **sal-*/ *hal-* 'salt', compare with the Welsh *halen*, Old Corn *haloin* [4, p. 50]. At the same time, the ancestors of Italics territorially divided the ancestors of the Celts and the ancestors of the Germans (as in fig. and as Yu.K. Kuzmenko writes).

The reason for the integral displacement of the IE family towards the Semitic family in comparison with that of the Uralic one, discovered by A.G. Kozintsev [1, p. 154], is the adstrate connections of the languages of the southern IE subcontinuum with the languages of the Semitic family, which are much more noticeable than those of Finno-Ugric languages.

Indo-Aryans, having undertaken an ultra-long migration from the northern ancestral home to the south of Asia, also found themselves under the substrate influence of the Afro-Asiatic dialect continuum. One of the traces of this influence is the names for lion, just as in the north the names for bear were a trace of the Nostratic influence:

– Bantu: Swahili *simba*, Shona *shumba*, Zulu *insimba* 'lion', Xhosa *ingwe* 'leopard';

– Dravidic: Telugu *siṃhamu*, Tamil *ciṅkam*, Tulu *siṃha*, Kannada *siṃha*;

– Old Indian *singh* 'lion' < Sanskrit सिंह (*siṃhá*);

– Old Armenian ինձ (*inj*) 'feline predator', compare with Xhosa *ingwe* 'leopard'.

As for fluctuations [mb] ~ [ng(w)], compare:

– Latin *lingua* and Romanian *limbă* 'language';

– Latin *longus* and Urdu *ləmbə*, Hindi *lembe*, Gujarati *lambu*, Bengali *lomba* 'long'.

A detailed study of many IE names for lion and their etymologies, but without mentioning Bantu names among the external connections, see in [34].

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Western IE dialects-languages with unclear substratum influence.

The periphery of IE continuum speakers is closed by Proto-Balts and Proto-Slavs with their special for IE dialects term for ice **ledu*-, which is not a result of the substrate manifestation.

Besides that, Balts and Slavs have related and phonetically similar terms for:

– 'horn': ORus., OCS *рогъ* [rogъ] and Lith. *rãgas*, Latv. *rags*, OPrus. *ragis*;

– 'hand': ORus. *рука* [ruka], OCS *ржка* [rǫka], Pol. *ręka* and Lith. *rankà*, Latv. *rùoka*, OPrus. *rancko*;

– which are not common IE terms and do not represent any substratum layer.

The question about traces of contacts of Proto-Baltic and Proto-Slavic tribes with ethnic groups of Western Old Europe remains open, since descendant languages of these ethnic groups (Iberians, Aquitanian peoples, Ligurian peoples etc.) are known very fragmentary. Respectively, the influence of Neolithic farmers substrate upon Proto-Baltic and Proto-Slavic IE dialects remains unclear, unless we consider the original Slavic names for agricultural implements and for crops of the Eastern Mediterranean as this substrate.

Balto-Slavic variants of names for silver are reflected in Vasconic: *zillar*, *zirar*, *zidar*. In other Mediterranean languages, sets of phonemes similar to Old Prussian set are presented, but without *-l-*: Arabian *sarif*, Assyrian *sarpu* etc. [21, p. 104].

Let us note an old borrowing of the lexeme **meri* 'sea' from Proto-Balto-Slavic into Proto-Finnish, and Finnish names for fish into Slavic [35, p. 192–194]. The lexeme *rauta* 'iron', related to the Proto-Slavic **ruda* 'ore, iron ore', the stem of which (applied to metallurgy) is probably included in Sumerian *urud* and Vasconic *urraida* 'copper', borrowed from IE, reached also Finnish and only from Slavic languages. Another trace of Proto-Slavic-Sumerian contacts is seen in Russian *лохань* [lokhan'] ‘tub’ (and also East Slavic and Polish analogs) ~ Sumerian *laḫan gidda* 'long (or heavy) vessel' > Assyrian *laḫannu*, *laḫnu*, Arabian *laqan*, Aramaic *laqnā* 'pelvis, tup' [36, article “лохань”].

Names for salmon and eel had passed to Finno-Ugric from Baltic languages [10, p. 198], compare:

– Lithuanian *lãšis*, Latvian *lasis*, Old Prussian *lasasso* and Finnish *lohi*, Hungarian *lazac*;

– Lithuanian *ungurys*, Old Prussian *angurgis* and Finnish *ankerias*, Hungarian *angolna*.

In Tocharian languages the original Baltic meaning ‘salmon’ turned out to be eventually forgotten: in Tocharian B *laks* means 'fish in general'.

There are probable borrowings from Proto-Slavic IE dialect to Semitic languages:

– Proto-Semitic **gamal*- 'camel'; Middle Arabian جَمَل (*jamal*), Egyptian جمل (*gámal*), Hebrew גמל (*gamál*), Coptic *kamoul* from Proto-Slavic **gomolъ* 'hornless' (related to Russian *комолый*, Polish *gomoły*, Lithuanian *gãmulas* 'hornless'), with Slavic [o] > Semitic [a];

– Aramaic and Hebrew *galgal* 'wheel' from Proro-Slavic *kolo 'wheel' with reduplication, just like in many IE analogs with the meaning ‘wheel’, with Slavic [o] > Semitic [a];

– Arabian زَرَافَة (*zarāfa*) 'giraffe' from the Proto-Slavic **žeravь* 'crane' (Old Slavic *жеравль* [ʒeravl'] – 'big-necked', like *голавль* [golavl'] – 'big-headed).

