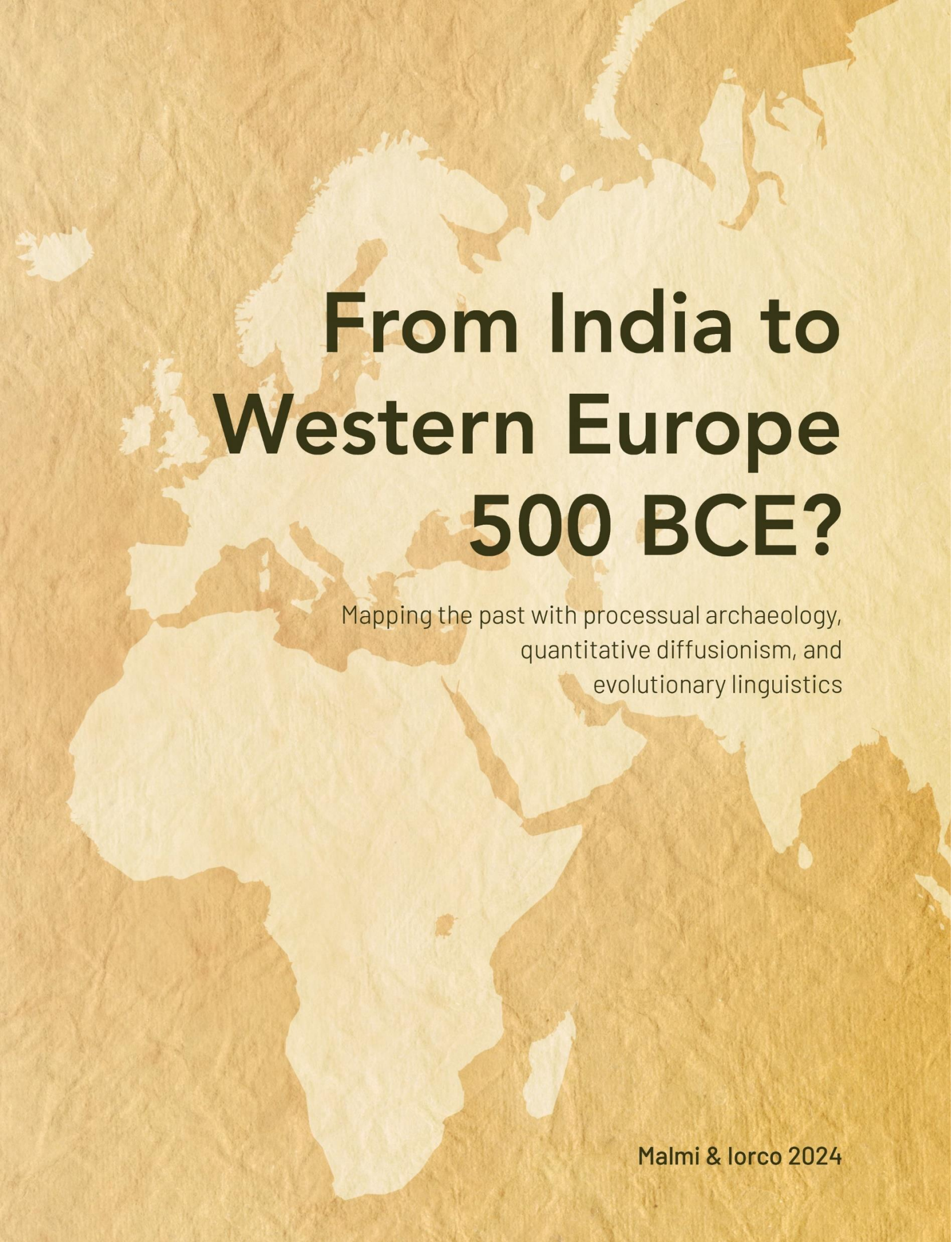




From India to Western Europe 500 BCE?

Mapping the past with processual archaeology,
quantitative diffusionism, and
evolutionary linguistics

Malmi & Iorco 2024

Pasi Malmi & Tommaso Iorco

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Cover: Aino Aulanko

Key words (YSO): Migration of peoples, diffusion, prehistory, ancient times, genes, memes, onomastics, linguistics, cultural evolution, Indians (Asians), Berbers, Celts, Etruscans, Irish people, Phoenicians, Kalevala, Nordic mythology

Key words (uncontrolled): Indus Valley, urheimat, Indigetes, Sea People, Hyksos, Mitanni, Libu, Kushite, Old Norse

Person key words: Richard Dawkins, Jürgen Habermas, Homer, Herodotus, Philostratus, Pliny the Elder, Diodorus Siculus

Location key words: Indus Valley, India, East Africa, West Africa, Maghreb, Iberia, Italy, British Isles, Baltic, Karelia, Volga

ISBN: 972-952-69579-9-9

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Abstract

According to this study, one or more cultures of the Indian Subcontinent disseminated genes, words, names, symbols, customs, and artefact styles towards Western Europe 3000–50 BCE. One possible route for the diffusion of influence would have been the Mediterranean Sea. This route is supported by historical sources, according to which there was a canal that connected the Red Sea to the Nile sporadically 1850–50 BCE, and according to which some Indians had sailed to Germania ~60 BCE. Historical sources also report *Indigetean* (Indian?) colonies in northern Iberia. In addition, there are lexical similarities between the Basque language and the Dravidian languages, indicating the migration of loanwords from India to Iberia, although the descent of words from an unknown proto-language is also possible.

All of these findings, however, can also be explained by migrations from India to Western Europe via the sea route around Africa. According to archaeological evidence, this route advanced from India to East Africa 3000–2500 BCE. Based on the Genetic Atlas of Human Admixture History there would have been migrations between India and East Africa 3000–1900 BCE and from the coasts of the Indian Ocean to Namibia ~850 BCE, Morocco ~710 BCE, and Western Europe 710–38 BCE. This route matches with Philostratus according to whom the Indians founded 60 cities to Sub-Saharan Africa 1550–1070 BCE. In addition, the migrations around Africa are supported by linguistic data, according to which Dravidian loanwords and linguistic features seem to have migrated to East Africa at the beginning of the first millennium BCE and to West Africa at some point of time 3000–500 BCE. After these migrations, an

Indian colony still existed at the Atlantic coast of Sub-Saharan Africa ~50 BCE, according to Juba of Numidia. The connection between India and West Africa is supported by the similar HLA genes of the Nadar (southern India) and the Fulani (West Africa).

At the next phase of this study, 11 hypotheses of the India–Africa–Europe theory were tested and evaluated against the onomastic data that was obtained from Mapcarta.com and Forebears.io. The research data, which covered 26 name sets and 1247 names, provided support for the migrations from India to the coasts of the Atlantic Ocean around Africa. The calculated urheimat of the Ancient West African, Berber and Libu, and Iberian name sets was located to the India–Nepal–Sri Lanka region. In addition, several name sets revealed tentative migration paths from India towards Western Europe via West Africa. Similar supporting evidence was not found for the India – Mediterranean – Western Europe route.

The theoretical foundation of the study was processual archaeology and systems theory, memetic discourse analysis, and evolutionary linguistics. On this basis, the first chapters of the book constructed a general theory of cultural evolution and some improved quantitative methods for analyzing the similarity, change, and migration of artefact styles, words, names, symbols, customs, ethnic sets, lexicons, and ideologies. A special case of cultural evolution is the evolution of names: According to this study, names can survive for millennia if they diversify into several languages, cultures, and stories in such a fashion that local phonological changes will not cause the extinction of the original name on a global scale.

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Foreword

This book is a result of a three-year long project founded by the Media Industry Research Foundation of Finland. During the project, several draft versions of the text were published for feedback and commentaries, in line with the principles of Agile Publishing. The first version published as monography was *Atlas and Herakles* (Malmi, Iorco, Brohi, and Pal 2022). Based on the review comments received, the content was then split into two parts in January 2023. This current book is a completely re-edited version of its first part and focuses at the Dawkins-Habermas theory of cultural evolution and at the India–Africa–Europe theory. The second part, which has not yet been published, will re-interpret old traditions, legends, and stories such as Jason and the Argonauts and Plato’s story of Atlantis based on the methods that are presented in this book.

A central part of the Agile Publishing concept is relying on peer review as quality assurance of the content to be published. In the beginning of the project, the first peer review was made by geneticist N.N. based on the traditional anonymous peer review process. During the project, Agile Publishing moved to an open peer review process in which the identity of the reviewers is made public. I wish to thank all the peer reviewers and commentators for their contribution, as thorough and voluminous review comments are so crucial to the quality of any scholarly publication.

Esko Clarke-Sario

CEO 2020–2022 and Member of the board 2023-2024

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1 Basic concepts and principles of the DH theory of cultural evolution

1.1 Objective and structure

The objective of the first three chapters is to present a synthetic theory that will make it possible to understand, predict, measure, and infer cultural evolution that occurs within human families, groups, communities, societies, and civilizations. This theory, which is named here as the *DH theory*, is based on the works of Dawkins (1976), Hull (1980), Habermas (1984), and Malmi (1988, 1992, 2009, and 2021). It connects to the *Cultural Virus Theory* of Cullen (2000) and to the *memeplex theory* of Blackmore (2000), but it was developed earlier. The DH theory integrates processual archaeology and systems theory to diffusionism, discourse analysis to quantitative memetics, and usage-based linguistics to improved lexicostatistics.

Although the foundation of the DH theory has been laid by the writings of Malmi (1988–2021), this chapter presents the principles and key concepts of the theory in a more complete form and with more focus on archaeology, linguistics, genetics, Bronze Age, and Iron Age than the previous works of Malmi. The chapter starts with the general concepts and principles and then proceeds to the detailed predictions concerning cultural evolution. It also acts as a necessary foundation for the more precise models and methods that relate to the diffusion of cultures, languages, words, and genetic markers. These models and methods are described in chapter 2–3.

This chapter has dozens of connections to processual archaeology, discourse analysis, and usage-based linguistics. Yet, these connections are not explicitly pointed out, as they should be identifiable for all postgraduate scholars of archaeology and linguistics.

1.2 Interactors, replicators, and the general principles of evolution

In order to understand socio-cultural evolution, it is necessary to understand some general principles of evolution, which are applicable to all populations of biological and social systems. This chapter presents such a general theory, based on the contributions made by the several geneticists, biologists, sociologists, economists, and organization scientists.¹ In addition to the usage of old, conventional concepts, this chapter presents some new definitions for existing concepts, and some entirely new concepts. When an existing concept has been given an altered meaning, the first letters of the used concepts are written in capital, which indicates that the concept has a specific, non-standard meaning is in the DH theory.

Central concepts

According to Hull (1980), all living systems evolve based on environmental selection, which is targeted to replicators and interactors. *Interactors* are living beings (or systems) that interact with their environment in order to maintain their steady state or in order to grow, spread, change, and diversify.² Examples of interactors include plants, animals, and humans, and *social interactors* such as families, organizations, communities, nations and civilizations.³ According to Hull (1980), *replicators* are information entities that replicate themselves with the help of the interactors. Examples of replicators include organic replicators like genes and viruses, and cultural replicators such as words, beliefs, stories, values, rituals and technologies.⁴ Dawkins called the replicators as *replicants*. He depreciated the interactors by presenting them as *carriers* or *copy-machines* of replicants (Dawkins 1976). According to his approach, the fitness and survival

¹ E.G. Buckley (1967), Dawkins (1976), Miller (1978), Hull (1980), Nelson & Winter (1982), Gould (1982), Aldrich & McKelvey (1983), Cooper (1984), and Malmi (1988–2021).

² Buckley (1967) called the steady state as *morphostasis*, and the growth, change and diversification as *morphogenesis*.

³ Miller (1978) created a larger list of interactors of different levels, but he called them as *living systems*, not as interactors.

In archaeology, human interactors are called *actors* or *agents*, and they may have smaller or greater *agency* (Renfrew & Bahn 2012, chapter 12, and Murphy & McSparron 2019).

⁴ Within the diffusionist tradition of archaeology, *innovations* were perceived as replicators. Even within the practice theory, traditions are sometimes perceived as replicators that agents replicate and potentially alter (Harris & Cipolla 2017, 47).

of the carriers is relatively insignificant for the replicants, which are the central units for understanding evolution. In the DH theory, the term *replicator* is used as the preferred synonym of *replicant*, and the term *interactor* is used in the way Hull defined it. In the DH theory, the term *Carrier* refers to the interactors, ecosystems, and regions, which carry replicators. In addition, it is possible to perceive replicators as Carriers, when they carry other replicators. Chromosomes, for example, carry genes. Artefacts can carry artefact styles, and cultures tend to carry languages, which carry words.

Variation, selection, and retention: According to Hull (1980), Nelson & Winter (1982), and Aldrich & McKelvey (1983), evolution is a universal process that appears in all interactor populations, including biological populations and the populations of organizations and enterprises. According to this approach, the driving forces of evolution are *variation*, *selection*, and *retention*. Variation of the replicators causes variation to the biological and social systems that carry them. Selection is the force, which roots out those interactors that are less competent than others are, and at the same time roots out those replicators that are correlated with lower competence. Selection may also operate at the level of the ecosystems that host interactors. In this case, natural selection may root out those replicators that cause interactors to destroy their ecosystem.

Retention is the process, in which the replicators, which increase the growth, longevity, and fecundity of their carrier interactors, fill the space that was released by the deceased interactors. For example, if there are two alternative technologies that enterprises use for making radios, and the other one produces better and cheaper radios, then the companies that focus on the inferior technology will have a higher risk of bankruptcy than their rivals. The more competent companies will then fill the market space released by the bankrupt companies. This will increase the relative frequency of the more competitive technologies in the population companies that produce radios.

Alleles are generally defined as alternative genes that may occupy the same position in a chromosome.⁵ They are a conceptual tool for recognizing and measuring variation and competition at the level of replicators. In the DH theory, *Alleles* are defined as *relatively similar alternative replicators that coexist in the same functional or structural environment and therefore compete against each other*. This means that genes that occupy the same position are alleles. However, it also means that competing words (synonyms), competing sounds, and competing variants of a proverb are Alleles. The Alleles of a replicator include its mutated versions, which are often harmful and short-lived, but sometimes more competitive than their source replicator. Dawkins (1976) gives an example of this. According to him, a translation error converted *maiden Mary* to *Virgin Mary* in the early evolution of Christianity and the new variant gradually replaced the earlier one.

Alternative vowel phones, for example, compete against each other when people try to pronounce a word, as the word has a fixed structure, in which the vowel may fit only in a specific place. If a story has a clear structure, then the name of the protagonist occupies a specific position in the story. This means that the name of the protagonist competes against alternative names that can fill the same place. An example of competition within the same *function* is the competition of alternative anthroponyms when parents decide the name of their newborn child. When variants compete against each other, the competition is often dimensional and appears between attribute–value pairs. An example of this is the competition of the short vowels against longer variants in the pronunciation of words.

Markers are sets of interconnected replicators that do not appear together due to random emergence, and therefore, can be used as clear indicators of the movement or descent of a replicator from one Carrier to another. Genetic markers are groups of genes that are located so close to each other in the chromosome that they tend to be inherited as an entity. This same applies to other kinds of markers,

⁵ Britannica, "[Allele](#)".

such as those chemical trace elements that can be used as fingerprints for identifying the geographic origin of ancient metal objects.⁶

Haplotype is a genetic marker that is inherited from a single parent,⁷ and *haplogroup* is a group of similar haplotypes that share a common ancestor with a single-nucleotide polymorphism mutation. Each haplogroup *originates from* and *remains part of* a preceding single haplogroup (or paragroup). As such, any related group of haplogroups may be modelled as a nested hierarchy, in which each set (haplogroup) is also a subset of a single broader set. For example, the haplogroup M1c is a part of the wider haplogroup M1. An analogical concept to a haplotype in linguistics would be the vocabulary that relates to a specific innovation (e.g. sailing or iron metallurgy). Although languages tend to inherit words from several other languages, the vocabulary that relates to a specific innovation is usually inherited from one single parent language.

Fitness was originally defined by Darwin as the ability of various kinds of animals and plants to survive and create viable offspring, and as the ability of species to compete against rival species.⁸ During the 20th century, geneticists started to define the fitness of a gene as the *observed increase of its relative frequency in the gene pool*. This genetic concept of fitness could be extended to all replicators, defining the fitness of a replicator R as its increasing relative frequency. The problem of this definition is that it measures evolutionary success, but does not tell anything about the success factors that caused this success. Cooper (1984) intended to resolve this problem by defining the fitness of a gene as its *expected time to extinction*. This definition seemingly talks about a success factor (expected time to extinction), but it is still just talking of the outcome of evolution (extinction vs. survival), and not about the success factors that lead to survival.

Longevity, fecundity, and fidelity are the central success factors of replicators⁹ according to Dawkins (1976). Short-lived replicators, which lose their structure and information content easily, cannot survive long enough to make many copies of themselves. If the fecundity of a replicator is low, the replicator produces copies of itself at a low speed, leading to low success. If the fidelity of the replicator is low, then a high percentage of the copies are corrupted, meaning that the replicator was not replicated. For example, if a rumor is not attractive enough, its fecundity will be low. If the rumor is complicated and hard to remember, then its fidelity will be low, and it will produce many mutated variants.

The problem of Dawkins's model is that it pays very little attention to the success factors of interactors. This defect is fixed in the DH theory by defining *growth rate, longevity, and fecundity* as the success factors of interactors (see Malmi 2009, 60). Behind all of these three success factors are other underlying success factors, such as ability to collect and store resources, ability to repair or replace dysfunctional parts, and ability to produce offspring by sexual reproduction, asexual reproduction, or by fission.¹⁰ Another problem of Dawkins's model is that it does not pay enough attention to the ability of interactors and replicators to move to new environments. Such an ability is crucial for long-term survival, as staying in one single environment or environmental niche will put replicators and interactors at the risk of extinction that would be caused by the destruction of the environment.

Geographic expansion and diversifiability are crucial success factors in evolution on the long term. They make it possible for a replicator or interactor to exist simultaneously in various environments, making it resistant against extinction that would be caused by an environmental catastrophe that would destroy an entire environment or an environmental

⁶ Metal fingerprinting, such as Lead Isotope Analysis, may also promote over-interpretation, as some similarities may be caused by environmental factors and chance resemblance (Degryse 2023).

⁷ Cox, Moore, and Ladle (2016, 106).

⁸ Laihonon, Salo & Vuorisalo (1986, 26).

⁹ Dawkins used the term "replicant" but in this book the terms *interactor* and *replicator* are used based on Hull (1980).

¹⁰ For companies, an analogical reproduction form to sexual reproduction is the founding of joint ventures, and an analogical reproduction form to asexual breeding is the founding of a chain of identical production sites or service points, which may also be franchised.

niche. Environments can be divided to geographical environments and to *niches*, which are specific areas of competition within a geographical environment. Examples of niches include *ecological niches* and *market niches*. Replicators and interactors that occupy a specific niche will primarily compete against other occupants of the same niche. Replicators can exist in several environments only if they make copies of themselves, but some large interactors like corporations, empires and civilizations may exist in many environments due to their geographic expansion or diversification. The most effective way for a replicator to spread to new environments is to diversify into several interactor species and to several larger replicator structures. Because of this diversification, the replicators will increase their chances of spreading to new geographical environments. Corona viruses, for example, have diversified to several animal species, which have spread to all continents and to several ecological niches. Spreading to several environments is important for avoiding extinction. Another example is papilloma viruses, which existed originally only in the ecological niche defined by the *Neanderthal* population (Chen et al. 2017). Therefore, these viruses would have become extinct with the *Neanderthals*, if they had not diversified to the *Homo sapiens* populations.

Modularity and combinability are factors that improve the diversifiability of a replicator. Modularity converts large and monolithic replicators into structured sets of smaller and simpler replicators that can be copied with lower chance of copying errors. In addition, modularity means that if a copying error appears, its effects will be mostly local, not affecting the other modules. Combinability means that modular replicators can diversify into several larger replicator structures. In biology, the importance of modularity and combinability has led to the evolution of genes and sexually breeding species, as sexual breeding maximizes variation within a species, and as variation is an important success factor of all species in evolution. In cultural evolution, it is advantageous for a meme to diversify into several religions, which are then able to spread onto many

continents and on the long run, possibly to several planets. This applies also to loan words, which spread from one language to another, and are then carried by different cultures to several continents of the world. A third example is the names of widely known heroes. *Atlas*, for example, is mentioned as a protagonist in the stories of Homer, Hesiod, Plato, and Diodorus Siculus. Although these stories were relatively different from each other, they all helped the name *Atlas* to survive in cultural evolution.

Attractors are holistic properties of systems, which set-up modalities for the states of the system (Gleick 1987). An example of an attractor is the dynamic balance between a predator population and the population of its prey. Another attractor is the economic balance between supply and demand. Attractors may also be created by stable functional requirements. For example, a cup needs to be able to contain liquid, and it should not emit severely toxic or bad tasting substances to the liquid that is being drunk. These functional requirements induce an attractor, which will have an effect on the long-term evolution of different forms drinking vessels, even if the short-term evolution might favor cow horns instead of cups, and even if some civilization might develop the fashion of using lead vessels. A replicator that matches with an underlying attractor will have a high chance of long-term survival in the evolution, as the attractor is likely to give birth again to the replicator that has temporarily become extinct in evolution.

Chaotic multi-level evolution: Interactors tend to appear at several levels of hierarchy, and this complicates the models that explain and predict evolution. For example, a virus or a meme may be carried by a person who belongs to a family, which belongs to a community, which is part of a civilization. A gene may be carried by an animal, which belongs to a *deme*, which is part of a larger regional population (Wilson 1975). According to Gould's synthesis, the evolutionary success of a replicator depends on its combined effect on the different level interactors that carry it (Gould 1982). The existence of these hierarchal interactor levels makes it difficult to predict evolution, as the natural selection forces may operate towards opposite

directions on different levels: Simultaneous contradictory forces cause systems to behave in a chaotic manner (Gleick 1987). For example, a gene or meme can be beneficial for its carrier person, harmful for the community, beneficial for the civilization, and harmful for the environment. For example, a biological or cultural replicator that causes *greed*, *ambition*, and *megalomania* may become extinct in the long term, if it causes its carrier interactors to make their environment inhabitable. On the short and medium term, however, genes and memes that cause greed, ambition, and megalomania may be more successful than their allele genes and memes. Due to the chaotic nature of multi-level evolution, precise predictions concerning future evolution are impossible. Instead, it is better to perceive and predict evolution by formulating a set of parallel processes that form that pull the system towards certain states, however, in a somewhat chaotic manner (see chapter 1.8 and 1.9).

Recognizability means the ability of an external scholar of evolution to observe replicator and interactor forms, and to perceive events, in which a form changes, becomes extinct, or is born. Without recognizable *forms*, the changes of replicators and interactors cannot be observed and measured. This would mean that the longevity, fecundity, and fidelity of the replicator could not be measured.

Predictions and explanations

The purpose of a good scientific model is to explain the past and to forecast future. Below are the central predictions and explanations of the DH theory, which are applicable to all biological, social, and cultural systems. They describe the evolutionary success factors of replicators and interactors, and of systems that are made of replicators and interactors.

1) Evolution favors systems in which replicators use interactors that carry them to new generations and to new geographical areas. This prediction explains why genes, viruses, and animals evolved in the biological evolution.

2) Evolution favors replicators that increase the growth, longevity, and fecundity of the interactors that carry them, or create other benefits for these interactors. The effects on growth, longevity, and fecundity depend on the environment of the interactors, which means that the replicators that have a good or optimal match with the environment are likely to increase their relative frequency. This could explain, for example, why agriculture and herding started to replace the hunter-gatherer lifestyles when the raise of the sea water during the Holocene led to overpopulation and to the need of seeking for those sources of food that were earlier considered insignificant (Binford 1968).

3) Evolution favors systems in which replicators are carried by interactors that form higher-level interactors such as large tribal organization, large and organized communities, kingdoms, and civilizations. This principle explains why *Homo sapiens* replaced the *Neanderthals* in biological evolution.¹¹ In addition, it explains how global commercial brands evolved, and why they have been successful in replacing local goods and services. The production of goods in larger companies will bring advantages of scale, which will make it possible to create even better products and services, which are then able to compete internationally. The best companies and products that survive in this competition become global brands that gradually replace the goods and services provided by local professionals or push them to small, specialized niches.

4) Evolution favors replicators that have a better longevity than their alleles. This explains why written stories and cave paintings tend to survive better in cultural evolution than orally transmitted stories. Yet, oral traditions may also be very long-lived, if two somewhat different versions of the tradition are considered as the same tradition.

5) Evolution favors replicators that have a higher fecundity than their alleles, unless the replicator severely reduces the longevity of its Carrier. This principle explains why some viruses and fashions

¹¹ *Homo sapiens* was better in communication, which made it possible to organize the activities and actions of larger tribes,

and to motivate larger groups of people to work for the same bigger mission and goal (see Harari 2014).

spread rapidly around the world unless they severely reduce the lifetime expectancy of their carrier.

6) Evolution favors simple replicators because they have a higher copying fidelity than the complicated ones. This explains why large and complicated memplexes like languages, methods, theories, stories, and belief systems tend to break into memes like words, heuristics, statements, motifs, and beliefs in the cultural evolution. In addition, it explains why we should not study biological evolution at the level of species, but at the level of genes, and why we should not study cultural evolution only at the level large memplexes such as cultures, languages, stories, and religions. Instead, we should usually focus on smaller memes like words, motifs, and customs as they tend to recombine flexibly into new versions of larger memplexes such as dialects, languages, stories, religions, and cultures.

7) Evolution favors modular replicators that are compatible with larger knowledge structures, so that these flexible and dynamically changing larger structures can then carry them to various geographical and ecological environments. This

principle explains why simple ideas like monotheism have been able to diversify to several monotheist religions, and why these ideas have then spread to all continents. In addition, it explains, how some loan words and loan names have become international, and have spread all over the world even if the social interaction or culture that created them may have disappeared.

8) Evolution favors large replicator structures only if they have a clear and rigid *core* that has a high longevity, and fidelity and a set of peripheral replicators that are capable of altering their form in order for the core to remain viable even in a challenging or changing environment. For example, a scientific paradigm may survive in cultural evolution as long as the core of the paradigm stays intact although the peripheral parts of the paradigm change. Yet, it is a somewhat subjective interpretation to say that the entire paradigm survived if only its core survived.

The evolutionary success factors of replicators are summarized to Table 1, which illustrates how strategic benefits (on the right) are derived from success factors (on the left).

Table 1: Success factors of a replicator in evolution

Success factor	Direct effect	Strategic benefit
Longevity of the replicator	There is enough time to make many copies → Many copies	Short and medium term success in evolution
Fecundity of the replicator	Many copies of the replicator	
Fidelity of the replicator	Many correct, non-mutated copies of the replicator	
Benefit of the replicator to the growth and longevity of interactors (at different levels)	Many copies of the replicator	
Modularity and compatibility of the replicator with other successful replicators	Diversification of the carrier interactors to several environments	Long term avoidance of extinction
Benefit to the fecundity of the interactors		
Compatibility of the replicator with an attractor	Ability to be born without a parent instance	

The success factors integrate the ideas of Buckley (1967), Dawkins (1976), Hull (1980), Miller (1978), Gould (1982), and Nelson and Winter (1982)

whereas the strategic benefit column integrates into the model Cooper's idea of avoiding extinction on the long term (Cooper 1984). As can be seen from

this table, the DH theory focuses mostly at replicators and considers the interactors only to some lesser extent. Therefore, the DH theory is not comparable to the social Darwinist theories of the early 20th century, which suggested that powerful civilizations and “races” are likely to replace their less fit competitors. Neither does the DH theory perceive cultural evolution as a linear process, which would lead to the continuous improvement of cultures and societies in the way that was suggested by Lewis Henry Morgan during the late 19th century. This is partly caused by the chaotic, multi-level selection processes that have been described above. The following chapters will clarify this message.

1.3 Different kinds of cultural replicators and their transformations

The previous chapter explained how humans, cultures, and civilizations emerged, and what the big principles of all evolution are, in general. The purpose of this chapter is to present those principles of the DH theory, which can be used for explaining and predicting the evolutionary success of different kinds of cultural replicators. According to the DH theory, cultural evolution is a process in which social interactors like organizations, communities, and civilizations invent, recombine, and utilize *cultural replicators*; and copy them from generation to generation, and from one geographical region to other regions. Cultural replicators can appear at different sizes and formats, which are described below.

Cultural replicator is a general concept that covers *memes*, *memeplexes*, and *meme sets*. **Mememes** are relatively small and crystallized cultural replicators, which act as central units of cultural evolution (Dawkins 1971, Malmi 1988, 1992, 2009, 2021). They include shapes, designs, decorations, statements, names, words, signs, symbols, phonemes, rules, norms, values, beliefs, stereotypes, stories, motifs, and easily reproducible digital objects like images and video clips. In social sciences and linguistics, memes are called

discursive elements.¹² In theory, memes could be big and complicated knowledge structures. However, in practice only small and crystallized memes will have a high enough *fidelity* and *combinability* to survive in the cultural evolution without a change or extinction, unless they are stored with modern methods into copies that resist copying errors and unless they are archived into archives that will last for hundreds of years.

Memeplexes: In Wiktionary, a memeplex is defined as a “*set of memes which interact to reinforce each other*”. According to Blackmore (2000), examples of memeplexes include languages, religions, scientific theories, political ideologies, and belief systems. In the DH theory, a memeplex is defined as *a set of memes that have a semantic, logical, functional, contextual, or statistical connection to each other*. The logical connection contains both correct and incorrect logical relations, meaning that also false conclusions may connect memes of the memeplex to each other. Some memeplexes such as concepts, stereotypes, scripts, scenes, and frames, are mental representations, which are studied by cognitive scientists.¹³ Written and spoken memeplexes like songs, poems, proverbs, jokes and folktales are studied by folklorists. Physical memeplexes such as material cultures, archaeological industries, and landscapes are studied by archaeologists. Performative memeplexes like rituals are studied by anthropologists. An example of a memeplex that combines mental, written, spoken, and performed memes is *masculinity*: People have mental representations and stereotypes of masculinity, they reflect masculinity in their spoken and written discourses, and they may also perform masculinity (Butler 1990).

Meme sets are sets of memes that do not actively interact with each other, or the interaction exists but it is ignored. In this definition, interaction could mean that the memes are parts of each other, or are so closely connected to each other that they interact. For example, the forenames that are used in some specific culture or region form an *ethnic name set* as

¹² Habermas (1984), Laclau & Mouffe (1985), and Fairclough (1993, 38).

¹³ E.g. Whitney (2001).

the forenames do not interact with each other or the interaction can be considered so small that it can be ignored. Other examples include the *list of gods* that are worshipped in some polytheist culture, and the *list of national holidays* in some modern culture. If a meme set is perceived to have a clear structure, then it is better studied as a memplex than as a meme set.

Meme–memplex dualism: Memes can often be studied as memplexes, and memplexes as memes. For example, a book that is distributed as a PDF file is a meme, but it can also be studied as a memplex that contains lower level memes such as sections, chapters, paragraphs, sentences, phrases, and words. Words can be easily considered as memes, but in addition, they can be studied as memplexes that consist of a stem and affixes. Even the stem of a word can be perceived as a memplex, which consists of phonemes or letters that are presented in the correct order. A simple artefact such as a dagger can be studied as a meme, but it can also be perceived as a memplex that consists of parts such as “blade”, “handle”, “pommel”, “inscriptions”, and “decorations”. A simple story of a dozen words can be considered a meme, but it can be also analyzed as a memplex that has a protagonist, a place (setting), and some act or event. When memes are studied as memplexes, it becomes more evident that memplexes exchange and share memes with each other. This is called *intertextuality* in the field in the study of literature and cultures, but the concept can be used in archaeology and folkloristics too.

Fuzzy memplexes are memplexes, to which memes belong at varying degrees (see Zadeh 1965). They include those cultures, languages, discourses and concepts, which appear as collections of memes that belong to the memplex at varying degrees so that some memes belong almost fully and others hardly at all.¹⁴ The fuzziness of the fuzzy memplexes is partly caused by the unclear definition of these memplexes, and partly because of their subjectivity: They are usually perceived

based on subjective observation and pattern recognition.

Cultures: Although some early archaeologists considered cultures as interactors, in the DH theory they are considered as large memplexes that contain material, mental, performative, and etched replicators. Cultures tend to be fuzzy memplexes, into which the memes of the culture belong to at varying degrees. For example, *reindeer stew* and *pizza* both belong to the Finnish food culture of the 21st century, but one could say that *reindeer stew* belongs to the Finnish food culture at a stronger degree as it was adopted into the Finnish food culture longer time ago than *pizza*. In some cases, the groups of people who carried a specific culture can be almost equated with the culture. For example, the Lapita culture could be almost perceived as an interactor that extended from New Guinea to Polynesia (Renfrew & Bahn 2012, p. 464). Even in these cases, however, it is better to consider the people who carry a specific culture as an *ethnic group*, instead of considering the people and the culture as the same.

Core and parts: Memplexes such as concepts, discourses, languages, and cultures tend to consist of a *core*, which is surrounded by *connected parts* and *peripheral parts*. The core, connected parts, and peripheral parts can all be memes or memplexes. The connected parts have a direct logical or structural connection to the core whereas the peripheral parts have only a statistical connection to the core or an indirect logical or structural connection. Languages, for example, can be studied as memplexes in which the core consists of their authentic lexicon and their characteristic grammatical, morphological, and phonetical features. The connected part of a language could be defined to contain those loan words that have been loaned so long time ago that they are “almost authentic” parts of the language. The peripheral parts of languages can be defined (for example) as those regions and ethnic groups, in which the speaking of this language is more common than in

¹⁴ Natural emergence is the opposite of artificial creation. Artificially created cultures, languages, and discourses may have clear boundaries, as they are defined that way. Naturally

emerged “use based” cultures, languages, and discourses exist only as observations, based on the pattern recognition capacity of the observer.

many other regions and ethnic groups, or as those authors who have written books in this language.

Material cultures consist of a core, connected parts, and peripheral parts. The core consists of an artefact or an archaeological package that characterizes the culture (e.g. a bell-formed beaker of the Bell Beaker Culture). The connected parts are those replicators that tend to appear with the core (e.g. the methods for producing bronze objects and alcoholic beverages). The more peripheral parts of a culture may include those genetic replicators and ecofacts that have a statistical connection to the culture without being classified into the core or to the connected part of the studied culture.

The core memes of a replicator may be identified by evaluating, which memes are semantically, logically, and functionally most essential to the studied memplex. Another method for identifying the core memes is to draw the memplex into a memetic diagram in which the connections of the memes of the memplex are illustrated with lines in such a fashion that strong connections are illustrated with thicker lines. These illustrations may help in the identification of the core memes that have a very high amount of connections to each other and some connections to the surrounding connected memes. This method of identifying the core can be automated with the tools of network analysis, if there is a clear method for measuring the frequencies and strengths of the connections between connected memes.

The core memes of a memplex belong to the memplex fully (with the strength of 1) whereas the connected memes have a weaker membership in the memplex, and the peripheral memes have the weakest connection (which is still stronger than 0). The connected and peripheral parts make memplexes flexible. This permits them to *change* and *not change* at the same time. This occurs when the core remains the same whereas the connected parts face minor changes, and the peripheral parts face major changes. As the peripheral parts of the memplex belong to the memplex only weakly, even their major changes do not cause a significant

change to the holistic essence of the memplex. Connected and peripheral memes help the core of the replicator survive in cultural evolution, as they make the replicator adaptive, while still defending the stability of the core memes. An example of this phenomenon is the way in which ad-hoc arguments are used to defend the theoretical core of a paradigm.¹⁵ The question of memplexes that simultaneously change and maintain their essence has a long history in philosophy. It was first postulated by Heraclitus (5th century BCE) who pondered whether it is *possible to step into the same stream twice*.

Artificially formed cultural replicators are defined by scholars. They are theoretical models of the real cultural replicators that are carried by interactors such as persons, families, communities, and civilizations. Artificially formed cultural replicators are usually simplifications, in which the peripheral parts and corner cases are ignored. In phonetics, for example, only a reduced subset of all sounds, which human and animal speakers may produce, are classified as phonemes. In linguistics, the definition of a language is constructed (partly) on its lexicon, in which loaned words, utterances, and misunderstood, mis-spelled, and mis-understood variants of words are ignored, as are those anthroponyms and place names that do not seem to have a meaning in the lexicon of the language. In folkloristics, a story can be reduced to its motifs, which are defined and classified by scholars. This means that some relatively significant parts of the story, such as the gestures and tones of the storyteller, are ignored. In archaeology, a material culture of a specific region can be artificially defined to include only those artefacts that seem to have been produced in that specific region, which would exclude those items that seem to have been imported from other regions.

Ontological formats are the alternative ways, in which cultural replicators can appear. According to the DH theory, these formats are the mental, performative, etched, material, and taxonomized format (Malmi 2009).

¹⁵ See Kuhn 1971 and Lakatos 1978.

1. *Mental* cultural replicators are studied by cognitive scientists. They are the images, patterns, concepts, words, scenes, scripts and frames, which intelligent animals store into their neural networks when they observe and memorize the phenomena of the world (see Von Eckardt 1993).
2. *Performative* cultural replicators are studied by anthropologists. They are rituals or scripts that represent memes and discourses in the form of action. For example, when a boy participates to an initiation rite that converts him to a man, he participates to the performative representation of masculinity (see Butler 1990).
3. *Etched* cultural replicators are replicators that have been attached to a material media by different methods, such as drawing, inscribing, engraving, tattooing, burning, or writing.¹⁶ Etched replicators can contain *codified* replicators such as symbols, signs, or texts.
4. *Material* cultural replicators are studied by archaeologists. They include *artefacts*, *constructions*, *ecofacts*, and *landscapes* (SAA 2022). Ecofacts are culturally determined biological replicators, such as the genes and species of domesticated animals and cultivated plants. The replication of a material cultural replicator may occur intentionally or unintentionally. An example of intentional replication is the process, during which someone first creates a mental representation of an artefact or construction, and then *manifests* it into material form, and then someone else tries to make a copy of that artefact or construction (Malmi 2009). An example of unintentional replication is the replication of an overgrazed landscape from one region to another, or the spreading of harmful ecofacts such as pests and parasites to new regions. Material replicators such as artefacts and constructions can act as storage media for etched replicators. An ancient sword, for example, may contain an engraving, which tells the name of its maker.
5. *Taxonomized* replicators are attribute-value pairs, traits, classes, forms, types, phenotypes, cultures, or families that have been created by external observers in order to study and analyze the evolution of some replicators of ontological types 1–4 or the evolution of different types of interactors. They can sometimes be biased and without a solid connection to the replicators of type 1–4.¹⁷ Yet, they are necessary, as some replicators appear as phenotypic system level properties of social interactors (e.g. communities, societies, or civilizations). The evolution and diffusion of such replicators would not be possible to measure without first creating taxonomies for them. For example, it would not be possible to study the evolution of the *Despotic Asian states of the Bronze Age* without first defining this concept as a taxonomized replicator. Taxonomized replicators may also be necessary to study the evolution of attractors, which may be induced by replicators. For example, a genetic mutation in an edible plant may induce into a hunter–gatherer community the attractor of a *sedentary agricultural society*, which is a taxonomized replicator and an attractor at the same time.¹⁸

Features are taxonomized replicators that measure the characteristics of mental, performed, etched, or material replicators. Each feature is an *attribute–value* pair, in which the attributes (or attribute dimensions) are measured with classes, which are based on a binary, nominal, ordinal, or interval scale. The advantage of this definition is that it is possible to measure the amount of those replicators that have this feature, compared to the amount of allele replicators that have some alternatives feature of the same attribute dimension (see 1.2). In folkloristics, features are called *traits* or *motifs*.¹⁹ In the context of archaeology, the concept of a *Feature* needs to be capitalized. This is because in archaeological texts the word *feature* has a different meaning: It means a non-portable archaeological finding that indicates human activity.

¹⁶ The idea of etched replicators connects to the idea of “external symbolic storage” presented by Donald (1993). The method of *burning* has been used to etch replicators to CD discs, for example.

¹⁷ Examples of this bias may appear in archaeology (see Renfrew & Bahn 2012, 464), in anthropology and folkloristics

(e.g. “the folk character of the German people”), and in cultural studies (e.g. “the Finnish food culture”).

¹⁸ The systemic and morfogenetic change that appeared in the food production in Mesoamerica 8000 – 2000 BCE has been studied by Kent Flannery 1966 – 1980 (see Renfrew & Bahn 2012, 480).

¹⁹ Thompson, S. (1977, 415).

Forms are defined by the set of Features that a replicator must have in order to carry that form. Forms may be based on a large set of Features that are each based on a different attribute that can be measured with several alternative classes. Due to this, the possible amount of alternative forms may be so big that it is no longer possible to list all alternative forms or to measure their frequencies among the observed cultural replicators.

Types are relatively context sensitive taxonomized replicators whose definition depends on the traditions of the field of science that studies them.

Replicator families are taxonomized replicators that have been formed based on the analysis of the forms and meanings of cultural replicators. Replicator families are used especially in linguistics and folkloristics. In the study of genetic replicators, each haplogroups represent a replicator family. Families can be grouped together to form “larger families” that are called genealogical or taxonomical trees. Although the replicator families are artificially created taxonomized replicators, they may remain fuzzy so that it remains unclear what replicators belong to the family. This fuzziness resembles the fuzziness of the concept *species* in biology.

Discourses are commonly defined either as *communicative activity*²⁰ or as a *unit of connected speech or writing that is longer than a sentence and that has a coherent meaning and a clear purpose*.²¹ The concept of a discourse was first introduced by Foucault (1970). In traditional discourse analysis, emphasis was mostly on those discourses that appear in the form of text or speech (e.g. Kittredge & Lehrberger 1982). Later on, the concept of a discourse was defined more widely as a *particular way of talking about and understanding the world or an aspect of the world* (Phillips & Jorgensen 2004, 1). Scholars of discourse analysis such as Foucault, Habermas, Laclau, Mouffe, and Butler have used the concept of a *discursive element* for referring to the parts or components that together make a discourse. The relation between a discourse and a discursive element is logically the same as the

relation between a memeplex and a meme. The earliest scholars of discourse analysis perceived discursive elements as words, phrases, sentences, and paragraphs of spoken or written text. Later on, also mental representations were considered as discursive elements (Phillips & Jorgensen 2004, 1). Finally, Butler extended the concept of a discursive element to cover performances and material representations that support a discourse.

Discourses tend to be fuzzy memeplexes, as it is somewhat unclear what discursive elements belong to the core of the discourse and what elements have only a weaker connection to the core. For example, it might be easy to define the core discursive elements of the “neoliberal policy discourse”, but the listing of all relevant connected elements might be more difficult.

Transformation and renewal processes

Conversion is a process, in which intelligent interactors convert cultural replicators from one ontological format to another. A sentence, for example, be converted from spoken format to written format (etched format), and a written sentence can be converted into a mental representation once it is read. A replicator that exists in the mental format in the mind of a person can be converted to performative format (action), to etched format (drawing), or to material format (an artefact).²²

Mutations are changes that occur to the form or meaning of a replicator when it is copied from one person to another and when it is converted from one ontological format to another. Even simple memes tend to face some minor mutations when being communicated to other persons. This creates new *variants* of the original memes. When large memeplexes are communicated from one human interactor to another, and when they are interpreted and paraphrased by the interactor that received them, these memeplexes may face so many

²⁰ Literarydevices.com 2022-04-04, “Discourse”

²¹ StudySmarter 2022-04-04, “Discourse”.

²² In archaeological theory, the importance of conversions has been mentioned, for example, by Renfrew & Bahn (2012, 382).

mutations that the new memplex is no longer just a variant, but actually a new *version* of the memplex.