Following Vasmer, we can note the relation of the Ancient Greek oronym *Καύκασος* 'Caucasus' with the Gothic *hauhs* 'high' and Lithuanian *kaukarà* 'hill' [36, article “Кавказ”].

Let us check traces of cultural proximity between ancestors of Balts and Slavs beyond the basic vocabulary.

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A number of names for horse in Proto-Baltic and Proto-Slavic languages-dialects form a special group of phonetically similar lexemes of Proto-Balto-Slavic subcontinuum, which could semantically flawlessly have been derived from **комолъ* [komolъ] 'hornless' [37]:

– Slavic: Old Russian, Old Slavic *комонь*, *кобыла*, Serbo-Croatian *кòбила*, Czech *kotoň*, *kobyla*, Polish, Low Lusatian *kobyła*;

– Baltic: Old Prussian *camnet* 'horse', Lithuanian *kùmė*, *kumẽlė* 'mare', *kumelỹs*, Latvian *kumeļš* 'foal'.

For people who had domesticated cattle, the absence of horns in two kinds of ungulates – horses and camels – was their essential distinguishing feature.

An alternative hypothesis is that a Wanderwort of eastern Iranian origin had spread around [25, Search: caballus], without explanation of the meaning of the source lexeme:

– Irano-Aryan: Khotan-Saka *kabä* 'horse', Persian کاول (*kaval*) 'non-pedigree horse';

– Latin *cabō*, *-ōnis* 'gelding', *caballus* 'horse';

– Ancient Greek *καβάλλης* 'workhorse';

– Celtic: Old Irish *capall*, Old Welsh *cefel*.

The presence of [p] in Old Irish *capall*, existence of the original forms in Iranian, Latin and Ancient Greek and of earlier names of the Altaic origin in Celtic languages indicate that the last group of lexemes were late borrowings from the common Slavic language, after the transition [m] > [b] in Slavic lexemes with the meaning ‘mare’ had already happened.

Let us note also lexemes denoting cattle, which are present in a number of IE languages northeast and southwest of Proto-Balto-Slavs:

– Anatolian: Hittite **guwau-* 'beef';

– Aryan: Old Indian *gāúṣ*, dat. *gávē*, авест. *gāuš* [18, Meaning: cow], Tajik *гов*;

– Slavic: Old Slavic *говѧждь* and other Slavic analogs;

– Baltic: Latvian *gùovs*;

– Armenian *kov* 'cow';

– Germanic: Old High German *chuo* 'cow';

– a separate group with the initial [b]: Greek *βοῦς*; Italic: Umbrian *bum*, Latin *bōs* (borrowed from Oscan-Umbrian); Celtic: Irish *bō* [36, article ”говядо”].

The given data let us assume that IE languages-dialects, areas of which were located in the Balkans and the Eastern Mediterranean (Proto-Slavic and Proto-Baltic languages), were in a tight contact with each other and with languages of the Northern Black Sea region and the Middle East, forming the western (“Proto-Balto-Slavic+”) subcontinuum of the dialect IE continuum.

Words for 'blacksmith', common to Baltic and Slavic languages, such as Old Prussian *autre* 'forge', *wutriis* 'blacksmith' and Middle Bulgarian and Serbian *вътрь*, the kinship of names for ancient metals in Baltic and Slavic, and common early IE specific names for items produced by blacksmiths (for example, sickles) speak in favor of the common origins of Baltic and Slavic blacksmith's terminology [21, p. 106].

Since the base for the formation of the Proto-Balto-Slavic community was the Balkan-Carpathian metallurgical province, in which lead, silver and copper were mined [8], it should be expected that the names for these metals were exported along with the metals themselves to neighboring ethnic groups that did not have these resources. Greatness of the area of distribution of the Proto-Balto-Slavic vocabulary may be associated with the monopoly of the BCMP in the field

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of copper trade in the territory from the Northern Black Sea coast to Anatolia in the 5–4 millennia BC. e. [38, p. 62].

The Proto-Baltic term for lead *(*w*)*olow*- (Old Slavic *оловo*, Serbo-Croatian *о̏ловo*, Polish *ołów*, High Lusatian *wołoj*, Lithuanian. *álvas*, Old Prussian *alwis* 'lead') spawned the Rhodes *βόλιμος* 'lead' [39] and Ancient Greek βούλλα (βοῦλλα) 'tin' ('κασσίτερος' [40]).

Names for silver in Slavic, Balto-Slavic, Baltic and Germanic languages are considered to have a common southern origin (Indian, from Old Indian *śubhrá*- 'beautiful, light coloured' [41, p. 79] or Semitic [21, p. 104]), the both versions bind areas of Proto-Balts, Proto-Germans and Proto-Slavs to Western Asia. Since the early metallurgy of silver was associated with the extraction of lead from sulfur compounds, where both metals have been met together [21, p. 36], there is reason to believe that Iranian names for lead (Middle Persian *srub*, Tajik сурб, Kurd *sirb*), and Proto-Slavic names for silver are related and derived from the Proto-Slavic name for sulfur (Old Russian *сѣра*, Serbian-Church-Slavic *сѣра*, Czech *síra*) using the suffixal extension -b- [39].

The common origin of names for silver and sulfur can be also seen comparing Old English *seolfor*, *sylfur*, Gothic *silubr* ‘silver’ with Sanskrit *śulbāri*, Old Latin *sulpur* ‘sulfur’.

V.V. Ivanov highlights the similarity of not only consonantism, but also of vocalism of Balto-Slavic forms with the late Anatolian forms such as Lydian *Σιβρος αργυρεος*, however, without giving any conclusion about the direction of the spread of this migration term [21, p. 104].

Ancient Greek terms of blacksmith craft, names for copper (*χαλκός* / Cretan *καυχός*), steel (*χάλυψ*, Ivanov writes about the relation of *χαλκός* and *χάλυψ*, however, he derives both names from the Hatti **haflki* [21, p. 98] > *ḫapalki*) and broken rock (χάλιξ) have Baltic etymology (compare Lithuanian *kalt*i / *kaut*i 'to beat, to forge' with *χαλκός* / *καυχός* 'copper') [42]. All these Greek names refer to different materials, the only thing that semantically unites them is corresponding technologies associated with hits (forging, splitting).

Baltic names for copper differ from Slavic ones due to the peculiarities of the division of labor in the BCMP: the places of copper ore mining and copper smelting did not coincide [43, p. 138–139]. Hence, a special group of original Baltic names for copper with the semantics of “meltness” [44, p. 48–50]: Old Prussian *wargien*, Lithuanian *varis* and Latvian *varš* – Proto-Balts were associated with copper smelting.

The monopoly of the BCMP (from the Northern Black Sea region to the Eastern Mediterranean), already mentioned above, leads to a suggestion that Hittite-Luwian names for copper *kuwanna* / *kuwanza* and the Ancient Greek *κύανος* 'azurite' have been derived from the lexeme **kovati* 'to forge' (compare with the Old Saxonian *hauwan* 'to forge', compare also with Novgorod *ковъ* [kov] 'copper'), and not vice versa.

The most common western name for bronze may also have a Proto-Slavic source:

– either the onomatopoeic **brę*-/**brǫ* (from which Russian-Church-Slavic *брѧцати*, Polish *brząkać* "to clink, to clangor", brzęczeć “to buzz” were derived); toponym *Βρεντέσιον* ‘Brindisi’ (13th century BC) of the Illyrian origin, famous for its bronze workshops (from which Persian *birinǰ* 'copper' were derived [36, article “бронза”]), can be interpreted in this case as 'clinking', remember also Venetian *Τεργέστε* 'Trieste' = Old Slavic тръговище 'marketplace';

– or extension of the root **bronъ*- with the semantics 'protection, armor' with the unproductive suffix -*z*-, like in *гомза*, *грымза*, *лобзать*, *ломзить*, *верзила*; *бронза* and *броня* are connected in this case semantically like *латунь* and *латы*;

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– or the same, but through Luwian-Sardinian mediation: **бронъ-* > Luwian **brunza* (like *кованъ* > Luwian *kuwanza* 'copper', but not vice versa, contrary to [45, p. 172]) > Sardinian *brunzu* 'copper'.

Lithuanian has preserved the original name of bronze. It was derived from Lithuanian *varis* 'copper' – *žalvaris* (lit. 'green copper'), which is semantically identical to Chinese *qīng tóng* 'green copper' [46].

Similarity of meanings and pronunciation of the following Ancient Greek and Lithuanian lexemes is also intriguing:

– between Lithuanian *laumė* 'witch' and Ancient Greek *Λάμια* 'Lamia, a monster in the form of a woman who sucks blood from people and devours them';

– between Lithuanian *laimė*, Latvian *laime* 'fortune, happiness' and Ancient Greek *λαιμός* 'throat'.

There are also toponymic evidences of the ancient presence of Proto-Balts and Proto-Slavs in the Eastern Mediterranean.

Ancient Greek toponym *Κύπρος* probably goes back to Proto-Slavic **kypeti* 'to boil, to foam' (Old Slavic *кыпѣти*, Czech *kypěti* 'to boil', *Cyprus* – 'foaming' is like Rus. *зубр* – 'toothy' < Rus. *зуб* 'tooth': let us recall the myth of the birth of Aphrodite (*Ἀφροδίτη-Κύπρις*) from sea foam in Cyprus [42], Ancient Greek *Ἀφροδίτη* < *ἀφρός* 'foam'). The names of the islands of Lesvos and Rhodes could also have been derived from the Proto-Slavic [5, p. 92; 42].

The Lemnos Island (Ancient Greek *Λῆμνος*) < **lom-*/**lem-* (from which also Russian *ломань* 'something beaten, broken', Polish *lemież*, Bulg. *лемéн* 'ploughshare' were derived), can also be added to the list of Proto-Slavic toponyms, since it had likely got its name because of the broken coastline. The etymology from Phoenician *lbn*, from Proto-Semitic **laban-* 'white' [25, Search: *Λῆμνος*], does not fit, since the island is composed of dark volcanic rocks.

For Thracian and Slavic traces in the Scythian lexicon, see [3, p. 68–144], for Proto-Baltic traces in the Prakartvelian lexicon see [3, p. 150–152]. For traces of contacts between Proto-Balto-Slavs and Hittites, see [47, p. 3–28].