Renewal is a process in which a replicator maintains its structure and form despite longer communication chains and despite conversions. On the cognitive level, the renewal of a replicator is a process, which makes mental representations somewhat rigid, once they have taken their form. A scientist, for example, may have his favorite theory or hypothesis that steers not only his thinking, but also the way in which he observes the world, collects and filters information, and fits the information to the theory or hypothesis. Because of this process, the theory or hypothesis may not be rejected despite notable amounts of contradictory evidence. On a socio-cognitive level, renewal appears when communicators observe many instances of the same replicator, and are able to distinguish between correct versions and mutated versions. Therefore, the communities of communicators are able to maintain the correct forms of the replicators that they carry. In folkloristics, this is called the law of self-correction.²³ In linguistics, this principle is used for explaining why phonemes may remain similar for centuries within one language. Traces of this same idea are found within the usage-based approach to linguistics, which assumes that languages renew themselves via the constant usage of words and expressions. The process of renewal permits gradual shift in the forms and meanings of replicators, while acting as a control mechanism against sudden major changes. In sociology, renewal means the process, in which the distribution of power in a society defines its dominant ideologies, discourses, and discursive elements, and in which these cultural replicators then support and renew the power structures of the society, making the society resistant to changes.²⁴ This resistance to change tends to appear also in the tendency of social, political, and cultural systems to sanction dissident ideologies, discourses, and discursive elements.

Intertextuality is generally defined as the *interrelationship between texts*²⁵ or as the way in

which two or more texts connect to each other or shape the meaning of other texts. Intertextuality may be intentional, so that the author of a text connects elements from other texts to his or her own text. In addition, it may be unintentional, so that it is the audience, which fabricates the connections. In the DH theory, intertextuality is defined as *the way in which memplexes share memes with other memplexes or connect their memes to other memplexes*. This definition does not require that the shared and connected elements would be textual. For example, an archaeological industry that appears at a specific region or culture, can share artefact styles and **Features** with other regions and cultures. A symbol system such as the Indus Script can share symbols with other scripts, for example, with the Manding Script. Religions can share beliefs with other religions. Stories can share motifs with other stories. Historical documents can be considered as memplexes, which contain persons, places and events (memes) that are referred to in other documents as well.

Metamemes are memes that govern the way in which people select, memorize, apply, transform, communicate, and document other memes (Malmi 1992). They can be, for example, epistemological principles that people use for deciding what statements and beliefs are true. In addition, they can be moral principles from which people can derive norms and rules. Yet, they can also be processes, scripts and other discourses, which specify, how new knowledge should be searched for, validated, replicated, and documented. Metamemes can also be long-term goals and strategies from which shorter-term objectives and plans are derived.

Metamemes can appear as interconnected memes that form larger memplexes that appear in the form of *ideologies* such as nationalism, imperialism and colonialism and which have notable power in shaping the societies and the way in which people interpret the world. Once an ideology or a religion has reached an official status within a social interactor, it may become a rigid structure, which controls the development of all other memplexes

²³ Anderson (1923), referenced by Bronner (2007, 168).

²⁴ E.g. Althusser (1970), Gramsci (1971), Habermas (1984).

²⁵ Definition of "Intertextuality" by [Dictionary.com](http://www.dictionary.com)

and memes in the society. *Cognitive gadgets*, such as imitation, mind reading, and language, are a subcategory of metamemes. According to Heyes (2018), cognitive gadgets have played an important role in cultural evolution by speeded up learning, social interaction, and cultural evolution. According to him, the usage of cognitive gadgets made *Homo sapiens* a special and highly competitive species. Cognitive gadgets are studied within the field of cultural evolutionary psychology. *Dichotomies*, which govern the way of thinking and acting of people in several sectors of the society, are another subcategory of metamemes.²⁶

Metamemes can have an important effect on the renewal of other memes and discourses. Conservative metamemes promote the conservation of replicators. According to them, norms, rules, laws, customs, role expectations, social hierarchies, names, ideologies, religions, language, and traditions should not be changed. The core memes of conservatism are the following: 1) *our current society is relatively good*, 2) *because it has been constructed by our hard working, intelligent ancestors*, 3) *and therefore we should not change our society too much*, 4) *we should not let our valuable culture be replaced by a foreign culture*. From the point of view of the study of cultures, the positive part of conservatism is its ability to transfer memes such as words and names unchanged throughout millennia. The negative part is that conservatism makes societies uninterested of the search, application and loaning of innovations that would be beneficial for the society, civilization, or culture. This will reduce the longevity of overly conservative cultures, civilizations, and societies, especially during times of rapid environmental and technological changes, which change the economic attractors and modalities of societies.

Progressive metamemes and ideologies promote the change of traditional memes, discourses, cultures, and languages. Their benefit is that they may help in the effective replacement of old beliefs, theories,

and technologies with ones that are more competitive. Their risk is that they are used to change the society and culture, but after the change, they convert to a conservative ideology that wishes to defend the new status quo. Such ideologies may be called pseudo-progressive. An example of a pseudo-progressive ideology is *forced modernization*, which means the replacement of traditional cultural replicators of one culture with something that the conqueror or colonialist considers modern. From the point of view of the study of cultural evolution, progressive and pseudo-progressive ideologies are interesting, as they can rapidly force the extinction of some memes that are considered old-fashioned, or politically or religiously incorrect.

Natural selection favors those metamemes that induce fast learning and the effective accumulation and recombination of knowledge. In addition, it favors those interactors that carry the most beneficial metamemes.²⁷ Examples of beneficial metamemes of modern societies include literacy, scientific method, specialized knowledge maintenance roles (e.g. librarians), professions that accumulate knowledge within their own field, and institutions and tools like libraries and databases. In prehistoric societies, beneficial metamemes included the *appreciation of knowledge*, and the specialized knowledge maintainer roles such as *priests, sages, skalds, epic poets*, and professionals of various professions such as *fishers, hunters, farmers, blacksmiths, and traders*. In addition, ancient metamemes included systems that promoted the inheritance of knowledge from a master to apprentices, and from a parent to child.

1.4 Concepts, labels and meanings

Concepts and labels are important for understanding how mental, performed, etched, and material replicators receive their meaning, and how they are interpreted and communicated by humans and by

²⁶ Dichotomies and other social structures, see Lévi-Strauss (1949) “Les Structures élémentaires de la parenté” and Glassie (1976) “Folk Housing in Middle Virginia”; referenced by Renfrew & Bahn (2012, 485).

²⁷ Malmi 1992; Lenski (2005).

other intelligent thinkers such as dolphins and AI algorithms. According to a dictionary definition, concepts are abstract or generic ideas that are generalized from particular instances.²⁸ The basic steps of concept formation are observation, generalization, differentiation, and abstraction.²⁹ Concepts are conceived in the mind.³⁰ According to cognitive science, animals like dolphins, pigeons, and honeybees can create primitive, stereotypic concepts, based on their observations and generalizations, without using words for these concepts.³¹ If we extend the definition of a *mind*, we

may say that algorithms and artificial neural networks create concepts in their minds. According to the DH theory, *Concepts* are memeplexes that contain a generalized *stereo-concept* as their core, and *labels* and *definitions* as their optional connected parts. Labels are words, symbols, and signs that refer to the stereo-concept. The intertextual connections of concepts to other concepts via *labels* and definitions form the peripheral part of each concept. Figure 1 below illustrates the structure of concepts and the emergence of their meaning.

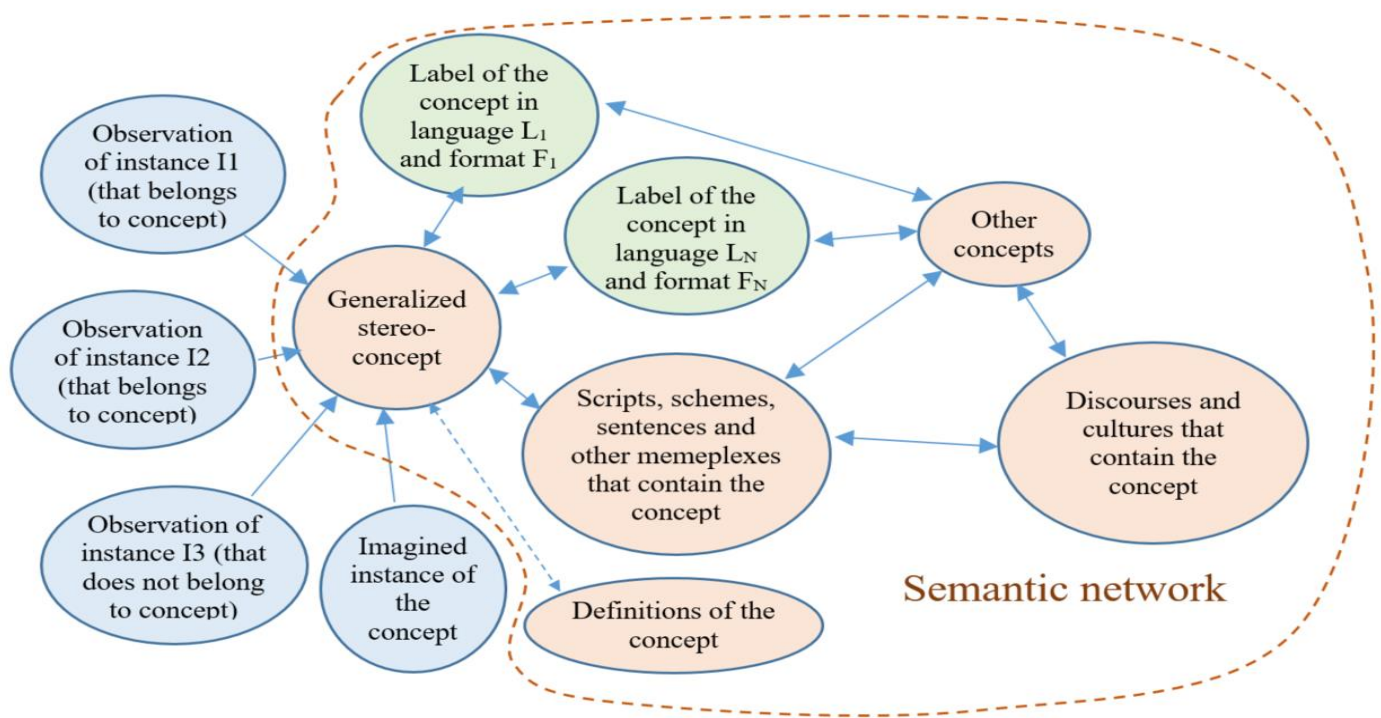


Figure 1: Structure of concepts and the emergence of meanings

Blue circles produce input for concept formation, red circles carry a meaning, and green circles are mere pointers to meanings that exist in the minds of intelligent interactors. As the meanings of concepts are *usage-based*,³² the role of formal definitions in the learning of concepts is somewhat insignificant, especially in the context of simple concepts and the language that is spoken by children. This model

matches the models of cognitive archaeology, according to which the meanings of *symbols* emerge from their connection to other symbols (see Renfrew & Bahn 2012, 389).

The first step in the evolution of concepts and labels is concept formation within the mind of one single human, animal, or algorithm. This process is based on observations and generalizations; it will lead to

²⁸ Merriam-Webster 2022-04-08, "Concept".

²⁹ Hunt (1962), Gennari, Langley & Fisher (1989), MacLellan et al. (2016), Kemple (2019).

³⁰ Merriam-Webster 2022-04-08, "Concept".

³¹ Dolphins invent their own names (Janik et al 2006), pigeons can learn the concept of a "tree" (Nikolaus et al. 1999), and even honey bees can learn concepts (Gould 2004, 374).

³² See usage-based linguistics (p. 54).

the creation of a generalized stereo-concept. Intelligent animals and algorithms are capable of concept formation. Algorithms can create concepts after having been shown a sufficient amount of instances of different objects.³³ For example, the algorithm can form the concept of a *giraffe* after having seen a sufficient amount of images of giraffes and other mammals. In addition, artificial neural networks can develop concepts like “a cucumber” and “a pineapple” based on observations.³⁴ Mental labels are mental symbols that are condensed versions of the stereotype that refers to the concept. They are analogical to the thumbnail images that Microsoft Windows shows when listing images: They capture the essence of the image in a very condensed form, making it possible to process images even without file names (which are written labels that refer to the images). According to the DH theory, it is possible for humans and intelligent animals to think without a language by using mental labels.

Meanings, which are more abstract than the mere sensory image of an object, can evolve without definitions. They are generated by the scripts and schemes, in which the concept participates. For example, if young lions observe how gazelles are frequently captured and eaten (which is a script), then the meaning of a gazelle connects to the concept of *food* in the minds of these lions. If the visual image of a stone axe connects to the script of cutting a tree and making a canoe, then the meaning of a stone axe will include *tool for cutting trees and making canoes*.³⁵ This means that the function of a meme within a script, scene, or frame is an important part of its meaning. As the evolution of concepts, labels, and meanings is possible without the existence of a (shared) language, it is possible that intelligent thinkers have existed before the evolution of spoken languages. This means that

cultures may have existed before the invention of language in the form of *material culture* (e.g. tools and clothes) and in the form of related *mental replicators* that may already be socially somewhat standardized.³⁶ The final steps in the evolution of concepts and labels are the invention of language, which gives a socially standardized meaning to the spoken and acted mental replicators, and the invention of etched representations such as drawn symbols and written words.³⁷

1.5 Migration, diffusion, and Least Cost Analysis (LCA)

Migration is a process, in which an interactor moves or extends to a new geographical area, carrying along its replicators, which may move along as mental representations, etched replicators, artefacts, or ecofacts. In archaeology, the migration of replicators to new geographic regions is called *diffusion*; the migration of people is sometimes called *demic diffusion* (Cavalli-Sforza 1995). Migration may appear as voyages from starting point to the destination without intermediate points along the route. An example of such migration was the settlement of Madagascar by Austronesian migrants who sailed (relatively) directly from Indonesia to Madagascar. Migration, however, often happens as gradual movement of an interactor or a replicator from the starting point towards a distant region over centuries. An example of this is the migration of agriculture and the Anatolian farmers towards the British Isles along the Mediterranean, and along the coast of the Atlantic Ocean during the time span of several thousand years (Sánchez-Quinto 2019). According to Anthony, (1990, 903), long-distance migrations usually begin with the activities of merchants, trappers, mercenaries, crafts specialists, or other information-relaying scouting groups.³⁸ An

³³ See Godin & Missaoui (1994).

³⁴ See Schmidhuber (2014).

³⁵ According to archaeological theory, such meanings can be shared by communities (Renfrew & Bahn (2012, 382).

³⁶ For example, the ideas about how to manufacture and use tools and clothes may be socially standardized, leading to

standardized products that do not deviate from the other tools and clothes of the same population (see Isaac 1989).

³⁷ In some rare cases, linguistic labels have been stored on Material format such as the *quipu* of the Incas.

³⁸ This idea originates from Ernst Ravenstein, who analyzed migration at the end of the 19th century (McSparron 2023). The idea of short consecutive migrations was called “leapfrogging” by (Speare 1971 and Ostergren 1979).

example of such migration is the process, during which a trader moves along a trading route, then teaches the route to his son who then moves to an even more distant location along the trading route.³⁹

In common language, the concept of a *migrant* refers usually to a person who moves to a new geographical region. In the DH theory, it can also refer to a culture, memplex, ecofact, landscape or other replicator that migrates to a new region. The migration of a person from one region to another may take only a few years and always less than the lifetime of the person. However, the migration of a culture, people, ecofact, or a memplex to a distant region may take several centuries (e.g. the migration of agriculture from Anatolia to the British Isles). The migration of replicators may sometimes appear via a network of interactors, without the actual migration of interactors. In modern archaeology, this is called *trans-cultural diffusion* (Cavalli-Sforza 1995). Artefacts, for example, can migrate thousands of kilometers along trade routes without any human trader traveling more than just some hundreds of kilometers.⁴⁰ Another example of the migration of replicators without the migration of interactors is the genetic effect of long distance traders, adventurers and raiders who carried genes to distant regions (producing offspring) without migrating themselves on a more permanent basis. In such a case, replicators (genes) migrated without the migration of people.

The motives for migration can be classified to *push* or *pull* (Lee 1966), but it is possible to identify also *opportunistic* and *coercive* motives. The push motives appear when the starting point of migration is suffering from war, draught, famine, overpopulation, or political disturbances. Pull motives appear when the destination is considered a very pleasant environment that will offer opportunities for peaceful and prosperous life. Some of the pull motives may be based on naïve optimism or on fraudulent promotion (e.g. migration to “Greenland”). Opportunistic motives appear when

someone originally planned to travel only on a temporary basis, but then decided to stay or had to stay on the planned destination or at some point along the route. Coercive migration means the forced migration of people away from their starting point, possibly due to exile or slavery, or due to the abduction of spouses. In the case of trans-cultural diffusion, *trade* is an important motive that moves artefacts and knowledge from region to region. Other motives include *expeditions*, *venture-someness*, and *tourism*, which are partly motivated by the wish to gain social status and partly by the wish to obtain valuable information about geographic routes and destinations. In addition, migration and travel can also be a *lifestyle*, especially for young adults (Smith 1979), or a method towards *alliances via exogamy and fostering* (Kristiansen 2023, 239). The cognitive motivators for long-distance travel have been analyzed in more detail in chapter 1.8.

According to the German-English geographer Ernst Ravenstein, all migration tends to induce counter-currents which utilize the same migration route but towards the opposite direction (McSparron 2023).⁴¹ According to Burmeister (2000), the best models of prehistoric migrations make use of social sciences, geography, and archaeology. An example of such a cross-scientific model is Anthony (1990, 900), which is shown Figure 2 (p. 26). The accumulation of information is a gradual process, and therefore, *streams* of migration are likelier than sudden *waves* of migration. Waves of migration may occur when there is a strong push factor and already sufficient information of the destination or when the migrating group is militarily superior in comparison to the populations along the route and within the destination. Another process that may induce a bigger wave of migration is the way in which the primary migrants shape the nature so that it becomes more suitable for a secondary wave of immigrants of the same culture. For example, the first pioneers of a herding culture may cut the trees of a

³⁹ Short consecutive migrations were called *leapfrogging* by Speare 1971 and Ostergren 1979 (Anthony 1990, 903).

⁴⁰ Yet, according to Anthony (1990, 4), many instances of assumed “trading” can actually be explained by return-migrants carrying foreign goods back to their homeland.

⁴¹ Ernst Ravenstein 1880’s; referenced by McSparron 2023.

geographical destination, converting it to pasture, and this may become a pull-factor for a second wave of migrants from the herding culture (Kristiansen 2023, 238).

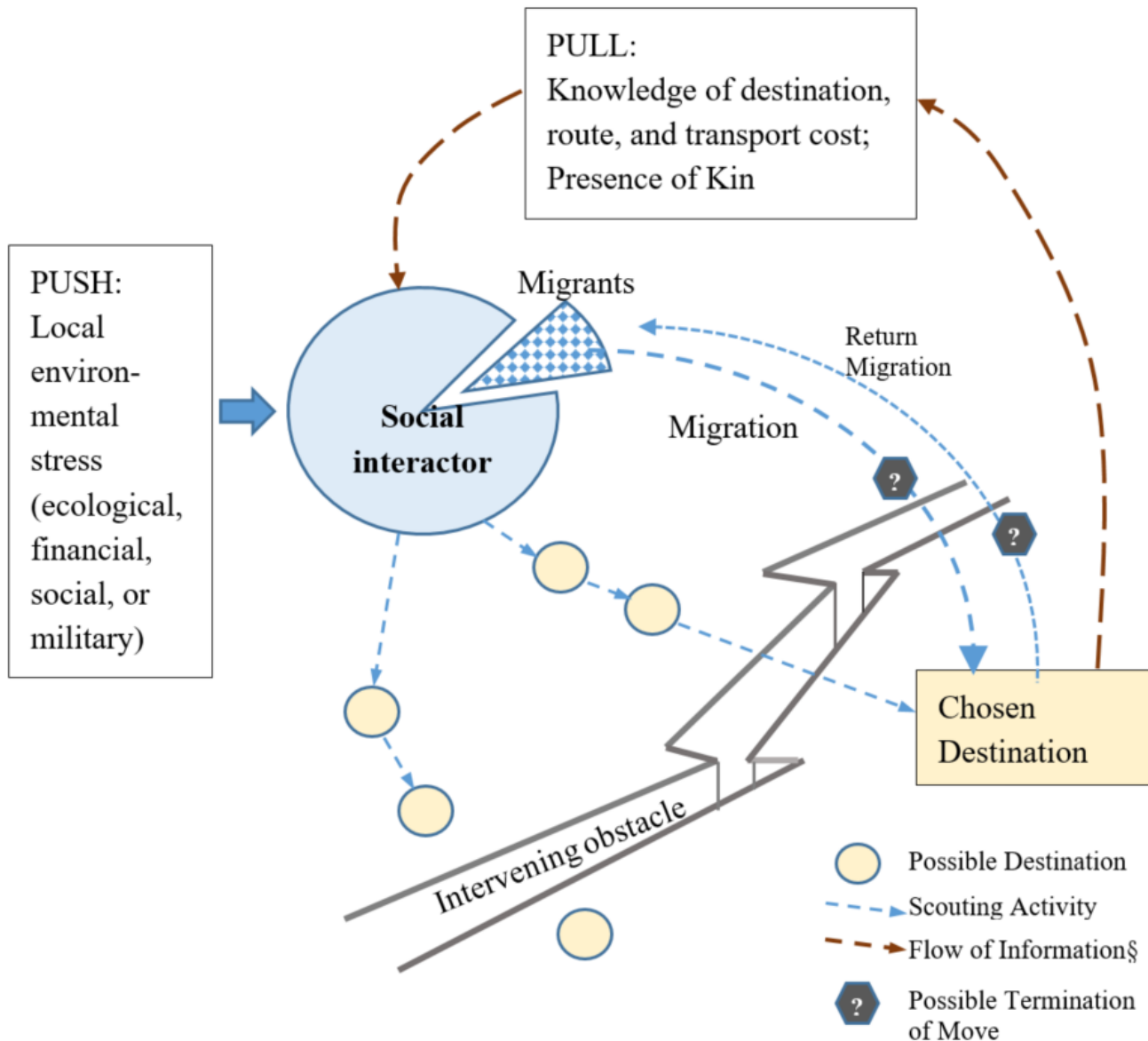


Figure 2: Migration as a processual system (Anthony 1990)

Colonialization is a special case of migration. It differs from migration in magnitude and distance. Colonialization means the movement of a larger group of people to a relatively distant location. During colonialization, large parts of the culture of the parent interactor are usually copied to the culture of the colony. However, if the colonized area was already populated by natives before colonialization, the culture of the colony will emerge as a mixture of

the memes, memeplexes, discourses, and languages of the colonial and native cultures. The composition of this mixture will depend on the quantity and social status of the colonialists. Quantity of the migrants (or colonialists) can be measured in absolute terms, as is done in the Group Agency theory, which divides agency to low (families only), medium (a small migrant ship), high (a large migrant ship), or very high (an entire fleet of

migrant ships).⁴² However, it can also be measured in relative terms, comparing the size of the migrant population to the size of the native population of the destination (e.g. McLaughlin 2023). The social status of the immigrants, when they start to mix with the locals, will depend on the amount of useful new skills, technologies, and knowledge structures that they can apply for the good of the native population. The higher the status the colonialists have, the more effect they are likely to have to the emerging new culture.