The theonym *Mercurius* can also witness contacts of Proto-Slavs with Proto-Italics. Dumézil writes that its origin is unclear – [u] in *Mercurius* is confirmed outside Rome (the inscriptions *Mirikui*, *mercui* are also known), but in Roman Latin, there is only the stem *merx*. Hence the hypothesis that Romans had borrowed the name of this god [48, p. 579]. *Mercurius* 'Mercury', which was derived, according to Harper, "from merx "merchandise"... or perhaps from Etruscan and influenced by *merx*" [22, Search: Mercury], has a clear Slavic etymology. It is related to *мерек* [merek] 'ghost', *меркнуть* [merknut'] 'to darken', *мерекаю* [merekaju] 'I ponder', *морокую* [morokuju] 'I think', *мерцать* 'to flicker' (which is applicable to both mercury and the planet Mercury) – hence the Italic root **merk-*, and the Latin *merx* 'to trade'. Suffix extension can be either Slavic (like in Rus. *кожура* [koʒura]) or Latin (like in *centuria*).

Thus, Proto-Balto-Slavic subcontinuum was in contact with the Proto-Indo-Aryans, Proto-Anatolians, Proto-Italics, ancestors of Basques, Finns and non-IE ethnic groups of the Middle East.

Contacts between Indo-Aryan, Italic, Ancient Greek and Celtic proto-languages.

It is worth paying some attention to contacts between dialects of different subcontinua.

The contacts between Proto-Indo-Aryans and the Proto-Italics are manifested mainly in theonyms.

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Latin *Neptunus* and Old Irish *Nechtan* with the similar meaning [48, a footnote at p. 519], [49, p. 25] ~ Sanskrit *Apām Napāt* ‘son of waters’, the latter is a vedic deity of water and fire (hence also Persian نفت (naft) and Rus. *нефть* ‘rock-oil’), Avestan *Apąm Napāt* ‘descendant of waters’, the spirit of water. The acquaintance of ancestors of Aryans and Italics with oil probably took place in the North Caucasus, between the Black and Caspian Seas, where oil is readily available.

An alternative etymology directly from IE **nebh*- ‘wet’ does not cancel the mentioned contact between the ancestors of Aryans and Italics, adding to them ancestors of Anatolians and ancestors of Germans, who preserved this root and its original meaning, living in the neighborhood in Transcaucasia. Still the meaning 'descendant of waters' looks more logical, since Latin Neptune is similar to Ancient Greek Poseidon (Ancient Greek *Ποσειδῶν*, Dorian *Ποτειδᾶν*, 'lord of waters/rivers' from Old Indian *páti* 'master' and *dānu* “water, river”), which is more likely to be connected with the notion of power of water rather than with the notion of wetness.

In Sanskrit, Heavenly Father is द्यौष्पितृ (*dyauṣ-pitṛ*), whence both Ancient Greek *Ζεύς* ‘Zeus’ and Latin *Iūpiter* 'Jupiter’ derived. Not from a Greek or Latin prototype with the meaning ‘father’, since in the roots of these prototypes there is stressed [a], but not actual [ɪ].

We can also bring the Latin and Indo-Aryan names for eagle together: compare Latin *aquila* and Sanskrit चिल्लि (*cilli*) > Hindi चील (*cīl*), with the correspondence of Latin [k^{w}] ~ Old Indian [t͡ʃ], like in Latin *quattuor* 'four' ~ Ancient Indian *catúr*- 'four'.

Mythical Rhadamanthus (Ancient Greek *Ῥαδάμανθυς* – see a suggested etymology from Sanskrit below) lived in Crete, whose Latin name *Crēta* coincides with Latin *crēta* 'elevated'.

As to Greeks, borrowing the lexeme meaning 'island' indicates the remoteness of ancestors of Greeks from seas and their proximity to Celtic ancestors: comparison of Ancient Greek *νῆσος* 'island' (Dorian *νᾶσος*) with the Breton *enez*, Irish *inis* and Welsh *ynys* 'island' testifies to a Celtic source of the Ancient Greek lexeme – in original Greek words, the intervocalic IE consonant [s] should have disappeared. This is also evidenced by the absence of the original name for 'sea' in Greek: Ancient Greek *θαλασσα* is considered the trace of a substrate, which, in its turn, is phonetically close to Old Irish *talam* 'earth', Ancient Indian *talam* 'plain' and to Altaic words with meanings 'open space, open sea' [18, Russ. meaning: земля], for example, the Mongolian *далай* [dalaj] 'sea', the Buryat *мала* [tala] 'steppe' (as to semantic shift 'land' ~ 'water', compare Russian *прогалина* [progalina] 'glade' and *голомень* [golomen'] 'open sea', both with the root *гол-/гал-*). Ancestors of Greeks could be in contact with ancestors of Celts in the center of the IE dialect area, i. e., to the north of the Caucasus.

The Latin name for copper, *aes Cyprium*, is associated with a copper deposit in Cyprus, which does not allow us to consider Latins as autochthonous people of the Apennines, for whom the Balkans would be the closest source of copper. The first part of the name, *aes* 'copper, bronze', is phonetically close to Sanskrit अयस् (*áyas*) ‘copper, bronze' and Gothic 𐌰𐌹𐍆 (*aiz*) 'copper, bronze', which corresponds to imaging of the relations "Sanskrit-Latin-Gothic" of basic vocabularies in the fig.

Contacts between Irano-Aryan and Germanic languages.

These connections are of particular interest, in connection with the well-established belief about the absence of direct contacts between ancestors of Germans and ancestors of Irano-Arians.

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According to Kuzmenko, “the absence of exclusive Germanic-Iranian innovations indicates that Iranians were not direct neighbors of Germans, although Zebold assumes a period of Germanic-Iranian (Scythian) neighborhood, which, however, should be attributed only to the beginning of our era, when the common Germanic language had already disintegrated” [9, p. 93]. In our case, we mean the Proto-Germanic-Iranian neighborhood, related to the first half of the 1st millennium BC, and which could take place in the Transcaucasia and east to the Caspian Sea, that is, in the same place as the neighborhood with the Altaics.

Irano-Aryan languages, early separated from the Indo-Aryan ones, and Germanic languages demonstrate the following common features:

– Only Germans and Persians have dental suffixes for formation of past tense forms of verbs;

– Germans have "-n-" in one of the forms for plural, the same is in Persian and Semitic languages, and this feature is absent in other European languages;

– Germans have "-n-" in the suffix of infinitive, like in Hittite, Ancient Greek and Persian, and this feature is absent in other European languages.

There are also traces of lexical exchange between Germanic and Indo-Iranian languages, I will give a number of examples of lexemes with unclear etymologies, according to [22]:

– *anger* 'suffering', later – 'anger' (from Old Norwegian *angr* 'upset, regret') – Avestan *angra-* 'destructive, evil';

– *bad* – Iranian: Yaghnobi, Pashto *bad*, Kurdish *bed*, Talysh *bâd*, Old Persian and Armenian *vat* 'bad';

– *better* – Farsi *behtar* 'better';

– *best* – Farsi *behest* 'paradise (the best world)';

– *burden* (Old English *byrðen* 'load, weight, duty', Old Norwegian *byrðr*, Gothic *baurþei*) – Tajik бурдан [burdan] 'to carry';

– *steer* (Old English steor) – Avestan *staora-* “cattle”, Kurdish *stro*, Pashto *sutur* “bull”;

– *bag* (Old English *bagge*, not found in other Germanic) – Old Indian *bhaga* 'share, happiness, property', compare the Russian parallel *торба* [torba] 'bag' и *тороватый* [torovatɨj] 'lucky';

– *path* (Old English *paþ*, *pæþ* 'path') – Avestan *patha* 'path';

– German *Höhe* "height" (Old Saxonian, Old High German *hoh*, Gothic *hauhs* 'high' – Ossetian *хох* [khokh] and Tajik *кух* [kukh] 'mountain';

– Swedish *kvarn*, Islandic *kvörn*, Old English *cweorn* – Ossetian *куырой* [kwɨroj] (all meaning 'mill').

Traces of contacts between Germans and Scythians (are believed to be an Iranian-speaking group of tribes) are suggested by V.I. Abaev who derives the name of a Scythian tribe *Σκύθης*, which invaded Asia Minor, from the Germanic form **skut* ‘shooter, to shoot’ [50, p. 25]. We also believe that Scythian-Germanic contacts took place precisely in the vicinity of the Caspian Sea, including the Transcaucasia.

The listed peculiarities correspond to the ancestral area of Germans, i. e., people who spoke Proto-Germanic language, between ancestors of Irano-Aryans and Semitic peoples. That is, in the area, in where historians placed Germani, Aryans-Medes (Herodotus), Uti and Guti – counterparts of the actual Germans-Tungri, Harii (Tacitus), Jutes and Goths (the latter people called themselves *gut-thiuda*, and their language – *tugga* [tuŋga]).

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North Black Sea region – Asia Minor: migration of "Proto-Indo-Hittites".

Temarunda, the "Scythian" name of the Sea of Azov, given by Pliny the elder, at first sight, contains the root of the Hittite lexeme 'sea'. However, according to Trubachev, the Pliny's *Temarunda* could be given to the Sea of Azov only by Sindi and Maeotians. He read this name, which was considered unclear until that, as **tem-arun-da* 'nurse of the Black Sea'. He saw a correspondence to **tem-* in Old Indian *tamas* 'darkness', a correspondence to **arun-* in Old Indian *arna-* 'abyss' and Hittite *aruna-* 'sea', but the combination **tem-arun-* 'black, dark sea' was recognized by him as "exclusively Indo-Aryan, Proto-Indian (in Iranian, 'sea' has a different designation, and in Hittite, dark color has a different designation). We will explain the final *-da* by the IE **dhe-* 'to breastfeed', known in various Indo-European languages, compare, for example, Kurdish *da* 'mother'" [41, p. 69].

Hittite traces in the Northern Black Sea region are not limited to the name of the Sea of Azov. O.N. Trubachev notes the following "Hittite-North-Pontic isoglosses, for example, *Antissa*, compare the Hittite *hantezziia-* 'first, front', *Артек* [artek], compare the Hittite *hartagga-* 'bear' (compare with the Turkic name *Аюдаг* [ajudag] 'Bear mountain', mentioned by the author above, – my note, G.T.), the component *-σαρα* in final of Bosporian female personal proper names and the analogical *-šar*(*a*) in Hittite names for women" and "Hittite *ḫaššušara* 'queen', *išḫaššara* 'mistress', Middle Sindi *Καμασαρυη*" [41, p. 71]. The author rightly asserts that the Greek name of the bear has nothing to do with Artek just like the Indian one, but he did not dare to consider it Hittite in origin. The "bear" traces of Hittites are found from the Taurida to the Balkans: a place in the Taurica *Ψευδαρτάκη* "false Artaka" (in Partenit, modern Artek), further – to a Thracian tribe near Nikopol on Istra Ἀρτάκιοι, to a Pelasgian city on the Dardanelles *Ἀρτάκη*, to a Pelasgian city and mountain *Ἀρτάκη* on the Cyzicus peninsula in Asia Minor [1, p. 74].