Professions consist of professional skills, which are cultural replicators, and of the professionals that carry these discourses and memes. Professions may contain also roles that are dedicated for the replication, preservation, and improvement of knowledge (e.g. master, apprentice, and novice). Professionals may sometimes act as effective “memetic fertilizers” which carry highly beneficial discourses, memes and related vocabularies from one society or region to another. The migration of professionals, across the borders of societies and cultures, has always been better tolerated than other forms of migration. In addition, professions tend to develop their own metamemes, which protect professional knowledge against unnecessary mutations, and which promote the learning of new methods.

Diffusionism and Chance Resemblance: During the history of archaeology, the appearance of two similar replicators in the same form at two relatively distant regions has been perceived as strong indication of migrations. This chain of reasoning is called diffusionism. It has been applied relatively successfully to the diffusion of innovations such as agriculture from the Fertile Crescent towards Western Europe, and to the diffusion of the bell-style beakers from southern Iberia to the entire Western and Central Europe. One criticism against diffusionism is the argument of chance resemblance. Some archaeologists and linguists use the terms *chance resemblance* or *chance similarity* for describing similarities that have occurred randomly. In the DH theory, chance resemblance is

defined as the *parallel and independent appearance of the same replicator in two regions*. Another criticism against diffusionism is systems thinking, according to which environmental factors and cybernetic processes can cause very similar sociocultural results without any diffusion of innovations. According to the DH theory, chance resemblance can be caused by attractors, which pull replicators towards some ideal or superiorly practical forms. Although this is chance resemblance, the probability of such similarity may be very big. For example, it is likely that most cultures will develop drinking vessels that can stand on a flat surface without a support. Therefore, it is likely that cow horns will usually be replaced in the evolution of drinking vessels by cups and classes that have a flat bottom.

The probability of chance resemblance reduces when the replicators are complicated enough. Examples of complex replicators include haplogroups, coins, long names, languages, and ethnic sets (see p. 61). If a complex replicator is discovered in two highly similar variants at distant regions, cultural contact between these two regions is a likelier explanation than the emergence of such complexity at two regions independently in parallel.

Least Cost Analysis as a method for deducing a migration path

According to the DH theory, it is possible to calculate the likely migration path of replicator R with Least Cost Analysis (LCA). The prerequisites for this analysis are the following:

1. *R appears as variants R1 and R2 in locations L1 and L2.*
2. *The variants R1 and R2 are complex enough and similar enough.*

The principle of LCA is to connect two geographical locations by the route that minimizes travel costs, which are measured by travel days taking into account also the risks and financial costs of the travel. LCA is based either on a pre-calculated *travel cost network* or on a pre-calculated cost

⁴² Murphy & McSparron (2019)

surface matrix.⁴³ In the study of cultural evolution, the travel cost network is the better approach: It can recognize rivers as potential barriers for travel unless the migrants have vessels. In addition, the travel cost network takes into account the different travel times for moving upstream versus downstream. The travel cost network consists of a map that shows a set of points of interest (POI). The POI's can be settlements, oases, crossings of narrow straits, locations where two rivers meet, locations where a boat needs to be pulled across dry land, or crucial turning points along a sea route. The POI's are connected to their neighboring POI's by a network of paths and waterways that each has a likely travel duration and potentially information about costs and risks. A good example of a travel cost network is the Stanford Geospatial Network Model of the Roman World (ORBIS).

Once the travel cost network for the studied period has been created, it is possible to use an LCA algorithm for the identification of the shortest or otherwise least costly migration path of a replicator between two POI's. If the target is to calculate or estimate the migration path of a replicator from an identified earlier location to an identified later location, the migration path is the path along the travel cost network, which minimizes travel time, taking into account the travel costs and travel risks. This method can be used, for example, to calculate the migration of a language group from its known *urheimat* to its later locations, or for the calculation of a haplogroup from its known origin to its later location.

Geographical concepts

The following labels are used in chapter 04 and 5 of this book to refer to geographical regions in some specific and somewhat non-conventional manner:

North Sea (region) refers to the islands of the North Sea and to the Atlantic façade from the Basque country until Norway.

British Isles refers to Britain, Orkney Islands, Outer Hebrides, Ireland, and several other islands of this western archipelago. Although the “Western Archipelago” as a geographical concept would probably be preferred by the Irish, it is not specific enough, as there are many different western archipelagos in the world and in addition, the concept of *west* depends on one's own geographic location.

Corded Ware Europe is used in chapter 5 to refer to the Nordic countries, Baltic countries; Poland, Belorussia, and the European part of Russia (see p. 228).

Bell Beaker Europe is used in chapter 5 to refer to the Western Europe, British Isles, Central Europe, and the western part of the Balkans (see p. 228).

Kurgan Europe is used in chapter 5 to refer to Romania, Moldova, and Ukraine.

Gedrosia is used in chapter 5 to refer to Iran, Pakistan, Afghanistan, and Tajikistan. Gedrosia can be perceived as the original home of the Indus Valley culture.

Extended India is used in chapter 5 to refer to India, Nepal, and Sri Lanka. Extended India can be perceived as the newer home of the Indus Valley culture after the collapse of the Indus Valley cities.

Indian Subcontinent is used in chapter 4 to refer to India, Nepal, Pakistan, and Eastern Afghanistan.

Indus region is used in chapter 4 to refer to the Indus Valley and its immediate neighboring regions, including Eastern Afghanistan. The inclusion of Afghanistan is important, as it offered a connection from the Indus River to the Amu Darya River, which flowed towards the Caspian Sea.

Sundaland was the Southeast Asian continent that submerged to the sea after the Ice Age due to the raising sea level. In this book, Sundaland is used to refer to Indonesia, Malaysia, Philippines, Papua New Guinea, Micronesia, and Micronesia (see p. 228).

⁴³ For example, the ArcGIS system, which was used to calculate the likely movements of bobcats in their natural habitat

1.6 Inheritance, urform, and urheimat

Inheritance is the process, in which a replicator receives its form and content from one or more replicators, or in which an interactor receives its form and characteristics from one or more parent interactors. In cultural evolution, memes inherit their form and meaning from one or more parent memes, and memeplexes inherit their structure and memes from one or more parent memeplexes, or from a large unstructured pool of memes. Large memeplexes like languages and cultures tend to receive large amounts of memes from several parent systems, which may be interactors (e.g. civilizations) or replicators (e.g. cultures). Therefore, the perception of one single mother language or mother culture is subjective and biased unless one can show that the language or culture has received little foreign influence. Smaller cultural replicators that appear at the level of memes or very simple memeplexes may appear in *lineages*, in which each replicator of the lineage has inherited its form from one single parent form. Yet, even small replicators such as words and concepts may inherit their form from several parents: For example, the word *Spanglish* has inherited its form and meaning from the words *Spanish* and *English*. The inheritance from several parent replicators is a phenomenon that appears also in the field of folkloristics. *Stories* and *tales* may inherit narrative elements like protagonists, places, and events from several earlier sources. Some autobiographies, for example, tell interesting stories of the past of the autobiographer, however, including to the autobiography some interesting events that occurred actually to completely different persons.⁴⁴

Urform is originally a folkloristic concept, which refers to the most authentic and original form of a folktale or joke, which can be deduced by the comparative method of folkloristics. This method is based on the assumption that all stories that are similar to each other, have originated their form from an earlier mother form or ancestral form,

which is called the urform. According to the DH theory, *urform* is the most original and authentic version of a replicator that probably existed at the earliest point of the selected historical or prehistoric period. This definition expands the concept to all replicators (including viruses), and clarifies the time span of the urform, so that older urforms are no longer searched for after reaching the starting point of this period. The search of urforms may require different methods in different fields of science, but a general principle is that the search for the urform of a large replicator set or memeplex is unfruitful because larger replicators consist of many memeplexes and memes, and each of them may have several parent replicators. Examples of small cultural replicators whose urform can be searched for include viruses, ecofacts, artefact styles, words, names, statements, arguments, beliefs, rules, norms, poems, jokes, and descriptions persons, places and events. Based on this, the study of the urform of the Omicron variant of the SARS-COV-2 virus might be useful, and it would be reasonable to study the urform of a mutated and corrupted poem, which has lost its rhymes. However, the search for the original and authentic urform a long folktale that appears in many versions is not equally fruitful, as storytellers may have combined elements from several other stories into the folktale. The only fruitful way for studying the urform of larger stories is to paraphrase and condense them into *core narrative elements*, and then study the urforms of these core elements.

Proto-language is the ancestral language from which a group of relatively similar languages has inherited its phonetical, morphological, and grammatical features, and its vocabulary. They are the *urforms* of the later languages that inherited their features of the proto-language. As proto-languages are large memeplexes, it is difficult to define their urform, unless they are first reduced into their core vocabulary (avoiding loan words).

Urheimat is commonly defined as the original geographical area where a proto-language was spoken⁴⁵ or where the urform of a folktale was

⁴⁴ For example, the autobiographical story "Papillion" by Henry Charrie was probably constructed in this manner.

⁴⁵ In linguistics, the concept of an urheimat is defined as the primeval habitation of people, especially the prehistoric

told.⁴⁶ It is based on the assumption that each language and folktale has only one proto-language or urform. In the DH theory, *urheimat* is defined as the geographic origin of a replicator. If the urform of the replicator R has been deduced, then the *urheimat* of R is the location where the urform first existed. If the *urheimat* of R has been deduced, then the urform is the form in which R originally appeared in its *urheimat*. The methods for identifying the *urheimat* of a cultural replicator are described in chapter 4.

1.7 Variation, selection, and the detailed success factors of cultural replicators

Cultural replicators can change due to the addition, removal, or alteration of one of its parts, or due to a holistic change that occurs above the level of parts. Examples of holistic changes are the change of format (e.g. from spoken to written or from mental to material), and the translation of a linguistic replicator or computer program from one language to another. All of these changes may occur *mechanically*, based on mechanic principles, or *cognitively* based on cognitive processes that relate to the interpretation, memorization, replication, and intentional reformulation of the replicator. If cognitive processes are modelled and coded, then they become mechanical processes, which can be used for simulating cultural evolution. According to DH theory, small changes are more likely than big changes at all levels of hierarchy of replicators. This means that the fecundity of similar variants is higher than the fecundity of very different replicators. After additions, removals, alterations, and holistic changes have caused variation to replicators, the processes of socio-cognitive selection and natural selection will have their effect, rooting out the least competitive replicators and promoting the spreading of the most competitive ones.

Variation of cultural replicators occurs via unintentional mutations, via small intentional

changes, and via bigger changes that may be intentional or unintentional.

Natural selection reduces tends to root out those cultural replicators that severely reduce the growth capacity, longevity or fecundity of the interactors that carry these replicators (see 1.2). Yet, somewhat harmful replicators may survive in natural selection, if they are cognitively attractive. An example of this is the *fashion of taking selfies in dangerous places*. Although this fashion reduces the likely longevity of the proponents of this fashion, the selfies of dangerous places may be socially so attractive that the fashion goes on. At the same time, natural selection favors those replicators that increase the survival and growth of their carriers, give them an economic or military advantage, or induce the accumulation of power resources to the interactor that carries these resources.⁴⁷ This means that natural selection induces the development of systems in which resources are accumulated to some social interactors, which then gain more power, which lets them accumulate resources even more effectively. Therefore, natural selection tends to favor those cultural replicators that increase the power of their carriers compared to the power of rival social interactors. In this prediction, the social interactors may be social classes, neighboring social interactors, or rival companies on a market (see Nelson & Winter 1982).

Cognitive selection is a complementary selection process that steers cultural evolution in addition to natural selection. It means the selections that interactors make between alternative replicators or between alternative actions. Yet, the cognitive selection can also occur at the level of organizations. Let us take the face mask related decision-making in the beginning of the corona virus pandemic as an example (see Harlin et al. 2021). First, the decision makers in the public health organizations needed to decide what scientific conclusions they wished to adopt, making a decision roughly between “*face masks are useful*” and “*face masks are useless*”.

homeland of the speakers of a protolanguage ([Dictionary.com](https://www.dictionary.com) 2022-04-30).

⁴⁶ *Urheimat* in comparative folkloristics: The region from which a folktale or a theme originated from (e.g. Krohn 1971).

⁴⁷ For the connection of the power resources to natural selection in general, see Malmi (2009, p. 71–81). In archaeology, this topic has been studied by Blanton & Fargher (2008), and in economics, by Nelson & Winter (1982).

This is a selection between two alternative replicators (beliefs). After this decision, the decision makers need to select between “*to recommend face mask usage*” or “*not to recommend face mask usage*” to people. This is a selection between two actions, which may be classified as performative replicators. The inclusion of cognitive selection into DH theory means that cultural evolution is not perceived as a deterministic environment driven process in which people would have low agency.⁴⁸

Cognitive selection, as humans do it, is studied within the fields of cognitive psychology,⁴⁹ administrative sciences,⁵⁰ political science, and in the study of consumer behaviors. Sciences like economics, operations research, and game theory are focused more on how decisions *should be made*, than how they are actually made by consumers, organizations, and societies. The effects of cognitive selection to cultural evolution appear relatively rapidly. For example, if a cultural replicator goes out of fashion, it may generate a chain-reaction of decisions, which makes the replicator become rare very rapidly. In a similar fashion, new and highly attractive meme can rapidly spread all over the world due to the spur of decisions made by millions of people.

Socio-cognitive learning is a process, during which a social interactor learns from the consequences of past decisions, develops new knowledge via research, or copies cultural replicators from other social interactors via imitation, plagiarism, or espionage. Socio-cognitive learning is studied by archaeologists and historiographers who study the evolution of innovations and technologies,⁵¹ cognitive scientists and pedagogues who study the ways in which people learn, and by administrative scientists and evolutionary economists who study the ways in which organizations learn.⁵² In all of these cases, there is a feedback loop from the consequences of a decision to the popularity of the memes, which are perceived as the cause of this harm or benefit. A society may, for example, learn that people should not construct houses close to the

beach, as sooner or later a tsunami will come, wiping away the families that live in them. Whereas cognitive selection is a rapid process, socio-cognitive evolution may take years, decades, or centuries.

The processes of variation, selection, and learning vary in different fields of human life, and the methods used for their study vary in different fields of science. Yet, it is possible to make some generalizations concerning the way in which variation and selection function in cultural evolution.

General predictions concerning the evolutionary success of cultural replicators

According to the DH theory, natural selection favors cultural replicators that have a high level of longevity, fecundity, fidelity, and combinability, and which are carried by higher-level interactors such as organizations, communities, societies, and civilizations. In addition, natural selection favors small and simple replicators that belong to several larger replicator structures, and larger replicators that contain a small and crystallized core, which may survive unchanged, although its connected and peripheral parts change (p. 14). These predictions, however, need to be elaborated by predictions that relate to the principles of socio-cognitive selection. Intelligent decision makers such as individual humans tend to promote replicators that are *coherent, easy, beautiful, intriguing, beneficial, attractive, or compatible* with other replicators, out of which the *metamemes* are the most important ones. In addition to this, socio-cognitive selection and natural selection together favor *storable, self-corrective, modular, and diversified* replicators. Those cultural replicators, which have these properties, are likely to have a higher longevity, fecundity, fidelity, and evolutionary success than their allele replicators. These success factors and their long-term effects are summarized in Table 2 (p. 32).

⁴⁸ Agency, see Rehnfrew & Bahn (2012, p. 476) and Bourdieu (1972 & 1990)

⁴⁹ E.g. Newell, Lagnado & Shanks (2015)

⁵⁰ E.g. Herbert Simon (1951).

⁵¹ E.g. Szabo & Bereczkei (2021)

⁵² For example, Nelson & Winter (1982) and Starbuck (2017)

Table 2: The success factors of memes and discourses

#	Success factor →	Immediate effect to the cultural replicator	Benefit to carrier interactors	→ Long-term effect
1	Coherent and simple → Easy to understand, memorize and communicate	Increased attractiveness and fecundity; higher longevity in memory	Potential benefits (or harms)	Low risk of degeneration of the meme or discourse
2	Non-coherent → Intriguing			
3	Beauty and self-correction			
4	Beneficial to the carrier interactors	Increased attractiveness	Increased growth, longevity, and fecundity of the interactor	Cultural replicator becomes more common; Reduced chances of extinction of the interactor and the meme/discourse
5	Compatible with attractive memes and discourses and with the epistemological metamemes of the culture	Increased attractiveness	Maintenance of cultural cohesion	
6	Codified into writing or other format that allows for easy reproduction and migration	Increased fidelity and longevity	Long-term storage of larger memes and discourses	Lower risk of degeneration of the meme or discourse
7	Verified with the help of fidelity techniques (e.g. repetition, rimes, tunes)	Increased fidelity, higher longevity in memory		
8	Compatibility and Combinability	Versatility for many different discourses and interactors → Diversification of the replicator to different cultures and regions		Lower chance of extinction of the meme or discourse

Attractiveness of a cultural replicator depends on how *coherent*, *easy*, *beautiful*, *interesting*, *beneficial*, and *compatible* it is. The prioritization between these criteria is determined by the *metamemes* (p. 21) of the social interactor and by the genre of the replicator.

Coherence means that a replicator matches the social standard for this specific replicator, or that it is coherent with some socially accepted higher-level memeplexes. For example, if there is only one

correct manner to pronounce a word, then the incorrect variants of this pronunciation are not coherent with the correct manner, which normally makes them less attractive. An example of coherence with higher-level memeplexes is the pre-archaeological belief that *world was created around year 4000 BC*. Although not coherent with fossil evidence, this belief was coherent with the Bible, which made it a viable cultural replicator for some decades.

Easy cultural replicators are more easily understood, learned, and memorized than difficult ones. They also have higher copying fidelity during communication, and their fecundity tends to be high, as easy memes are considered more attractive than complicated ones, unless the metamemes suggest otherwise. The requirement for memes and discourses to be easy means that large replicators tend to be simplified, ignored, or forgotten. This applies to long stories, long descriptions, and long names. For example, names like *Atlantis* are more likely to survive in cultural evolution than names like *Äteritsiputeritsipuolilautatsijänkä*, which is the longest place name in Finland. The preference for simple replicators applies even to scientific theories and research reports, which tend to lose their assumptions, disclaimers and references when being communicated to the public via the media (Harlin et al. 2021, 33). The need for memes and discourses to be easy to communicate means that constellations of memes such as mental maps tend to get mutated or truncated, unless they are drawn into physical maps or written into route descriptions. For example, if we assume that a place called *Atlantis* once existed, its *name* is more likely to survive in cultural evolution than its *location*, unless the location of this place is stored into drawn maps or into clear route descriptions. When applied to stories, this principle implies that short and condensed stories, on average, survive better in cultural evolution than long ones. For example, many people remember the core of Plato's story of Atlantis from the short version he presented in *Timaeus*, but the longer version that was presented in *Critias* is known to very few

Beautiful replicators are attractive due to their beauty, and they may survive in cultural evolution even if they do not produce any material or social benefit to their carriers. Rhymes and rhythm increase the beauty of memes and memplexes, and makes them easier to remember. The beauty of replicators is especially important, if the replicator does not have a meaning, or the meaning is unknown. People, for example, may select a beautiful name for their child without knowing its

meaning. The beauty of a replicator may be based on its peripheral parts, for example, on its intertextual appearance on some other contexts, which raise positive or touching emotions. An example of this is the short rhyme *Hocus, pocus, filiocus*, which contains a rhyme and which communicates feelings that relate to mystical, secret knowledge and magic. The core of this rhyme has survived in cultural evolution due to its rhythmic beauty and magical connotation, although this older version has commonly been truncated to *Hocus, pocus* in the Anglo-American culture, and although its meaning has shifted to "Trickster magic". The parts of this rhyme seem to have beauty also on their own, as they still appear as anthroponyms Hocus/Hocus and Pocus/Pocus, and possibly in the altered form Filiok/Filioke.

Intriguing replicators are easy to notice and memorize, as they raise attention and curiosity, and challenge their audience to ponder about an embedded puzzle. All of these features make intriguing replicators easier to remember. Examples of intriguing replicators include incredible, mysterious, controversial, shocking, and politically incorrect replicators such as rumors that relate to well-known persons, peoples, places or events. An example of an intriguing replicator is the condensed and paraphrased version of Plato's story of Atlantis: "*Atlanteans were an advanced marine civilization, which attacked Greece in vain, very long time ago. Their capital, Atlantis, sunk to the sea soon after the war.*" It is intriguing, as the sinking of a capital sounds somewhat incredible, and as the story puzzles its audience by leaving unclear the location of Atlantis.

Beneficial refers to the benefit that the *subjective* benefit that an interactor perceives in the context of cognitive selection, or to the *material* benefit that a replicator causes to the growth, health, and longevity of its carrier in the context of natural selection. The growth rate and longevity of a social interactor depends on its ability to gather and accumulate economic, military, and symbolic power resources.⁵³ In cognitive selection, people normally

⁵³ In archaeology, the importance of economic and military power, and ideology have been studied, for example, by Earle

(1997), who studied the role of these factors in the emergence and maintenance of chiefdom.

select those memes that are beneficial for themselves or for their family, unless the society has established metamemes that promote behaviors that are beneficial for the society, or for the rulers and elites of the society. The way in which people weight the benefits that are caused to different stakeholders depends on prevailing metamemes. In authoritative, nationalist and collectivist societies, people are trained to prioritize the well-being of the society or state over their own well-being.

The benefits of cultural replicators depend on their topic and genre, and on the metamemes of the society. In the genre of *realistic replicators* (e.g. non-fiction), the accuracy, validity, correspondence with reality, and credibility of the author, tend to increase the potential benefits that the replicator can give to its appliers and distributors. These characteristics may also reduce the risks of applying the replicator. The potential benefits of a replicator depend on the topic and application area of the replicator. Let us take mental maps, route descriptions, and travel stories as an example. In an illiterate culture or an early literate culture, there may not have been a tradition of drawing maps and making copies of them. This means that routes usually needed to be inferred from travel stories. Although the descriptions in these stories may be inaccurate, they may induce a high level of expected benefit if they describe the route to a location that contains valuable resources. Due to this, stories like *El Dorado* have motivated explorers despite their very vague descriptions of routes. Although correspondence with reality is an important success factor within the genre of realistic stories, the compatibility of the replicator with the dominant paradigms of the society may be an even more important success factor. For example, it is possible that histories of peoples and countries are rewritten in a fashion that replaces the older and more realistic version with a politically correct one. In the genre of *fiction and art*, replicators are beneficial for their author, if they are attractive to their audience, which will occur when a work of art is beautiful or intriguing, or when it contains valuable contextual information or a psychological or moral lesson.

Storable replicators appear as material artefacts and constructions, or as codified replicators that are stored onto a material media as an aggregate or inscription, or as an analogical or digital representation. Aggregates can be added to a landscape, rock wall, papyrus, paper, or leather, and inscriptions can be made into sand, wood, clay table, rock, or into an artefact or construction. The replicator, which is aggregated or inscribed into material format, may be a standardized decorative form, symbol, letter, or a word. Artefacts and constructions consist of their form, inscriptions and aggregates, their bill of materials, and of their inferred function and production method. If a replicator is stored into a stone pillar, construction or landscape, it can travel in time to future generations, but it cannot migrate horizontally except for in those rare cases in which the construction is deconstructed and then moved to a different geographical location. Smaller artefacts, such as tools, clothes, accessories and books, can easily migrate to new locations with their owners, but their replication will still require that their bill of materials and production method is first inferred from the object on a rough level, and then discovered on a detailed level after trial and error. In addition, the materials of the artefact need to be available in the new geographic area, in order for the reproduction of the artefact to be successful. A special case of storable and yet mobile artefacts are ecofacts, which are stored into the genes of domesticated animals, plants, parasites, and microbes.

The evolutionary success of artefacts, features, and ecofacts depends on their beauty and benefits, and on their ease of manufacturing, which may depend on their compatibility with the technologies that are available for the social interactor that is trying to reproduce the artefact or construction. *Homo sapiens*, *Neanderthals*, and *Denisovans* developed tools, clothes, and accessories much earlier than they developed languages. This means that cultural evolution was mostly a process for replicating artefacts and decorations, until spoken language and signs were invented.

Self-corrective replicators contain a mechanism for identifying and rejecting mutations. All cultural replicators can be somewhat self-corrective if they are circulated in a community of intelligent communicators in such a fashion that each communicator is likely to have observed the replicator in several instances. In such a context, most adult members of the community are able to distinguish mutated and corrupted versions of the replicator from the correctly reproduced ones. This *law of self-correction*⁵⁴ will reduce the incidence and popularity of mutated versions. Self-correction occurs especially in the evolution of such stories that are considered valuable sources of information. Even in the genres of rumors, tall-tales, and fiction, the law of self-correction is likely to occur in order to fix mutations in those supposedly realistic motifs of the story, which tell about such real persons, places, and events that are mentioned also in many other stories.

A more specific method of self-correction is *standardized structure*, of which the cognitive gadgets like *paraphrasing*, *rhymes*, and *checksums* are examples. The rhymes help notably in the distinction of a correct version and mutated version from each other, even in those cases in which the mutated version is more common.⁵⁵ Paraphrasing means the repetition of the same information content, in different paraphrases. The poems of the Finnish *Kalevala* make use of both paraphrasing and rhymes. A third method of self-correction is calibration, which may occur when the replicator is a simple concept or memplex, which has a matching counterpart in reality. For example, the calibrator of the color *orange* is the fruit of the orange tree. The self-correctivity of a replicator will disappear, if the carrier of the replicator moves to a new region or culture where the calibrator does not exist.⁵⁶

Compatibility of a meme means that it matches with the other cultural replicators of a social interactor, out of which *metamemes* are the most important (see p. 21). Compatibility means that a replicator is either coherent with other cultural replicators, or neutral and easy in such a fashion that it can be easily combined with other memes. Compatible replicators are more likely to be accepted, learned, and memorized. If a replicator is compatible with the attractive and popular higher-level discourses of the society, this will increase its attractiveness and fecundity, and reduce the risk of social punishments to its carrier. On the long term, compatibility with all kinds of discourses improves the survival chances of the meme in cultural evolution by letting the meme diversify to several higher-level discourses, interactors, and regions. For example, the meme, according to which “*Atlas was our mighty ancestor*”, will survive better if it spreads to various stories of *King Atlas* and *Titan Atlas* so that these stories are then told separately within the Mauretanian, Greek and Middle Eastern cultures.

Modularity is a general success factor of all replicators. If a large replicator is not modular, even a small copying error will corrupt the entire copy. However, if the replicator is modular, only one module will be mutated, and may possibly be recovered by the methods of self-correction. If a smaller replicator is not modular, it is not likely to connect easily to larger replicator structures, meaning that it is not compatible with them. Due to this, modularity appears at almost all resolution levels of cultural replicators: Large stories are made of parts, and each part may be divided to sub-narratives that contain narrative elements, which consist of words, which consist of phonemes and graphemes, which consist of letters and sounds. Modularity speeds up cultural evolution, as all replicators on all resolution levels can compete

⁵⁴ See Wolf-Knuts (1999), and Anderson (1923), referenced by Bronner (2007, 168)

⁵⁵ For example, there are two competing versions of the Finnish childrens rhyme *Lennä leppäkerttu* (“Fly, ladybird!”). The mutated version is “Lennä, lennä leppäkerttu ison kiven juureen, siellä isäs äitis keittää sulle puuroo” and the original version is “Lennä lennä leppäkerttu ison kiven *juureen*, siel on sulle keitetynä puuroo kuppiin *suureen*”, in which the italics show the rhymes.

⁵⁶ For example, the Lapp concept *poronkusema* means the distance that a reindeer can run without urinating. Although this concept is measurable, its meaning is not likely to survive in cultural evolution without major mutations, once the concept moves away from the area where reindeers are used as a means of transportation (for pulling sledges), or when it is passed to new generations that no longer use reindeers as a means of transportation.

against their allele versions and variants inducing simultaneous evolution at all levels of human knowledge. Modules and parts are not just a property of a replicator, as modularity of replicators is partly an interpretation of the observers and communicators of replicators. For example, the word *organization* will be interpreted by an English person as a 5-syllable word, but a Finnish person will perceive it as a 6-syllable word *or-ga-ni-za-ti-on*. This means that syllables are not the property of the language of the word that is pronounced or written. Instead, they are an interpretation of the way in which a word should be divided to parts when interpreting, pronouncing, or writing it. This is important for the study of opaque loan words, for which we do not know their cultural origin.

Diversified cultural replicators are replicators that have diversified along the following dimensions:

1. to several geographical regions
2. to several environmental niches
3. to several populations
4. to several higher-level replicator structures such as discourses, languages and cultures

If a replicator is able to diversify along all these dimensions, its chances of survival on the long term will increase substantially, although it may survive only in some variant of the original replicator, not as an exact copy. If a replicator diversifies into many populations or cultures that are connected to each other by occasional migrations, the replicator may become very resistant to extinction. Let us take the evolution of names as an example. If the personal name *Atlas* diversifies to several geographical regions, populations, cultures, languages, and stories, it will be resistant as it is no longer a language-dependent name. Although the phonology of all languages changes over time, a name that is very diversified will continue its existence in some regions, populations, and cultures although it may be replaced by a phonological variant in some specific culture. As the populations are connected by occasional migrations, even this culture (in which the name became extinct) is likely to receive the original name into its name pool again, along with migrants.

For example, the translation of stories may cause significant translation errors and misunderstandings, which cause the form and meaning of stories to change. Although this can occur for large replicators such as stories, also smaller sentences can mutate so much that the original meaning can become obscured, and in addition, mutations may change the genre of the story.

1.8 Integrating natural selection and socio-cognitive selection

Cultural evolution is governed mainly by socio-cognitive selection that works on cultural replicators, but a big part of it is still governed by natural selection that has its effect on genes, cultural replicators, and social interactors. Figure 3 on page 37 intends to capture the complexity of cultural evolution, including the main feedback loops that drive it. The blue color in the diagram highlights those parts of the process that can be perceived as socio-cognitive, whereas the brown color means processes that belong more to the domain of natural sciences and evolutionary economics. The dotted lines show the feedback loop from evolutionary stress to the epigenetic activation of genes. One process that is not illustrated in the diagram is the connection from metamemes to the fecundity of the social interactor via strategy: Some social interactors are more focused at growth, while others are more focused at starting new, autonomous subsystems to new geographical locations.

The DH theory has some similarity to *practice theory*, according to which cultural replicators are *social structures* that are *reproduced* from generation to another by agents (interactors). Both approaches also share the idea that mental ideas have an effect on customs and material things, and that material things have an effect on the ideas and habitus of people. Yet, the DH theory provides different tools for the analysis of the different types of cultural replicators and for the study of the related transformation, learning, socio-cognitive selection, and natural selection processes.

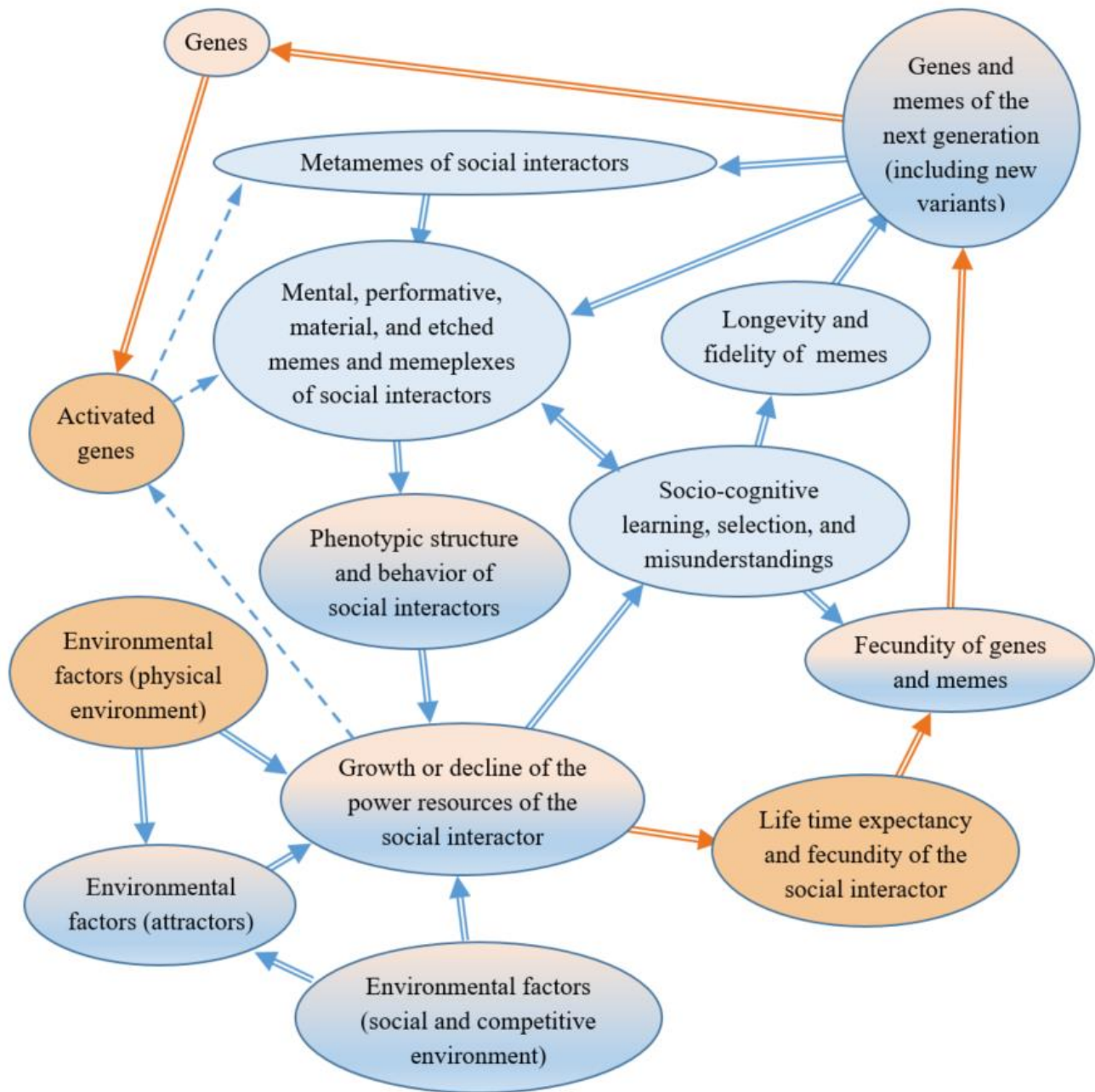


Figure 3: The effect of natural selection and socio-cognitive selection on cultural evolution

1.9 Stages and cycles of cultural evolution

According to *cultural evolutionism*, cultures develop from primitive forms, such as hunter-gatherer cultures, towards higher forms, such as organized and hierarchal states.⁵⁷ According to the DH theory, this is a gross simplification. The first

error of cultural evolutionism is to confuse interactors and replicators with each other. According to the DH theory, human cultures are replicators and not interactors. This means that primitive cultures, which are replicators, cannot evolve into states and civilizations, which are interactors. In addition, cultures emerge, evolve, merge to each other, and disappear due to a multilayer process, in which there

⁵⁷ E.B. Tylor (1832 – 1917) and L.H. Morgan (1818 – 1881)

are no definite starting points and end states. Therefore, a better way to perceive the “stages” of cultural evolution is to see them as:

1. *Cycles* of development
2. *Attractors* and modalities that are likelier than some other system stages are
3. *Alternative strategies* that social interactors may apply based on their metamemes.

Although cultural evolution is not deterministic, natural selection still causes some cycles, attractors, and strategies to be more likely than others are. This is caused by the mechanisms shown in Figure 3 (p. 37).

From introverted to expansionist

Natural selection favors replicators that make their carriers open and expansionist instead of being introverted and localist. This is caused by the faster accumulation of knowledge and skills to the populations of open and expansionist interactors compared to introverted and localist interactors. This prediction applies to all of the following types of interactors:

1. Biological populations (e.g. *Homo sapiens* versus Neanderthals and Denisovans)
2. Tribes and city-states (e.g. Romans versus Etruscans)
3. Kingdoms and empires (e.g. British Empire versus the feudal Japan of the 19th century)
4. Enterprises and brands (e.g. IKEA versus some local furniture manufacturer)

The open and expansionist interactors engage into harder and more frequent competition on the military, scientific, and economic sectors, and therefore outperform their introverted local competitors on the long term. Although some open and expansionist interactors perish in this competition, the memplex that promotes expansion and willingness to compete outside one's own region will flourish. A consequence of the likely victory of the open and expansionist interactors is the decline in the relative frequency of all those

genes and memes that were carried (only) by the introverted and localist cultures.

From Peaceful to Assertive

When social interactors are in contact with each other, they may apply peaceful, aggressive, or assertive behaviors. These behaviors are governed mainly by the metamemes of the interactors, although genes and hormones may also have some effect. Evolution of these behaviors follows a stage model, in which all interactors are peaceful in the beginning, assuming that there is enough space and natural resources around them. When the population size increases and the distance between different populations shortens, aggressive behaviors and the threats of violence tend to produce a benefit to the interactors that apply them. This will increase the relative frequency of aggressive interactors, until the frequency is so high that aggressive interactors are at the risk of fighting each other to death (Axelrod 1984). Once this balance has been reached, it is likely that at some point a new assertive strategy will emerge. The principle of this strategy is the following: *If you are peaceful or assertive, I will cooperate with you, but if you are aggressive, I will defend myself.* After this development, this assertive memplex and its variants will tend to become more common than those memplexes that promote purely aggressive or purely peaceful behaviors. This principle of natural selection means that submissive and fully pacifist social interactors are not likely to survive on the long term in cultural evolution. Pacifist and submissive ideas, however, may be emerge recurrently in cultural evolution.

From simple to complicated and back

In the evolution of human societies, there is a process cycle, in which *Introverted Localism* is replaced by *Open Expansionism*. Consequently, some aggressive conquests produce an empire. This empire then becomes too complicated, and has too many layers of hierarchy and too many functions and professions that are too highly specialized. One elite may obtain too many privileges or there may be too many competing elites. War is “outsourced”

to professional soldiers and mercenaries. These complications of the empire make it vulnerable to sudden external disturbances: If the funds of the empire are exhausted, its military might collapses, as common people cannot be effectively drafted and trained fast enough. The economic and military might of the empire may also be undermined by the excessive usage of natural resources. All of these complications will then lead to a situation, in which the external disturbance can no longer be handled by the empire. In addition, the empire may collapse in a revolution or in a civil war that is caused by the unequal division of wealth and power within the Empire. During these moments of weakness, separatism will lead to the autonomy and independence of some regions that formerly belonged to the empire. This means that the complicated structure of the empire is replaced by the simpler structures of the regional social interactors.

A parallel process to the emergence, flourishing, and collapse of empires is the emergence of smaller settlements, city-states, and kingdoms, which will defend themselves successfully against other opponents of their own size, and which will surrender to clearly superior powers when needed. The defensive power of these cities is increased if they make alliances with other cities of the same culture, and with some of their potential opponents. This strategy was successfully applied by the Canaanites and Phoenicians 2000–330 BCE, and by the Greek city-states 800–330 BCE, until the growth of the Macedonian Empire.

The same development from simple to complicated and back tends to occur also in the evolution of enterprises. A typical cycle is that a private enterprise grows to a large diversified corporation of thousands of employees, and then creates many functional departments that serve the hierarchal organization. This creates a too big and complicated structure, which is then simplified by 1) adopting a multidivisional structure, 2) converting some departments into independent subsidiaries, and 3) selling those subsidiaries that they do not consider as part of their core business.

From violence to introverted xenophobia via free trade

One more cycle of cultural evolution is the construction of empires and large alliance networks based on violent and assertive behaviors, creating an open market on which products, services and regions compete against each other. This open interregional competition may produce benefits to all participants, as all regions can focus on the production of those products that they can produce at higher quality or lower cost than other regions. This will usually launch a period of flourishing capitalism, which will lead to the accumulation of economic resources to some regions, kingdoms, organizations, and entrepreneurs. The system of free trade, however, is vulnerable to collapse due to its complexity: All parties depend on all other parties. If a war or catastrophe cuts off trade routes, then all regions that are specialized into the production of one single product, will have to learn rapidly (from zero) the production of all other goods, as they can no longer purchase them via the interregional markets. This may lead to the rapid deterioration of specialized knowledge in all former participants of this large system of interregional trade. The rapid economic and cultural decline in the system is likely to cause wars and violence, and many social interactors are likely to adopt localist, defensive, and xenophobic memes.

Another process that may lead to localism and xenophobia is the unequal distribution of wealth in a capitalist system. This may lead to the request for tolls and bans for foreign products. In addition, the unrestricted movement of people from one region to another may lead to requests for limiting entry, and for favoring the current citizens.

An example of the birth and collapse of a flourishing system of free trade was the birth of the Bronze Age trade network in Europe after the violent Yamnaya invasion. This system of free trade collapsed, at least in the Eastern Mediterranean region, to the attacks of the intensification of wars and raids 1210–1150 BCE. These attacks cut off the trade routes and were a major cause for the Late Bronze Age collapse.

From equality to male dominance and back

Although the relation between the genders has had many variants during the history, it is possible to identify some tentative stages in the evolution of the gender system. The main components of this system are the memplex of femininity, the memplex of masculinity, and the social structures that maintain the distribution of power resources among men and women.

During the early stages of cultural evolution, population density was low and the populations were not connected to aggressive competing populations. Due to this, it was possible that peaceful cultures were more common than aggressive cultures. In addition, the limits of the ecological carrier capacity of the environment had not yet been met, which meant that *fertility* had a purely positive connotation. This promoted societies in which women and men were equally valued. Fertility goddesses and female priestesses were common. In addition, the abduction of spouses and slaves would have been relatively uncommon. Yet, some violence and conflict within tribes may have occurred.

At the next stage, the emergence of expansionism and aggressive competition changed these peaceful cultures of gender equality to more aggressive or assertive, and women's status deteriorated. A common outcome seems to have been a culture, in which men do war, and women are either trophies of war, or something that must be protected from war. Yet, in many cultures women participated actively to the defense of the tribe.⁵⁸ This was promoted by the fact that a large proportion of women were strong enough to use bow and arrow to kill attackers who did not wear armor.⁵⁹ In addition, women who had to rule their family, farm, and servants during the expeditions of their men, needed to learn self-defense at least to some extent. The role

of women was not so limited in all societies, as the narrow focus on the Greek, Roman, and feudal European societies would suggest. During several periods of history, some cultures have offered women the choice between family life and a life as a warrior and military leader.