The disagreement could be resolved if it was assumed that the R1a dialects of the IE continuum were not differentiated by the 3rd millennium BC to a degree that there could be well distinguishable Proto-Aryan and Proto-Anatolian languages. In other words, the hydronym *Temarunda* could have been produced by this undivided community. The isolation of the Anatolian group of languages from it, most likely, occurred in Anatolia itself, where the "Indo-Hittites" (Pelasgians?) entered into contact with speakers of non-IE languages of Anatolia and Transcaucasia and split into Anatolians (in Asia Minor) and Aryans Mitanni (in Transcaucasia). This explains, in particular, the form of the Hittite toponym *Purushanda* clearly related to the Sanskrit *puruṣatā* 'masculinity' and *Puruṣa*, the name of the divine spirit.

A specific group of lexemes for 'horse' also indicates close contacts between Anatolians and Aryans, whose names for horse are very similar, compare:

– Anatolian: Hittite *aś*(*u*)*was*, Luwian cuneiform *azzuwas*;

– Aryan: Ancient Indian *áśva-* m., *áśvā* fem., Avestan *aspa-* m., *aspā* fem., Ancient Persian *asa-*.

Names for 'horse' related to the above ones were borrowed into some Caucasian languages and IE dialects of Eastern and Southern subcontinua (with greater phonetic distortion):

– Hurrian *ešše* 'horse' > North Caucasian: Kabardian *шы* (šə), Abkhazian *а҂еы* (āčə), Lezgin *шив* (šiv), Karata *ичва* (ičʷa) 'mare';

– Old Armenian *ēš* 'donkey';

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– farther – Italic: Latin *equus* m., *equa* fem.; Tocharian: A *yuk*, B *yakwe*; Ancient Greek *ἵππος*, dialect *ἴκκος*; Celtic: Old Irish *ech*, Old Welsh *eb*; Germanic: Old English *eoh*, Old High German *eha*-, Old Norwegian *jōr*, *ehwu* (runic);

in Western subcontinuum, they reached only the ancestor of Lithuanian, which had contacts in Asia Minor:

– Lithuanian *ašvà* 'mare', dialect *ešvà*.

The starting point of "Indo-Hittite" migrations to West Asia and India was in Northern Black Sea region, artifacts of Indo-Aryan origin, dating back to the 3rd millennium BC, are being found in the catacomb sites of the Northern Black Sea region and the Ciscaucasia [2, Ch. II].

The migration of "Indo-Hittites" to Asia Minor could have taken place using two paths: a) through the Caucasus and b) through the Balkans and islands of the Eastern Mediterranean.

Using the first way Aryans could come to the kingdom of Mitanni [8, p. 242], entering into interaction with native speakers of Caucasian languages, especially, of its western part (with Abkhazian-Adyghe and Georgian-Zan vocabularies) [3, p. 208–209, 215–216].

The second way, through the Balkans and the islands, left traces, besides the "bear-mentioning" Hittite ones (see above), in the form of the names of two mythical Cretan brothers:

– *Ῥαδάμανθυς* 'smb planning success?' – compare Sanskrit *rādha*- 'prosperity, success' and *máti* 'thought, mind, intention, memory' < *man* 'to think' (compare also related Ancient Greek *μανθάνω* 'to learn, to understand'); the myth of Rhadamanthus says that he gave Crete the laws;

– *Σαρπηδών* 'snake tooth?' – compare Sanskrit *sarpá*- 'snake' and *dán* 'tooth'; the myth of Sarpedon says that he fled from Crete to future Lycia (west of Asia Minor), where they started speaking Lycian, the language of the Anatolian group: this is the mythological reflection of the transformation of Proto-Indo-Hittites into Proto-Anatolians.

From Asia Minor – to Southern Europe: migration of "Proto-Celto-Italics".

Some toponymic and historical evidence prompt direction of migrations of some ancestors of Italics, see for more details [51, p. 274–275]:

– the capital of Lydia Sardis (Ancient Greek Ionic *Σάρδεις*) and the island of Sardinia (ancient Greek *Σαρδώ*, the inhabitants are Sardis people) may be related to the Sherden people (Šrdn), one of Sea Peoples; the northern Sardis people are close to the P-dialects (with *limba* for 'language'), the southern ones are close to the Q-dialects (with *lingua* for 'language');

– toponyms Sagalassos (*Σαγαλασσός*) in Pisidia and Sicilia (the inhabitants are Sicules) can be related to the Shekelesh people (Šqrš), another one of Sea Peoples; the language of Sicules, according to Terence Varro in De lingua latina, was almost the same as Latin;

– Romans considered themselves descendants of Trojans who fled from burnt Troy, their patrician clans tracing their origin from Aeneas, a Trojan hero;

– according to Herodotus, the name of the Thracian tribe *Bryges* (*Βρίγες*) had changed after their migration to Asia into *Φρύγες* – this corresponds to Italic innovation *bh- > (β-) > f-.