After the development of several monotheist religions in the Near East, the discourses that related to femininity changed. Fertility goddesses were replaced by monotheist interpretations of one almighty male God. Female priestesses of fertility were reinterpreted as prostitutes. Women were pictured as guilty of the “original sin” and as guilty for the banishment of people from the paradise. This discursive reformulation led to the weakening of women's status, especially when combined with an environment in which aggressive social interactors, wars, and raids were common. The development of iron plate armor reduced the chances of women to act as successful warriors, as fighting with a heavy armor and the piercing of the armor of one's opponent both required more strength than most women had.

During the 20th century, the status of women improved again in many countries. This was mostly caused by the active work of feminists and equalists, but partly by natural selection and socio-cognitive learning: Those societies that were able to use women as soldiers and as workers in “men's works” had the best resilience during the wars of the period. This process continues in the corporate world, in which companies that are not able to utilize the full potential of women, are likelier to lose market share than their more egalitarian rivals are. A minor cause for the improvement of the status of women has been the invention of firearms, which made it possible for women to fight at wars without carrying heavy armor.⁶⁰

⁵⁸ Steppe People used women as mounted warriors already during the Bronze Age, based on the arrows found in female graves ([Davis-Kimball and Littleton 1997](#)). The Scythians and Samartian cultures repeated the pattern of mounted female warriors 700 BCE – 400 CE ([Gale 2023](#)). Trung Sisters raised an army of women and men in Vietnam 40 CE, and defeated the invading Chinese forces ([New World Encyclopedia](#), retrieved 2024-01-13). In the Viking culture, some women

participated in war as “shield maids” ([McRae 2017](#) and [Jesch 2021](#)).

⁵⁹ Based on the archaeological findings at the Steppe, the story of the Amazons might have a grain of truth within, as bows and arrows were very effective in wars before the development of iron armor.

⁶⁰ For example, in Benin, the Dahomey Amazons were an all-female military regiment that defended the Kingdom of

Cultural evolution during the Bronze Age

The previous chapters have intended to present some general processes of cultural evolution that are likely to occur in all human societies. Due to the simultaneous existence of many natural and cognitive selection forces that pull societies to different directions, the outcome of evolution cannot be predicted precisely. Therefore, a clear model for the stages of cultural evolution cannot be presented. Yet, it is possible to apply the presented cycles, attractors, and strategies for explaining the cultural evolution of Bronze Age societies. This is done by analyzing the memplex of *Chieftainship*, which is illustrated in Figure 4 (p. 41). The blue

circles represent the mental memes of *chieftainship*, the yellow ones are performative replicators (processes), and the red ones are material replicators. This memplex combines memes from the memplex of *Violence* (lower part of the figure) with memes of *Economic Growth and Colonialization* (upper part of the figure). A typical order of occurrence is that first, aggressive social interactors force the emergence of assertive behaviors. Then expansionism creates militarily and economically superior social interactors that start to grow and to form alliance and trade networks.

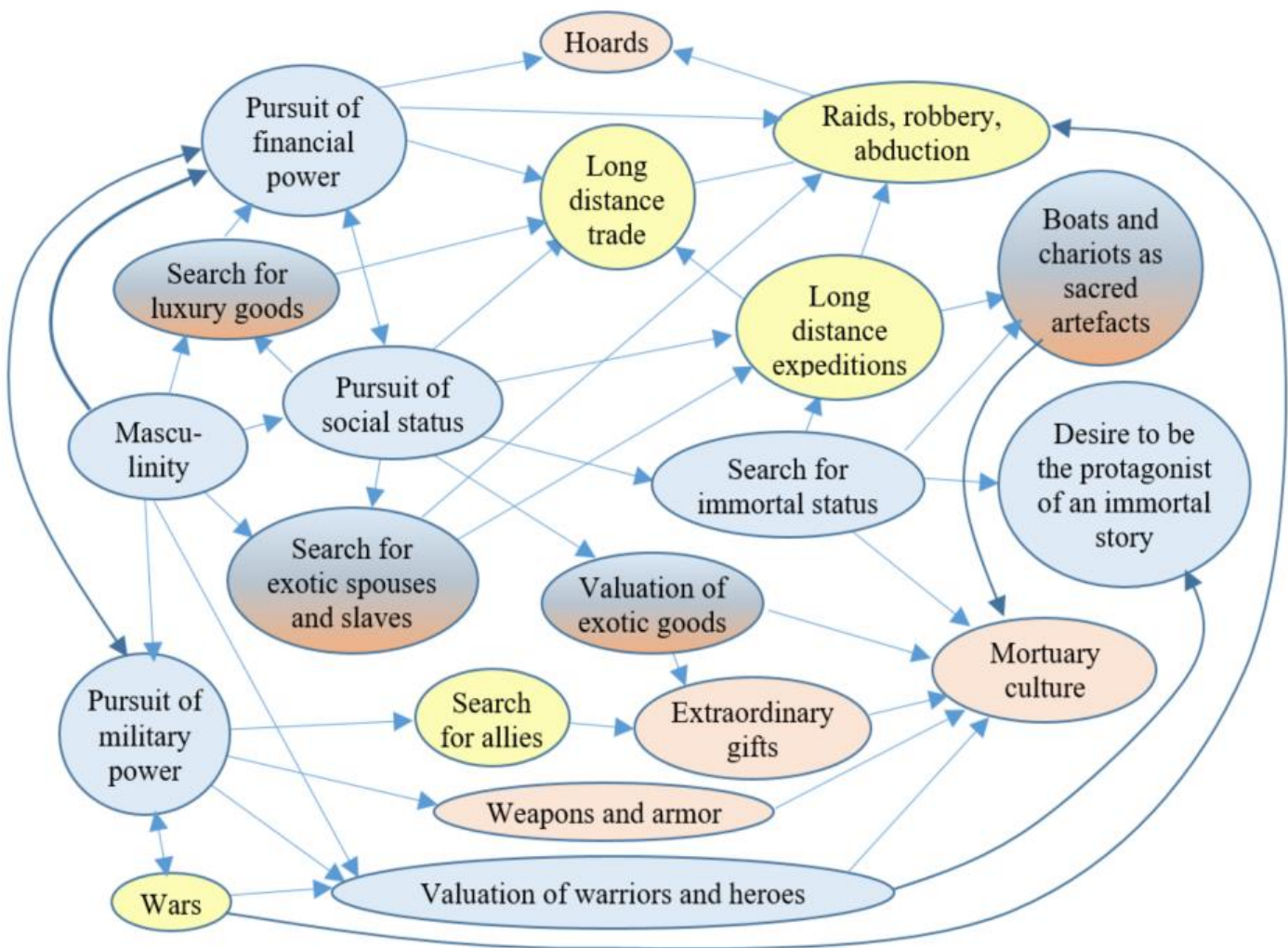


Figure 4: Memplex of *Chieftainship* in its mental, performative, and material format

An example of this development is the aggressive expansion of the Yamnaya tribes, which changed the memplex of all European cultures towards more aggression and assertiveness. After this, a network of alliances and trade emerged, leading to the flourishing market economy in Europe. In this economic system, the European and Near Eastern kingdoms benefited from the continent wide trade routes and from the specialization regions into the production of specific high quality products at an affordable price. The Mycenaean Greeks were an example of a culture that had military might and capacity for long-distance expeditions. The values of the memplex of *Chieftainship* were reflected in the Greek legends, which described the long distance travelling and related adventures of their protagonists (e.g. Odyssey and the story of Jason and the Argonauts).

The strategic and irreversible effect of the memplex of *Chieftainship* was the “shrinking of the world”, meaning the cultural connection of distant regions with each other. This started a new phase in the cultural evolution of Eurasia and Africa during the early Bronze Age. People explored, traded, and migrated over longer and longer distances, and this speeded up the accumulation and refinement of knowledge especially after the invention of rowing boats, and sea-worthy sailing boats. For continental cultures, the taming of horses, chariot, and horseback riding were analogical innovations. The shrinking of the world during the early Bronze Age is shown by burials with non-local grave goods (Kristiansen 2023, 240). One potential manifestation of the memplex of *chieftainship* (p. 41) may have been *heroic tourism*. This phenomenon was constructed on the benefits that were offered by exploration, long-distance trade, and the abduction of slaves. In addition, it brought to its actors knowledge of distant places, tribes, persons, and inventions. All of this increased the military skills, economic wealth, knowledge, and

social status of the persons who participated in heroic tourism.

After the long distance travel had opened the routes, long distance trade followed. As a result, the Bronze Age kingdoms of Europe and Near East formed an interregional panmictic system that speeded up cultural evolution and the development of knowledge. This relatively advanced system collapsed partly during the attacks of the Sea People 1210–1150 BCE and the Trojan War ~1184 BCE,⁶¹ but the Phoenician and the Egyptian cultures continued to flourish. Examples of long distance expeditions and trade have been presented on page 101, and examples of long distance migrations are analyzed in chapter 4 based on genetic data.

1.10 Summary

This chapter presented the foundations of the Dawkins–Habermas theory (DH theory). According to this theory, evolution is a process in which *interactors* inherit, learn, develop, loan, recombine and utilize *replicators*, and copy them to new generations and regions. The evolution of less intelligent animal species is based mainly on the inheritance of replicators (genes), but the more intelligent animals such as human also learn *cultural replicators* from other animals and independently develop and recombine them, passing them to the future generations.

Replicators have intended and unintended phenotypic effects on the way in which the social interactors function, organize themselves, and interact with environments. *Social interactors* can be groups of people, organizations, communities, kingdoms, nations, or civilizations (see Miller 1978 and Hull 1980). The cultural replicators can be small and atomistic replicators such as *memes* (Dawkins 1976) or larger entities such as *memplexes* (Blackmore 2000). Examples of memes include *discursive elements* (Habermas 1984), words, names, symbols, phonemes, artefact styles,

⁶¹ Based on Homer, the Trojan War lasted ten years in the 12th or 13th century BCE [Iliad II-XXIII]. Eratosthenes dated it to years 1194–1184 BCE. According to Baikouzis and Magnasco

(2008), the Trojan War ended shortly before 1178 BCE, which suggests that the war was waged approximately 1187–1177 BCE.

decorations, heuristics, and beliefs. Examples of memplexes include archaeological industries, lexicons, languages, discourses, paradigms, ideologies, religions, rituals, and long stories (Malmi 1988, 1992, 2009, 2021, 2022). Memes and memplexes can appear in performative, mental, etched, material, and taxonomized form.

According to the DH theory, cultural evolution is based on the processes of variation and selection. Variation is caused partly by small unintentional mutations and partly by intentional variation of the cultural replicator. Once a meme has transformed into its variant, or a memplex has appeared in a new version, the natural selection and socio-cognitive selection determine which variants and versions will outlive their competitors. Those cultural replicators that bring a *subjective* or *material* benefit to their carrier on the short or medium term tend to replace those allele replicators that do not bring such a benefit. On the medium term, the survival of a replicator depends on its harm or benefit to its higher-level Carriers, which may be social interactors such as kingdoms or civilizations, or environments. For example, the ideology of *ambitious growth* is not likely to survive in its current environment much more than a thousand years, if it leads to the destruction of the environment. Yet, it may survive in other regions, assuming that the ideology of growth is connected to colonialization. On the long term, the success of a replicator depends on 1) its match with a universal attractor, 2) its ability to be stored into material format, 3) its ability to diversify into many Carriers, and 4) its ability to diversify into many higher-level replicators. For example, the ideology of *ambitious growth* is likely to emerge repetitively in cultural evolution, because there is a universal attractor that favors interactors that are capable of growth. Other examples of long-term survival are the memes that are stored into etched format (e.g. text) or into material format (artefacts or constructions). In these cases, the mental representation of the replicator can be recreated by studying the etched or material replicator so that this replicator can be replicated

based on its mental copy. Consequently, the memes that are stored into material or etched format may survive for very long periods, after which they can again be decoded again into mental format. An example of the benefits of diversification is the idea of *only one almighty god*, which will increase its chances of surviving in cultural evolution every time it diversifies into a new continent or to a new religion.

The migration of interactors and replicators plays a central part in cultural evolution, as it may introduce to local replicator pools some new and potentially highly competitive replicators, which will then replace their alleles. The migration of replicators between two geographic locations can be modelled by Least Cost Analysis, according to which the likeliest migration route is the route that minimizes travel time, taking into account also the travel cost and travel risks.

Cultural evolution is not a process that leads from the primitive to the advanced. Instead, cultures are made of cultural replicators that may sometimes also degenerate. In addition, the supposedly advanced interregional and imperial cultures may also revert to locally oriented introverted cultures, if they close their borders from the immigration of people and ideas, and if they fail to utilize the benefits of long-distance trade.

Although the memetic theory of Dawkins (1976) was a reductionist one, the DH theory is not reductionist as it emphasizes the importance of ideologies and other memplexes. In addition, it highlights the importance of systemic feedback loops that relate to natural selection and cognitive selection (see p. 44). This means that the closest theoretical counterpart of the theory within social sciences is discourse analysis and some Marxist approaches, and within archaeology the DH theory connects to processual archaeology, practice theory, and the traditions that perceive the remnants of material culture as a discourse that needs to be interpreted.

2 Similarity as the key for predicting and inferring cultural evolution

2.1 *Small changes that lead to big cumulative effects*

As noted in the previous chapter, memes and memplexes change in cultural evolution due to mutations but small mutations are likelier than big mutations. In addition, the longevity of a slightly mutated variant is often higher than the longevity of a very different variant. This is partly caused by the *law of auto-correction* (p. 35) and partly by the inability of humans to understand the meaning or function of replicators that have changed a lot. As the fecundity and longevity of slightly different variants is higher than the fecundity and longevity of very different variants, the relatively similar variants will be much more common in cultural evolution at least on the short and medium term. On the longer term, big mutations of a replicator may cause some strategically important effects to its carriers, which may increase the attractiveness and long-term success of the replicator. Yet, on the short and medium term, the cumulative effects of small

changes play a very significant role in cultural evolution. The cumulative effect of small mutations on a meme on the short term is called *shifting* in the DH theory. *Diachronic change* is a slightly wider concept than shifting, as it includes sudden bigger changes of a memplex, in addition to shifting.

In order to predict future evolution or to deduce past cultural evolution, we need to know what memetic changes are small and probable, and which ones are bigger and less likely. Due to this, the purpose of this chapter is to present some general methods for measuring the *similarity* between two somewhat similar cultural replicators, which can be *memes*, *memplexes* or *meme sets* (see 1.3). The measurement of similarity may occur intuitively based on pattern recognition and simple heuristics, or by a mechanistic method using equations, algorithms, and heuristics. Table 3 below characterizes the advantages, problems, ideal application areas, and recommended improvements that relate to the intuitive and mechanistic method.

Table 3: Comparing the intuitive and mechanical methods of estimating the similarity of two replicators

Points of comparison	Intuitive method	Mechanistic method
Basis	Human pattern recognition and simple heuristics	Algorithms, equations, automatable heuristics
Advantages	Very flexible and relatively fast	Very fast when automated
Disadvantages	Lack of transparency, reproducibility, and objectivity	May lead to very accurate similarity measures that are yet meaningless or counter-intuitive
Most suitable areas of application	1) Comparison of two memplexes or memes that fit to the human short-term memory; 2) Comparison of a couple of allele replicators, which cannot be easily measured by attribute-dimensions; 3) Comparison of small and fuzzy memplexes	1) Calculation of the similarities of massive amounts of memes (e.g. comparing to each other all the words of all the languages); 2) Comparison of many allele replicators that can be measured by numerous attribute dimensions; 3) Comparison of large meme sets.
Recommended improvements	Studying the intuitive way that humans use in the evaluation of similarity; then formulate it into clear algorithms and heuristics so that the intuitive method becomes transparent, reproducible, and automatable.	Calibrating the algorithms and equations so that they produce meaningful similarity measures, with which human test subjects can agree with. Identify heuristics that are similar to the heuristics that humans use and develop heuristic algorithms for analyzing variation and similarity.

For example, the similarity of the textual strings *Gadir*, *Kadir*, *Agadir*, and *Gpadir* can be intuitively estimated in just a couple of seconds, and the likely result is that *Gadir*, *Kadir*, and *Agadir* are similar, whereas *Gpadir* is an outlier in this group. Yet, it may be difficult to describe why this conclusion was reached. On the other hand, it is possible to measure the similarities of these names mechanistically with Levenshtein distances (see p. 79) reaching the conclusion that *Gadir*, *Agadir*, and *Gpadir* are very similar, whereas *Kadir* is an outlier. This method is transparent and reproducible, and it can be used for calculating the similarities of millions of words very effectively. Yet, the results are often intuitively invalid or meaningless. Based on this, there is a need to formulate the intuitive rules, which humans use for measuring similarity, into transparent and clear heuristics and algorithms. On the other hand, there is a need to improve mechanistic methods like the Levenshtein distance so that they would yield results that match with the way in which a group of human test subjects would rate similarities in laboratory conditions. The purpose of this chapter is to clarify the ways in which humans detect and

evaluate similarity, and to improve the mechanistic methods so that their results would better match the human estimates of similarity. The target is that the findings and conclusions of this chapter could then be used within various application areas, for example, in archaeology, linguistics, and folkloristics. According to the DH theory, the similarity of two higher-level replicators R1 and R2 can be estimated by delineating them and by dividing them into lower level parts. If the replicators share many similar Features and parts, they are similar, and if they contain many different Features and parts, they are different. While estimating the similarity of parts P1 and P2, this estimation can be done by first dividing them into their lower level parts. These lower level parts may be, for example, simple elements of drawings or symbols, spoken phones, written letters, or adjectives that are found within one single motif of a story. Table 4 below shows a hierarchal model of cultural replicators in order to illustrate that most replicators contain lower level parts and are yet part of some higher-level replicator.

Table 4: The hierarchal organization of cultural replicators in the fields of anthropology and linguistics

Level #	Level of cultural replicator	Archaeology	Linguistics	Folkloristics
5a	Large memplexes	Material culture of region X during period Y	Languages	Stories
5b	Large meme sets	Artefacts found at some geographical region	Lexicons	Large sets of small narrative elements
4a	Fuzzy memplexes	The paintings within one area of a cave	Concepts	All the events that relate to person or place that is mentioned in a story
4b	Delineated memplexes (=larger memes)	A cave painting that shows a man, weapon, and animal	Words	Delineated subset of all the motifs that characterize an event, person or place
3	Parts of memplexes (=memes)	Man, weapon, animal (in a cave painting)	Prefix, core, postfix	One single motif
2	Elements of parts (=small memes)	Elements of the weapon (of the cave painting)	Phones	Parts of a motif

This chapter starts by presenting some mechanistic methods for calculating the similarity of the lower level elements and parts with arithmetic equations. After that, these same methods and equations are applied for the calculation of the similarities of memplexes and meme sets. In all cases, the similarity of R1 and R2 is presented as a percentage that may vary on the range from 0% to 100%. At the end, a Variation Rule based heuristic method is presented for measuring the similarity of small memplexes.

2.2 *Measuring the arithmetic and intuitive similarity of two replicators*

This chapter advances from the simple and compact memes such as phones and symbols to the larger and more complicated replicators such as words, languages, symbol systems, and traditions of folklore. Although linguistic replicators are used here as examples in several cases the more detailed analysis of the similarity of words, names, and languages is done in chapter 3.

Calculating the Distance between R1 and R2 along one single attribute-dimension

According to the DH theory, the Similarity between replicators R1 and R2 is marked as $\text{Similarity}(R1, R2)$ and it is related to their distance, which can be marked as $\text{Distance}(R1, R2)$. According to the DH theory, the Similarity (R1, R2) should always be presented as a percentage that fits the range from 0% to 100%. All Distances should be normalized to numbers that appear on the range from zero to one, so that zero distance means full similarity and the distance of one means no similarity.

In the simplest case, R1 and R2 have only one single attribute. In this case, they have to be first measured along this attribute-dimension and the result needs to be presented as a number between zero and one. In order to reach this goal, different methods need to be used depending on the scale that has been used for each dimension.

Ordinal scale: If an *ordinal scale* is used, the scale should be formed into an adjective scale following

the ideas of the Likert scale. If the attribute can be stated as *adjective A*, then the scale could be “Not at all A”, “Slightly A”, “Rather A”, “Very A”, or “Extremely A”. After the adjective scale has been formed, each class should be given a Value based on the following equation, in which Order is the integer position of the ordinal class in the list of all ordinal classes:

$$\text{Value} = \frac{\text{Order} - 1}{\text{Amount of classes} - 1}$$

If the adjective scale that has five classes, as is the case of the most common Likert scale, the value of the third class (“Rather A”) would be 0.5 and the value of the fourth class would be 0.75. Once the Values have been set, the Distance between two classes can be calculated with the following equation, in which Dim is the attribute-dimension that is used for measurement.

$$\text{Distance} = \frac{|\text{Value}(R1)_{\text{Dim}} - \text{Value}(R2)_{\text{Dim}}|}{\text{AmountOfClasses}}$$

Based on this equation, the Distance between “Rather A” and “Very A” would be 0.25. This figure is relatively important in the DH theory, as all Distances that are smaller or equal to 0.25 are considered small. Therefore, if there is a need to create Variation Rules that cause a small change, then one category of these rules is to “Move one step along an adjective scale”, and the length of this step would be considered small.

Numeric scale: If a scale with numeric values is used, it should usually be converted into an interval scale that contains less than a dozen of classes, and in which the lowest and highest class are left open so that they contain all values that would fit outside the normal length of the class. However, if the measured attribute is felt and perceived with an ordinal scale, then the measurement should be done on an adjective scale, in the same fashion, as is the case with the numeric and interval scales. In any case, the Distances between two classes along this attribute-dimension can be calculated with the equation given above.

Binary scale: If the scale is binary, the Distance is zero if R1 and R2 belong to the same class; if they belong to different classes, the Distance is one. Based on this, the distance between two classes on the binary scale is never small.

Nominal scale: If the scale is nominal, the Distance between two different nominal classes is one, unless the classes can be presented in a *typological tree*, in which the potential nominal values appear at least at three different levels of hierarchy. If this condition is met, then the Distance of two nominal classes can be calculated as the total *Length* of the node-steps that are required for reaching from one nominal class to the other, divided by the maximum *Length* of node-steps that separate the two most distant nodes of the tree. Every time a step is taken upwards in this hierarchy, the *Length* of the step is one, and when a step is taken downwards, its *Length* is equal to the amount of its children on the immediately lower level, minus one. For example, if there are only two children, then the *Length* of a downward step is one, and if there are ten children, the *Length* of the step is nine.

The Similarity of two nominal classes depends on the structure of the typological tree and on the area of the typological tree at which the observer focuses. In order to reduce the subjectivity in the creation of the typological trees it is recommended to create the trees with AI algorithms (see [Jiang et al. 2020](#)). After such a tree is created, it may also be possible to convert an attribute that is classified with a nominal scale into a set of attributes that can be measured on an ordinal scale.

Measuring the total distance based on many attribute-dimensions

Once the compared replicators R1 and R2 have been measured on two or more attribute-dimensions, their total arithmetic distance can be calculated with the *Euclidian* method, *Manhattan Taxi* method, or the *Minkowski* method. Theoretically, the Euclidian method would be the most accurate measure of Distance. However, if human observers have

decided to use attribute-dimensions 1 – n for characterizing the replicators R1 and R2, it is likely that it is typical for humans also to measure similarities and differences along dimensions 1 – n, instead of going into the complicated mathematical calculations of the Euclidian method. Therefore, the best simulation of human behavior would probably be to use the Manhattan Taxi method for calculating similarities. In addition, the Euclidian method of calculating Distance (and Similarity) is not ideal for situations in which many attribute-dimensions are binary or nominal, and the significance of the attribute-dimensions varies. In these cases, the Euclidian method will require relatively complicated mathematical calculations without securing the validity of the results. Due to these reasons, DH theory recommends the use of the Manhattan taxi method, giving carefully selected weights to the attribute-dimensions. In the *Manhattan Taxi* method, the Distance between R1 and R2 is calculated with the following equation.

$$\text{Distance}(R1, R2) = \frac{\sum_{Dim=1}^n |Value(R1)_{Dim} - Value(R2)_{Dim}| * Weight_{Dim}}{\sum_{Dim=1}^k Weight_{Dim}}$$

In this equation, n is the amount of attribute-dimensions, along which the replicators R1 and R2 are measured.

Conversion of Distances to Similarities

According to the DH theory, the distances between R1 and R2 along all attribute-dimensions are normalized into numbers that appear at the range from zero to one. Therefore, also the weighted average of these distances is at the same range. Based on this, the Distance (R1, R2) can be converted into a meaningful Similarity percentage with the following equation, in which *MaxDistance* is the maximum distance that can be measured within a replicator set, which contains R1, R2, and a relatively large group of benchmark replicators.

$$\text{Similarity}(R1, R2) = \left(1 - \frac{\text{Distance}(R1, R2)}{\text{MaxDistance}}\right) * 100\%$$

In this equation, Distance (R1, R2) is calculated with the Manhattan Taxi method as described above. The MaxDistance can be calculated with the

$$MaxDistance = \frac{MaxDistEmp * n + MaxDistTheor}{n + 1}$$

In this equation, MaxDistEmp is the maximum distance that can be observed within the replicator set, and MaxDistTheor is the theoretical maximum distance within the space that is induced by the attribute dimensions. The value of MaxDistTheor is calculated as $\sum_{Dim=1}^k Weight_{Dim}$. The weights of these two terms are set in such a fashion that the weight for MaxDistTheor is one and the weight for MaxDistEmp is $n+1$ in which n is the size of the replicator set that includes R1, R2, and some potential benchmark replicators that are relatively similar to R1 and R2. Based on these equations, MaxDistance is always bigger than Distance (R1, R2), which means that Similarity will always be a percentage that is on the range from 0% to 100 %. This means that the resulting Similarity figures can be used for comparing the similarity of *two stone axes* to the similarity of *two potential cognates* or to the similarity of *two variants of a folktale*.

Similarities within a large group of non-structured replicators

The simplest case of a replicator is a meme, which *does not have a structure*, and which appears as a relatively large group of variants M_1-M_n in the same field of study. Although the large size of this group may add more work into the calculation of similarities between the memes of the studied group, the large size will make the MaxDistance statistically more meaningful, increasing the validity of the Similarity (M_1, M_n) figures. The first step in the calculation of these figures is to select the attribute-dimensions that describe the meme, and classify memes into classes along these dimensions. After this, the Value [M, Dim] can be calculated for all the memes ($M=1$ to n) along all dimensions ($Dim = 1$ to m). The next step is to set the Weights to the dimensions and to calculate the weighted Manhattan Taxi distances from all the memes M_1-M_n to all other memes. Once these distances have been

following equation that calculates the weighted average of MaxDistEmp and MaxDistTheor.

calculated, the maximum distance between these memes (MaxDistEmp) will also be known. In addition, it will be easy to calculate the maximum theoretical distance between two memes in this space by the equation of MaxDistTheor (see above). Based on these calculations, it is possible to calculate mechanistically the Similarities between all the memes of the studied set of memes. In addition, it may be possible to identify groups of memes that have a Similarity higher or equal to 89%. Based on this high level of similarity, these groups can be identified as *stereo-concepts* (see p. 23). This means that they can be replaced relatively easily with each other intentionally or unintentionally.

Let us take the spoken sounds that the human mouth can produce as an example. Then let us limit these sounds to all sounds that have been used in at least one of the spoken human languages (excluding sign languages and languages that use whistling as a means of communication). The resulting set of spoken sounds has been classified according to the International Phonetic Alphabet into phones. Each phone can be measured by a set of 9 attribute-dimensions, if it is a vowel, and along 15 attribute-dimensions, if it is a consonant. Based on these dimensions, it is possible to assign numeric values to the IPA phones along these dimensions, and it is possible to normalize these values so that they will all be within the range from zero to one. This task has been completed by Vakulenko (2022). In order to simplify the comparison of phones to each other, it is possible to focus on the *Latin Phones*, which are defined in the DH theory as those *IPA phones that can be presented with Latin letters without diacritics*. In linguistics, the spoken phones are surrounded with slashes, so that it is easier to distinguish the spoken sound /s/ from the written letter “s”. After all the numeric values of the IPA phones along the attribute dimensions are known, as

well as the weights of attribute-dimensions, it is possible to calculate the Similarities between selected phones by using the method described in on pages 47–48. Based on these calculations, the following *Latin phones* on rows 1–7 were identified as *Close Peers*, except for /a/ and /ä/, which are almost identical. Based on this, the concepts on rows 1–7 can be considered as instances of the same *stereo-concept*.

Table 5: Similar phones as stereo-concepts

#	Label of the stereo-concept	P1	P2	P3	P4	Similarity within group
1	A-E-I-Ä	/a/	/e/	/i/	/ä/	91–98%
2	O-Y-U	/o/	/y/	/u/		94–98%
3	C-K-Q	/c/	/k/	/q/	/t/	93–96%
4	G-K	/g/	/k/			89%
5	T-D	/t/	/d/	/c/		89%
6	B-P	/p/	/b/			89%
7	F-V	/v/	/f/			89%

The full summary of the similarities between all *Latin phones* has been presented in Table 18 (p. 84).

Measuring the similarity of two memeplexes that have the same structure

Another relatively easy case for measuring similarity is the comparison of two memeplexes M1 and M2 that have the same structure, which means

that they have the same amount of lower level parts (e.g. memes) and these parts are at the same order. In addition, it can be assumed that the lower level parts are similar enough so that they can be considered instances of the same lower level part. Let us take as an example the comparison of symbols $\mathcal{M}$ and $\mathcal{W}$. It is possible to use one attribute-dimension for measuring, whether the symbol $\mathcal{M}$ appears in its normal posture $\mathcal{M}$ or in its flipped posture $\mathcal{W}$. In addition, it is possible to identify four line elements Line₁, Line₂, Line₃, and Line₄, and define the related *Contains*(Line, Pos) attributes in which *Line* is the contained element (in this case a constant) and *Pos* is position 1–4. Based on these five attribute-dimensions, the Similarity of $\mathcal{M}$ and $\mathcal{W}$ can be calculated based on their weighted Manhattan Taxi Distance along all the formed attribute-dimensions. This calculation can be made with the help of a *Feature Comparison Table*, as is shown in Table 6 below. The rows 1–5 are attributes, and the columns 1 and 2 represent the compared replicators $\mathcal{M}$ and $\mathcal{W}$. The columns 4–5 contain numeric values that are needed for calculating Distances, and the bottom of the table shows the calculations of Similarity at the summary level. All *Contains* (Line, Pos) attributes of the table were given the weight of one, and the posture attribute was given the weight of one. The size of the compared replicator set *n* was only 2, which reduced the Similarity of $\mathcal{M}$ and $\mathcal{W}$ (see p. 47).

Table 6: Calculation of the Holistic Similarity of two similar symbols using a Feature Comparison Table

0	1	2	3	4	5	6
#	Attribute description	M1 = $\mathcal{M}$	M2 = $\mathcal{W}$	Distance	Weight	Distance times Weight
1	Contains (Line, Pos ₁)	Yes	Yes	0	1	0
2	Contains (Line, Pos ₂)	Yes	Yes	0	1	0
3	Contains (Line, Pos ₃)	Yes	Yes	0	1	0
4	Contains (Line, Pos ₄)	Yes	Yes	0	1	0
5	General position of R	Upright	Flipped	1	1	1
MaxDistEmp = Distance(R1, R2) = Sum of (Distance*Weight)				= 1		
Maximum Distance = (MaxDistEmp * n + MaxDistAbs) / (n+1) = (1+5)/(2+1)				= 2		
Similarity = 1 – Distance(R1,R2) / Maximum Distance = 1 – 1/2				= 50 %		

Although these principles for measuring the dimensional Similarity (R1, R2) are transparent, reproducible, and automatable, the results depend on the amount of benchmark replicators, as this amount has a heavy effect on the MaxDistance. In addition, it is possible that we wish to pay attention to the differences between the lower level parts of a

memex. For example, in the case of $\mathcal{M}$ and $\mathcal{W}$ it is possible to see that $\mathcal{M}$ contains only straight lines, whereas the two central lines of $\mathcal{W}$ are curved. These differences can be taken into account by adding to the Feature Comparison Table some additional attributes that measure, how similar the compared memplexes are to each other.

Table 7: Comparing the features of two symbols in which the parts are slightly different

#	Attribute description	M1 = $\mathcal{M}$	M2 = $\mathcal{W}$	Distance	Weight	Distance times Weight
1	Contains (Line, Pos ₁)	Yes	Yes	0	1	0
2	Contains (Line, Pos ₂)	Yes	Yes	0	1	0
3	Contains (Line, Pos ₃)	Yes	Yes	0	1	0
4	Contains (Line, Pos ₄)	Yes	Yes	0	1	0
5	Shape (Line, Pos ₁)	Not curvy	Not curvy	0	0.5	0
6	Shape (Line, Pos ₂)	Not curvy	Rather curvy	0.5	0.5	0.25
7	Shape (Line, Pos ₃)	Not curvy	Rather curvy	0.5	0.5	0.25
8	Shape (Line, Pos ₄)	Not curvy	Slightly curvy	0.25	0.5	0.125
9	General position of R	Upright	Flipped	1	1	1
MaxDistEmp = Distance (R1, R2) = Sum of (Distance times Weight) = 1.625						
Maximum Distance = (MaxDistEmp * n + MaxDistAbs) / (n+1) = (1.625*2+7)/(2+1) = 3.42						
Similarity = 1 – Distance (R1,R2) / Maximum Distance = 1 – 1.625/3.42 = 48 %						

Comparing two strings of elements that share a similar sequence

This chapter presents a method for comparing to each other all strings of elements, in which the elements may be, for example, symbols, letters, signs, genes, pearls, choreographic movements, or detailed steps in a ritual, custom, or fabrication methods. The string can be perceived as a memplex, and the elements can be perceived as the memes of the memplex. The example that is used to illustrate this method is the comparison of two

spoken words. In this comparison, a *spoken word* is defined as a string of phonemes that is separated from other words by a pause. This definition ignores the meanings of words in order to be applicable also to unknown languages that an intelligent learner does not yet understand, and to all utterings that have the potential to be developed into words within a group of intelligent speakers.

The first step in the comparison of strings is to identify the most similar sequence that the compared strings S1 and S2 contain. In this sequence identification, elements that are at least

85% similar to each other count as similar. In the case of spoken words, similar elements (phones) have been listed in Table 5 (p. 49). If the strings do not contain a shared sequence that would have the length that is at least 25% of the length of the longer of the strings, the Similarity(S1, S2) can be concluded as zero. Based on these criteria, the *spoken words* /agadir/ and /oka/ have a similarity that is greater than zero, whereas the words /g/ and /gadir/ have zero similarity.

After the maximally long shared sequence is discovered, S1 and S2 are aligned so that the shared sequences are matched with each other and the non-

matching parts are handled as the *prefix* part and as the *postfix* part. After these preparations, the compared strings S1 and S2 can be presented in a Feature Comparison Table as columns, and the attribute rows would start from the prefix elements of that string which has the longest prefix. If at least one of the phones is not empty, the weight should be set to one if both compared phones are vowels and to two if they are not. Only those phone-pairs in which at least one member of the pair is not empty should be compared. Table 8 below shows an example of a Feature Comparison Table that is used for comparing the word /gadir/ to three similar words.

Table 8: Comparison of the word /gadir/ to three similar spoken words based on a shared sequence

	1	2	3	4	5	6	7	8	9
#	Attributes	S1 /gadir/	S2 /kadir/	S3 /agadir/	S4 /pgadir/	Weight	Similarity (%) * Weight		
							/gadir/ vs /kadir/	/gadir/ vs /kadir/	/gadir/ vs /pgadir/
0	Phone in p – 1	-	-	-	/p/	2			0
1	Phone in p 1	/g/	/k/	/k/	/g/	2	178	178	200
2	Phone in p 2	/a/	/a/	/a/	/a/	1	100	100	100
3	Phone in p 3	/d/	/d/	/d/	/d/	2	200	200	200
4	Phone in p 4	/i/	/i/	/i/	/i/	1	100	100	100
5	Phone in p 5	/r/	/r/	/r/	/r/	2	200	200	200
6	Phone in p 6	-	-	/a/	-	1		0	
Weighted sum of the Similarities							778	778	800
Sum of Weights							8	9	9
Similarity(S1,Sn) = Weighted sum of Similarities / Sum of Weights							97%	86%	88%

Once the weighted similarities of the element-pairs have been calculated into column 7–9 based on Table 5, the Similarity (S1, Sn) can be calculated as the weighted average of the Similarity figures of the columns 7–9. Strings, however, cannot be compared based on these attribute rows only. It is necessary to

add also holistic attributes that describe the compared strings. For example, it is possible to define a group of *Contains (SE)* attributes, which tell whether the strings contain the stereo-element, which can be any of the stereo-elements that appear in any of the compared strings. Based on this, the

Feature Comparison Table of the previous example needs to be extended with these Contains (SE) attribute rows. Table 9 shows how the inclusion of

these Contains (SE) attributes will highlight the difference between /gadir/ and /pgadir/.

Table 9: Comparison of four similar spoken names with an extended Feature Comparison Table

#	Attributes	S1 /gadir/	S2 /kadir/	S3 /agadir/	S4 /pgadir/	Weight	Similarity * Weight		
							/gadir/ vs /kadir/	/gadir/ vs /agadir/	/gadir/ vs /pgadir/
0	Phone in p – 1	-	-	-	p	2			0
1	Phone in p 1	g	k	k	g	2	178	178	200
2	Phone in p 2	a	a	a	a	1	100	100	100
3	Phone in p 3	d	d	d	d	2	200	200	200
4	Phone in p 4	i	i	i	i	1	100	100	100
5	Phone in p 5	r	r	r	r	2	200	200	200
6	Phone in p 6	-	-	a	-	1		0	
6	Contains(GK)	Yes	Yes	Yes	Yes	2			
7	Contains(AEIÄ)	Yes	Yes	Yes	Yes	2			
8	Contains(TD)	Yes	Yes	Yes	Yes	2			
9	Contains(R)	Yes	Yes	Yes	Yes	2			
10	Contains(PB)	No	No	No	Yes	2	200	200	0
11	Ease of pronunciation	Very easy	Very easy	Very easy	Not at all easy	2	200	200	0
Weighted sum of the Similarities							1178	1178	800
Sum of Weights							12	13	12
Similarity(R1,R2) = Weighted sum of Similarities / Sum of Weights							98%	91%	67%

Factor-based similarity

In some cases, the similarities of replicators are measured based on two independent factors. Two words, for example, can be compared based on their *form* and based on their *meaning*, and two *artefacts* can be compared based on their *form* and *function*.⁶² In these cases, it is possible to calculate the Similarity (R1, R2) separately for each factor, and then calculate the Similarity (R1, R2) by multiplying these similarities with each other, or by calculating the average of these similarities. For example, let us assume that there are two words, for

which the similarity of form is 80% and the similarity of meaning is 10%. In this case, the multiplication method would yield the similarity of 8% whereas the average method would yield the similarity of 45%. According to the DH theory, people emphasize differences when they evaluate similarities based on several independent factors. Therefore, it is better to use the multiplication method, which effectively reduces similarity when at least one factor gets a low Similarity (R1, R2) value. Therefore, the general equation for the similarity of two cultural replicators is the following.

⁶² This principle was developed by Oscar Montelius (1885) in his book “Die Typologie der Montelius-Zeit; referenced by Lavento (2023)

$$\text{Similarity}(R1, R2) = \text{Similarity}(R1_{form}, R2_{form}) * \text{Similarity}(R1_{functionality}, R2_{functionality})$$

The similarity of the form (*form*) of R1 and R2 can be calculated with the methods presented in the previous chapters. The similarity of form can be calculated based on the methods presented in this chapter, or with some similar method. If a replicator appears in the material form, then the alternative materials can be treated as attribute-dimensions that constitute to the form. The functionality of a replicator combines functionality and meaning by assuming that the meanings of words, symbols, objects, and archaeological features are socially constructed based on their usage, which also defines their function.⁶³ The function of a replicator can be compared to the function of another replicator either by measuring it with various attribute-dimensions or by treating the functions as nominal classes that can be compared to each other with a typological tree (see p. 47).

Similarity of two meme sets

Meme sets are sets of memes that do not actively interact with the other memes of the same meme set, or the interaction exists but it is ignored (see p. 16). This means that meme sets do not have a structure in the same sense that memplexes do. Examples of meme sets include name sets, lexicons, lists of discovered artefacts, and sets of symbols that have been found in ancient pottery. The similarity of the meme sets MS_1 and MS_n can be calculated by organizing their memes into subsets that contain similar memes. The threshold of Similarity for forming these subsets can be set, for example, to 50–85%. Once the subsets have been formed, they can be treated as *stereo-concepts* (see p. 23). This means that the meme sets can be compared to each other with a *Meme Set Comparison Table*. All identified stereo-concepts are represented by a row, and then

those memes that do not fit to these stereo-concepts are each given an additional row in the *Meme Set Comparison Table*.

Let us take as an example the comparison of four ancient symbol systems, using Winters (1985) as a starting points. The symbol systems that Winters compared were the following:

1. Indus Script (3500–1900 BCE),
2. Indian megalithic pottery symbols (after 1900 BCE),
3. Egyptian Pottery signs (3100–2900 BCE),
4. West African Manding Script (after 3000 BCE)

Winters organized his findings to the form of four columns that contained symbols, and most of the rows of his table contained somewhat similar symbols. The problem of his comparison table is that it does not contain the meanings of each symbol and therefore it is difficult to see why symbols like # and ○ have been presented on the same row although they seem very different. If such knowledge of the meanings of these symbols does not exist, then all symbols that have a low level of similarity should be presented on separate rows. In addition, some cells of the Manding Script column contained two symbols that were not similar to each other. This is not justifiable, unless it is known that the symbols have the same meaning. If that is not the case, each cell should contain only one symbol. After removing these problems, the symbols system comparison table of Winters can be converted to the Meme Set Comparison Table that is shown in Table 10 (p. 54). The similarities on each row were calculated based on the Variation Rule based method, which is described in chapter 2.3. When parts were added or removed, all parts were assumed equally significant.

⁶³ The definition of the meaning of a word as the function of that word falls within the paradigm of usage-based linguistics.

Table 10: Comparison of four prehistoric symbol systems by the use of a Meme Set Comparison Table

#	Compared symbol systems				Similarity percentages					
	Mega-lithic Indian pottery symbols	Indus Script	Egyptian pottery symbols of the 1 st Dynasty	Manding Script	Megal. Indian vs. Indus Script	Megal. Indian vs. Egyptian	Megal. Indian vs. Manding	Indus Script vs. Egyptian	Indus Script vs. Manding	Egyptian vs. Manding
1	^	^	✓	^	100	80	100	80	100	80
2	⋈	⋈		⋈⋈	70	0	100	0	100	0
3	∧	Y	Y	∧	75	80	100	75	75	80
4	⋈	Y	Y	⋈	50	50	40	60	50	90
5	↑	↓	↓	↓	70	70	70	100	100	100
6	M	W		M	80	0	100	0	80	0
7	X	X		X	100	0	100	0	100	0
8			♀	♀	0	0	0	0	0	100
9	+	+		+	100	0	100	0	100	0
10	#				0	0	0	0	0	0
11		0	0	0	0	0	0	100	100	100
12	⋈			⋈	0	0	100	0	0	0
13		E	Ǝ	E	0	0	0	60	100	60
14	≠		≠	≠	0	80	80	0	0	100
15		b		b	0	0	0	0	90	0
16	フ	Σ	Z	フ	60	80	95	80	55	75
17	✱			✱	0	0	100	0	0	0
18		δ		δ	0	0	0	0	100	0
19	U	U	U	U	100	100	100	100	100	100
20	⌞	4		4	40	0	40	0	100	0
21	∪	∪	∪	∪	80	100	100	80	80	100
22	⌞	⌞	⌞	⌞	100	98	100	98	100	90
23	/	∩	/	/	85	100	100	85	85	100
24	⋈				0	0	0	0	0	0
25		⊠			0	0	0	0	0	0
26	∧			∧	0	0	100	0	0	0
27		◇		◇	0	0	0	0	100	0
28		◻	◻	◻	0	0	0	100	100	100
Similarity = Average of the Similarity percentages 1-28					40	30	58	36	65	46

The results of this comparison indicate a strong connection between West Africa and India. The connection is stronger for the Manding Script and Indus Script than for the Manding Script and the Indian Megalith pottery symbols. This suggests that the connection would have occurred more likely during the era of Indus Script (3300–1300 BCE) than during the era of the Indian megalith pottery symbols (1800–500 BCE).