Proto-Celto-Goidel migrations were, perhaps, only evidenced by the semi-mythological "The book of the taking of Ireland" [52] (or "The Book of Invasions"): Maeotian swamp, Scythia, Egypt, Crete, Sicily, Tyrrhenian Sea, Spain, Ireland. As for the ancetral home of Goidels, they came from the mountains of Armenia where they were called Iberians [52, p. 48, 49]. Despite the understandable distrust of historians to this source, its information correlates both with celtogenesis near the Caucasus, according to the results of our study, and with historical

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Celtiberians in the Pyrenees. Ancestors of the P-Celts, judging by the Britt name of the Apennine Peninsula (from *pen* 'peak'), came to Europe by the similar route (just like P-Italics: Oscan and Umbric people).

From the Eastern Mediterranean – to North of Europe: migration of "Proto-Balto-Slavs".

Venetian *Τεργέστε* 'Trieste' relates to Proto-Slavic **Тържиште* (compare Serbian *тржиште* [trʒi̯ʃte], Old Slavic *тръговиште* [trъgoviʃte] 'marketplace', Russian toponym *Торжок* [torʒok] 'small marketplace'); Etruscan 𐌅𐌄𐌋𐌆𐌍𐌀 (*velzna*) 'Bologna' relates to Latvian *valgs, valgans*, dialect *vę̃lgs* 'wet', similarly Latin *Bolonia* 'Bologna' relates to Old Russian *болонье* [boloɲje] 'floodplain' (in connection with the floods of the Reno River, flooding the lowlands), Latin *Reno* 'Reno' obviously relates to Old Russian *рень* 'shallow' (compare with Boulogne and Rhine (Lat. Rhēnus) with the same etymologies / similar properties), Ancient Greek *Ἴστρος* 'lower course of the Danube' relates to Baltic names of rivers, settlements in the north of Eastern Europe etc. [53, p. 117–118]. Just as the "bearish" toponyms and ethnonyms of Proto-Hittites marked the routes of their migration from the Northern Black Sea region to Anatolia (see above), the above toponyms show the direction of migration of Proto-Balto-Slavs: from the Eastern Mediterranean to the north of Europe.

There are reasons to believe that the Scandinavian Bronze Age at the beginning of the 2nd millennium BC with the same themes of products, but with better quality than the synchronous products in the south of Europe, is associated with migrations of Proto-Slavs to the north of Europe [6].

Conclusion. The hypothesis of IE dialect continuum in Circum-Pontic region at the time of Early Bronze and the relevant linguistic data (Swadesh lists, especially – lexemes meaning 'ice', 'horn', 'hand (palm)', plus lexemes with the meanings: 'predator (bear, lion, etc.)', 'cattle (bull, ox)') permit to identify in the supposed IE dialect continuum the core of four proto-dialects with noticeable amounts of pairs of understandable basic lexemes – Proto-Baltic, Proto-Slavic, Proto-Aryan and Proto-Italic – and four partially superimposed dialect subcontinua:

– Balto-Greco-Aryo-Tocharo-Anatolian subcontinuum – to the north of the Black and Caspian Seas and the Caucasus, neighboring with Uralic and Altaic languages;

– Tocharo-Celto-German subcontinuum – to the north, east and south of the Caspian sea, neighboring with Uralic, Altaic and Austronesian languages;

– Germano-Celto-Italo-Greco-Armeno-Baltic subcontinuum – in the Caucasus and in the Transcaucasia, to the south of the Black and Caspian Seas, neighboring with Afro-Asiatic and Austronesian languages;

– Balto-Slavo-Italo-Aryan subcontinuum – in the Balkans and the Eastern Mediterranean, neighboring with Finno-Ugric and Semitic languages (the issue about Old European neighboring languages and/or substratum of Old Europe remains uncertain).

The location of the area of "Proto-Balto-Slavic+" subcontinuum is attached to the former Balkan-Carpathian Metallurgical Province, i. e., to the area from the Carpathians to the Eastern Mediterranean, and this is the western periphery of the IE dialect continuum area and the source of some linguistical influence for the nearest speakers of the continuum, judging upon the data of figure and terms of mining and metallurgy. This is a more or less reliable benchmark. Above, we also came to the conclusion that the "Proto-Balto-Slavic+" subcontinuum was adjacent to the "Proto-Aryan+" one in the northeast, and to the "Proto-Italic+" subcontinuum of the IE dialect

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continuum in the southeast. The intermediate location of Proto-Balto-Slavs between Proto-Aryans and Proto-Italics resulted, for example, in names for cattle / bulls:

– Hitt. **guwau-* 'beef' [18, Meaning: cow];
– OInd. *gāúṣ*, Avest. *gāuš*;
– OCS *говѧждь*; *моуръ*;
– Latav. *gùovs*; Lith. *taũras*;
– Lat. *taurus*.

To clarify the relative position of Proto-Celts, Proto-Germans and Proto-Italics of the southern subcontinuum and Proto-Balts and Proto-Slavs of the western subcontinuum, let us use the data of the analysis made by Yu.K. Kuzmenko. Under ‘lived’ below we will understand ‘settled’ and/or 'roamed'.

Since the Slavo-Germanic innovations are less in number than the Balto-Germanic ones, and all the Slavo-Germanic innovations are present in Baltic languages, while Baltic languages have a number of innovations common with Germanic languages, which are absent in Slavic [9, p. 97–98], the ancestors of Balts lived for a long time between the ancestors of Germans and the ancestors of Slavs (which corresponds to figure).

Since the Celto-Germanic innovations are less in number than the Italo-Germanic ones, and all the Celto-Germanic innovations have analogs in Italic languages, while Italic languages have a number of innovations common with Germanic languages, which are absent in Celtic [9, p. 97–98], the ancestors of Italics lived for a considerable time between the ancestors of Germans and the ancestors of Celts (and this corresponds to figure as well).

Since Proto-Celts, having contacts with the Proto-Italics, adopted part of the Uralic and Altaic vocabulary, the ancestors of the Celts should have lived in the wide area from Asia Minor to the southeast coast of the Caspian Sea south of the ancestors of Italics, including the vicinity of Mesopotamia.

To the northeast of “Proto-Balto-Slavic+” subcontinuum, there was the area of native speakers of “Proto-Aryan+” subcontinuum. The Proto-Aryan language was the language of nomadic pastoralists [54, p. 275 ff], in contrast to the language of Proto-Slavs with a developed complex of agricultural terminology. Judging by the above-described features (morphological traces in the pre-Greek substrate, toponyms, ethnonyms, names of mythological characters), one of the migration routes of “Indo-Hittites” to Anatolia passed through the BCMP (what probably led to the crisis and disintegration of the province). Proto-Irano-Aryans, occupying the vacated space, came into contact with the Finno-Ugrians in the second half of the 2nd millennium BC [8, p. 241–242], what suggests the following structure of the northern subcontinuum: Proto-Indo-Aryans and Proto-Anatolians (closer to the north and west), Proto-Iranian-Aryans and Proto-Tocharians (closer to the south and east).

At this stage it is clear that Proto-Tocharians and Proto-Irano-Aryans in the Early Bronze Age lived farther to the east / northeast from Proto-Slavs than other proto-ethnic groups.

At the eastern periphery of the IE dialect continuum, the “Proto-North-Germanic+” subcontinuum is located. German component of this subcontinuum differs from that of the southern subcontinuum by a greater share of eastern borrowings remaining in English and Scandinavian languages, in particular, Altaic names for 'horse'. The remoteness from

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the consolidating influence of the CPMP delayed the structurization of this part of IE continuum, as a result of what, on the eastern periphery, the interactions of Proto-Iranian, Proto-Germanic, Proto-Celtic and Proto-Tocharian dialects with each other and with the Altaic and Proto-Finno-Ugric dialects remained.

The proposed geography of IE dialect continuum is supported by the fact that traces of contacts between opposite peripheral subcontinua are observed only in the meridional direction. This best corresponds to the IE area around and between the Black and Caspian Seas with early contacts between the Proto-Aryans and Proto-Greeks, Proto-Celts and Proto-Italics to the north and south of the Caucasus, and to the absence of early contacts between Proto-Germans and Proto-Slavs.

In the 2nd millennium BC, crisis phenomena in the CPMP occurred, and many ethnic groups started to move. A significant part of Proto-Slavs and Proto-Balts migrated to the north and west of Europe (Veneti, Wends, Ruthenians), displaced by the ancestors of the Greeks, Celts and Italics. As a result of the departure of the bronze masters to the north in northern Europe, the Scandinavian Bronze Age began with the same themes of products, but with better quality than synchronous products in the south of Europe [55, p. 79, 97].

Probably, this was the time of the final of the Multi-Cordoned Ware culture (22nd–18th centuries BC), the inhabitants of which, having mastered the light horse chariot, dispersed at the beginning of the 2nd millennium BC in three directions: eastern direction – towards South Ural, India, Iran and, possibly, North China; western direction – to Balkans, Greece, Asia Minor, and the southern one – to the Near East: Anatolia, Mitanni, to the Arabian Peninsula [13, p. 147]. Indo-Aryans came to India, Mycenaeans came to Hellas [2, Ch. VII], Hurrians began expansion to the southwest (which coincides in time with the invasion of the Hyksos into Egypt: the capital of the Hyksos *Avaris* < Hurrian *awari* 'field'?).

The ancestors of Germans came to Europe last, in the course of the Scythian-Sarmatian expansion, settling between Balto-Slavs on the one side, and Celts on the other side (bringing with them specific names for horses) [6; 56].

As a result of all this restructuring, the transformation of IE dialect continuum into a common IE proto-language had not been completed. This is a reason, in particular, of the absence of a common paradigm of declension, which A.V. Desnitskya writes about [57, p. 76], and of the doubts about the necessity of the hypothesis of a common IE proto-language, the divergence of which could lead to the observed set of IE languages [58, p. 65 ff]. Ethnic groups, occupying new habitats, were substrate-influenced by the aborigines, partially mixed with each other, created statehood, and as a result, IE languages close to the modern ones appeared.

The representation of the Proto-Indo-European areal in the form of a dialect continuum solves a number of difficulties inherent in the most common model of a single original IE proto-language. Due to the initial extension of the areal (the area between the Alps and the Urals, the Middle East and the forest zone of Europe), attempts to find common Indo-European nature terms are doomed to failure. The IE languages were appearing, on the one hand, as a result of convergent phenomena in the IE dialect continuum due to cooperation, and on the other hand, as a result of divergence of the languages due to loss of contacts of their native speakers with each other, and interactions of the IE dialects with various substrates during migrations in various directions.

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