Another example of the comparison of meme sets to each other comes from the field of folklore and art. In this area, the traditional terms such as a *theme*, *motif* and *narrative element* can be translated into the language of the DH theory, in which the concept of **micro-motif** is used for referring to those motifs and narrative elements that characterize a *being* in simple ways. These ways can include adjective or relational descriptions, or simple descriptions of events that happened to the *focal being*, which is called the **protagonist** in the DH theory. The protagonist may be mentioned in several different traditions or texts, which can be marked as T_1 – T_n , and it may be completely uncertain whether the stories refer to the studied protagonist or not. Sometimes the **micro-motif sets** that different sources provide are very similar but the name of the protagonist is different. Sometimes the names of the protagonist are the same, but the characterizations are different.

The micro-motifs that characterize the protagonist form a fuzzy set, as some micro-motifs clearly characterize the protagonist whereas others have a more distant relation. An example of a close relation is the relation of the protagonist to his parents, sisters, spouses, and children, whereas the relation from him to the more distant relatives belongs to the micro-motif set to a weaker degree. In order to handle this fuzziness, it is practically necessary to delineate the studied meme set to those narrative microelements, which are less than three steps away from the protagonist. This distance can be modelled by forming a *conceptual network* that contains the protagonist and the related micro-motif (see p. 47). In addition, the delineation can be done intuitively.

Let us assume that our task is to compare to each other various ancient characterizations that mention *Atlas the Ancient Ruler*, who would have been ancient already from the point of view of the Ancient Greek civilization. These characterizations appear in the works of Sanchuniathon, Homer, Hesiod, Plato, and Diodorus Siculus. Sanchuniathon described Atlas as an *ancient prince* who was *thrown to a deep pit* by his *elder brother* [Praep. Evang. 1.10]. Homer described him as the *ancient ruler of an island at the navel of the sea*, and who *was extremely sagacious*, who *knew the depth of all seas*, and who *held the pillars that keep the earth and sky apart* [Hom. Od. 1.44]. Hesiod described him as a *stout-hearted Titan*, who had *three brothers*, and who was the *father of many daughters*, and who was *punished by Zeus* so that he would have to *uphold the heaven on his shoulders* [Hes. Th. 517]. Plato described him as the *ancient ruler of a mysterious island, son of Poseidon* [Plat. Criti. 114a], and as the *father of many sons*. Diodorus described him as the *human ruler of a coastal kingdom in Africa*, who was such a *good astronomer* that he was falsely interpreted as *carrying the sky on his shoulders*; in addition, he was called *Titan* after his mother *Titaea*, and he had *many daughters* [Libr. Hist. III.54.5]. In order to compare these characterizations to each other, they were broken to motif-rows in the way that is shown in Appendix table 1. Based on these attribute rows it was then possible to create a Feature Comparison Table as is shown in Table 11 below. In this table, the adjective attributes that were not mentioned in some sources were considered as something “not worth mentioning” so that they could be given value 0.5 when comparisons were made. However, if an element that was not an adjective or quantitative was missing, then it was treated as a Contains (E) attribute that could only have values zero or one. The row #5 was given double weight, as it was the aggregated result of rows #5, #10, and #11 of Appendix table 1. Based on this table, it seems that Plato’s characterization of Atlas has its highest similarity with Diodorus and Homer, while being only remotely connected to Hesiod and Sanchuniathon.

Table 11: Comparison of different Atlas the Ancient Ruler motif sets by using an Attribute Table

#	Attributes of Atlas	Sanchu-niathon	Homer	Hesiod	Plato	Diodorus Siculus	Plato vs. Sanch.	Plato vs. Homer	Plato vs. Hesiod	Plato vs. Diod.
1	Is ancient	Very (0.75)	Very (0.75)	Very (0.75)	Ex-tremely	Very (0.75)	75	75	75	75
2	Royal status	Prince (0.5)	Ruler (0.75)	Ruler (0.75)	King (1)	King (1)	50	75	75	100
3	Maritime	(0.5)	Extremely (1)	(0.5)	Ex-tremely (1)	Rather (0.5)	50	100	50	50
4	Sagacious	(0.5)	Extremely	(0.5)	(0.5)	Extremely (1)	100	50	100	50
5	Superhuman	Not at all (0)	Rather (0.5)	Completely (1)	Slightly (0.25)	Not at all (0)	75	75	25	75
6	Oldest of brothers	Not (0)	(0)	Not (0)	Yes (1)	Yes (1)	0	0	0	100
7	Received a punishment	Yes (1)	(0)	Yes (1)	(0)	(0)	0	100	0	100
8	Amount of sons	(0.5)	(0.5)	(0.5)	Many (0.75)	Many (0.75)	75	75	100	100
9	Amount of daughters	(0.5)	Few (0.25)	Extremely many (1)	(0.5)	Extremely many (1)	100	75	50	50
10	Connection to the sky	(0.5)	Strong (0.75)	Extremely strong (1)	(0.5)	Extremely strong (1)	100	75	50	50
Weighted sum of the Similarities							700	775	550	825
Sum of the Weights							10	10	10	10
Similarity = Average of the attribute specific Similarity percentages							70%	78%	55%	83%

Intuitive measurement of similarity

According to the DH theory, humans and animals are unlikely to use arithmetic equations for calculating similarities. Instead, it they are likely to have developed a *sense of similarity* in order to distinguish edible food from inedible and poisonous foods, and for distinguishing one's own offspring from other specimen or for distinguishing friends from enemies.⁶⁴ This is because such a sense of similarity would increase their longevity and the longevity of their offspring. In addition, it would probably also reduce the mating of different species with each other. Although this sense of similarity is not directly producing similarity measures in percentages, it can distinguish which replicator pairs

have a higher similarity than some other replicator pairs. Based on this, it is possible to form arithmetic models of similarity and then calibrate these models based on laboratory experiments with test subjects. Once there is a sufficiently large set of Similarity figure benchmarks (measured arithmetically and calibrated in laboratory tests), these figures can be translated to verbal descriptions of similarity based on the responses of test subjects. Such a list of benchmarks and verbal descriptions of similarity have been provided in Table 12 below, based on one test subject (the author of this book), and based on an insufficient calibration of the models. Yet, it acts as the starting point of better calibrations, better Similarity percentages, and better verbal characterizations of similarity.

⁶⁴ According to Rainio (2023, 2), the old division of senses to vision, hearing, smelling, tasting, and touching is outdated,

and it is possible to distinguish dozens of senses that are typical to humans or to some other animal species.

Table 12: List of calculated Similarity figures and matching verbal descriptions of similarity

#	R1	R2	Similarity (%)	Verbal description of similarity
1	/a/	/ä/	98	Very high similarity (96 – 99%) → Almost Identical
2	/gadir/	/kadir/	98	
3	/c/	/k/	96	
4	/a/	/e/	95	High similarity (88 – 95%) → Close Peers
5	/a/	/i/	93	
6	/gadir/	/agadir/	91	
7	/b/	/p/	89	
8			88	Rather similar (61-87%) → Distant Peers
9	/i/	/o/	87	
10	/b/	/v/	86	
11	Plato's characterization of Atlas	Diodorus's characterization of Atlas	83	
12			80	
13	/o/	/i/	78	
14	Plato's characterization of Atlas	Homer's characterization of Atlas	78	
15	/a/	/o/	73	
16	/q/	/s/	73	
17			70	
18	Plato's characterization of Atlas	Sanchuniathon's characterization of Atlas	70	
19	/gadir/	/pgadir/	67	
20	Indus Script	Manding script	66	
21	/i/	/j/	64	
22			61	Low level of similarity (50–60%) →
23	/g/	/p/	60	
24	Megalithic Indian Pottery symbols	Manding script	59	
25	Plato's characterization of Atlas	Hesiod's characterization of Atlas	55	
26	/n/	/q/	53	
27	/o/	/j/	51	
28			50	
29			49	Very low level of similarity 7 – 51%
30	Egyptian pottery symbols (1 st dyn.)	Manding script	46	
31	Megalithic Indian Pottery symbols	Indus Script	40	
32	Megalithic Indian Pottery symbols	Egyptian pottery symbols (1 st dynasty)	32	
33	Indus Script	Egyptian pottery symbols (1 st dynasty)	37	
	Lexicon of the Basque language	Lexicon of the Southern Berber language	7 - 11	

Peers: The table above defines two replicators as Peers, if their Similarity is over 60%. The Similarity of two replicators that have a similar form and a meaning can be calculated by multiplying the Similarity of form by the Similarity of meaning (see p. 52). If there is a need to improve the table above, the first step is to check whether the order of the Similarity percentages is intuitively correct and whether the verbal descriptions sound feasible. Because of this check, it may be possible to conclude that the similarity of symbols  and  seems too low. This may act as a reason to review the calculation equation and related parameters

(p. 49). Once the order of the similarities is known, the similarity percentages can be connected to verbal descriptions of Similarity.

Although the methods that were presented in this chapter can be used to model the outcome of human similarity evaluations, they do not provide a good model for the *process* of similarity evaluations that is used by humans, because humans do not calculate weighted averages arithmetically in their mind. Due to this, it may be better to measure the distances and similarities of replicators with Variation Steps. This approach is described in the next chapter.

2.3 Variation Rules for predicting and measuring cultural evolution

Replicators can change via holistic processes, which change their descriptive characteristics along some attribute-dimensions, and via partial processes, which add, remove, or change their parts. According to the DH theory, small changes to replicators on each level of hierarchy are more likely than big changes. Therefore, it is better to focus on small changes, if we wish to predict how replicators change over time. According to the DH theory, one possible method for modelling small changes is the *Variation Rule Based Method*. This method is ideal for generating variants of existing replicators, for example, while constructing Ethnic Sets (see p. 61). Another use of the method could be the forecasting of cultural evolution because the cumulative effects of small changes, modelled by Variation Rules, are likelier than sudden big changes (see p. 58). A third application area of Variation Rules is the calculation of the *Similarity* of two replicators R1 and R2. The potential advantage of this method compared to the arithmetic methods is that it is easier for humans to apply, and therefore it may be a better model of the

actual process that humans use when they make unintended mutations or when they intuitively evaluate the similarity of two things.

Variation Rules and the probability of mutation and correction

According to the DH theory, each Variation Rule is presented with a Variation Step Length, which measures the decline of Similarity when replicator R1 is converted to replicator R2 by the application of the rule. The Variation Step Length can be calculated by the following equation:

$$\text{Variation Step Length} = \frac{100\% - \text{Similarity}(R1, R2)}{10\%}$$

Based on this equation, it is possible to construct the following conversion table that can be used for converting Similarities to Variation Step Lengths, or Variation Step Lengths to Similarity percentages and to verbal descriptions. From the point of view of cultural evolution, the upper right hand corner is the most significant as the probability of mutation is high and the probability of social auto-correction is low.

Table 13: Matching Variation Step Length with the reduction of Similarity Percent

Similarity of R2	Variation Step Length	Verbal description	Probability of mutation of this magnitude	Probability of social auto-correction
100%	0	Identical copy	Somewhat low	Extremely low
to 99 %	0.1	Change to extremely similar	High	Low
to 98 %	0.2	Change to very high similarity	High	Rather low
to 86 – 97 %	0.3 – 1.4	Change to high similarity	High	Somewhat high
To 66– 85 %	1.5 – 3.4	Change to rather similar	High	High
to 50 - 65 %	3.5 – 5	Change to low similarity	Somewhat high	Very high
7 – 40 %	5.1 – 9.3	Change to very low similarity	Not so high	Extremely high
0 – 6 %	9.4 – 10	Change to something that is totally different	Relatively low	Lack of understanding (no correction proposed)

The following chapters list Variation Rules that produce a 1–14% reduction in similarity for a string

or for an opaque visual symbol, which no longer resembles some object or being. This means that this

level of mutation is simultaneously likely and yet small enough so that auto-correction does not root out the mutated versions so effectively. Therefore, such Variation Rules are likely to explain the vast majority of cultural evolution that occurs because of

shifting, meaning the cumulative effect of small changes to cultural replicators. These Variation Rules can be divided to *structural* and *holistic* rules as illustrated in Figure 5 below.

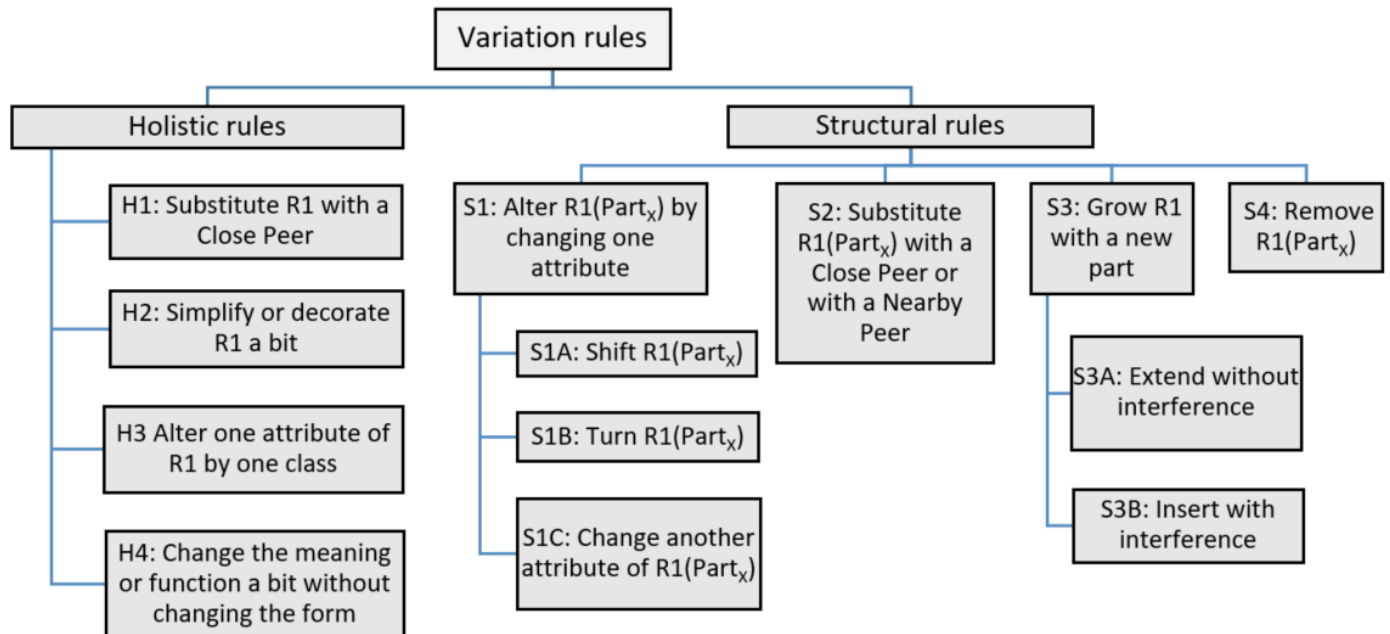


Figure 5: Different types of Variation Rules

The holistic rule H1 and the structural rule S2 are easy to use, if the amount of *Peers* is limited so that the Variation Step Length can be calculated upfront based on Manhattan Taxi distance and based on the equations shown in chapter 2.2. The Variation Step Length of holistic rules H2, H3, and H5 is approximately one, meaning that R2 would have a high level of Similarity with R1. The more precise matching of the expression “a bit” with corresponding Similarity (R1, R2) values and Variation Step Lengths would require empirical tests.

For the structural rules, it may be difficult to generate Variation Rules that would have constant Variation Step Lengths, as the amount of parts in R1 and R2 is likely to have an effect on the observed similarity of two replicators when one part is altered, substituted, removed, or added. Therefore, it is necessary to make some assumptions in order to

create general Variation Rules. According to the first assumption, the compared replicators have about 4–8 parts that can be identified by a human observer. According to the second assumption, human observers ignore the amount of parts in similarity estimates when the amount of parts is within this range. Therefore, the Variation Rules do not need to take into account the amount of parts or elements that exist before the Variation Rule was applied, and what was the amount after the rule was applied.

A list of Variation Rules of all types has been given in Table 14 below. The list has been created for changing a string of 4-8 elements (see p. 50) or for changing a non-representative or opaque symbol that consists of 4-8 parts. In the table, R1 means the replicator before the rule has been applied, and R2 is the replicator after the application of the rule:

Table 14: List of simple Variation Rules and related Variation Step Lengths

	Type	Rule	Variation step length (VSL)	Similarity(R1,R2)
1	H1	Substitute R1 with almost Identical replicator or with a Close Peer	$\frac{1 - \text{Similarity}(R1,R2)}{10\%}$	88–99 %
2	H2	Simplify or decorate R1 a bit	1	90%
3	H3	Alter one ordinal attribute of R1 by one class	0.25	97.5%
4	H3	Alter one ordinal attribute of R1 from one extreme to the other	1	90%
5	S1A	Shift R1(Part _x) without causing interference with other parts	0.5	95%
6	S1A	Shift R1(Part _x) causing minor interference with other parts	1	90%
7	S1B	Turn R1(Part _x) slightly	0.5	95%
8	S1B	Turn R1(Part _x) more than slightly	1	90%
9	S1C	Change some other attribute of R1(Part _x)	Varies	
10	S2	Substitute R1(Part _x) with an Almost Identical part	0	100%
		Substitute R1(Part _x) with a Close Peer	0.5	95%
11	S2	Substitute R1(Part _x) with a Nearby Peer	1	90%
12	S2	Substitute R1(Part _x) with a part that is not Close or Nearby Peer	2	80%
12	S3A	Extend R1 without interference by adding an insignificant part	0.5	95%
13	S3A	Extend R1 without interference by adding a significant part	1	90%
14	S3A	Extend R1 without interference by adding several parts	2	80%
15	S3B	Insert into R1 a relatively insignificant part (causing interference)	2	80%
16	S3B	Insert into R1 a relatively significant part (causing interference)	4	60%
17	S4	Remove one part	Length to be calculated based on rules 12-16 (applied to R2)	90%

The table contains two important concepts, which are needed for interpreting the rules. The *interference* of a part with others means that a part overlaps another part, or is inside the structure of the replicator so that it touches at least two other parts. In the study of strings, interference means that an element is between two other elements. In the study of symbols, interference means that the part is inside the symbol or overlapping some other part excluding the cases in which it is inside another part. The significance of a part will depend on its *size*, on its *type*, and on its *effect on the other parts* that it

touches. In phonetics, for example, a phone with a long duration can be considered of bigger size than a short phone, making it more significant. In addition, the consonants tend to be more significant than vowels. The effect on other parts may be such that the added part changes an existing part without actually adding a part. In phonetics, for example, the adding of a vowel next to another vowel may convert the vowel into a diphthong, which means that an alteration of a phoneme occurred instead of an addition of a phone.

Once the Variation Rules have been formulated, their Variation Step Lengths should be tested in laboratory conditions in order to correct those Variation Step Lengths that were incorrectly estimated by the scholar who formulated them. In addition, the field of application will have its effect on what Variation Rules are applicable. For example, the *shift* and *turn* rules (#4–7) are applicable only for two-dimensional replicators such as drawn symbols and for three-dimensional replicators such as artefacts. Once all the Variation Step Lengths are known, it is possible to use the following equation for calculating the total **RouteLength** of the variation steps that are needed to close the gap between two existing replicators R1 and R2.

$$\text{RouteLength}(R1, R2) = \sum_{\text{Step}=1}^n \text{VariationStepLength}_{\text{Step}}$$

If the RouteLength (R1, R2) is different from RouteLength (R2, R1) then the shorter of these two RouteLengths should be chosen. The RouteLength (R1, R2) can be converted to Similarity (R1, R2) based on the following equation, which has been derived from the equation of page 58.

$$\text{Similarity}(R1, R2) = 100\% - 10\% * \text{RouteLength}$$

It can also be matched with verbal descriptions based on Table 13 (p. 58).

2.4 Ethnic Sets as subsets of cultures

According to the DH theory, an **Ethnic Set** is a set of those replicators that are characteristic to a Carrier, which may be a region, culture, or a population (see p. 11). The carried replicators can be genetic markers, ecofacts, artefact styles, industries, beliefs, values, rituals, customs, words, names, or stories. In most cases, it is practical to form the Ethnic Set in such a fashion that it contains only those replicators that belong to the same type. For example, an *Ethnic Name Set* is a set of names that are characteristic to a region culture or population, and an *Ethnic Word Set* is a set of words that are

typically used in the spoken language at some region, culture, or population. This means that Ethnic Sets are sectoral subsets of cultures. In the DH theory, the main purpose of Ethnic Sets is to analyze migration paths of replicators (see p. 62–69), and to identify the likely urheimats of the studied Ethnic Sets.

According to the DH theory, the Ethnic Sets may be intentionally biased in the way they are formed, focusing at a specific region, culture, or population. In addition, they may be unintentionally biased or misleading in their naming, as they may contain implicit hypotheses that do not match with empirical data. For example, the Name Set of *Ancient Iberian Names* is intentionally biased by focusing at the names that have been used in Ancient Iberia. However, the name of this Name Set contains the implicit and potentially fallacious assumption that these names would originate from Ancient Iberia. According to the DH theory, these implicit hypotheses should be converted into explicit hypotheses, and empirical research should be performed in a manner that may possibly falsify these implicit hypotheses. An example of such an explicit hypothesis is that *Ethnic Set ES1 appears more commonly and more densely in Carrier C1 than within the other carriers C2 – CN*.

Formulation of Ethnic Sets

Ethnic Sets appear in their *original*, *sampled*, and *extended* form. An *original ethnic set* contains replicators, which are common within the focal Carrier and which are assumed to appear more numerous and more densely within the studied Carrier than in within other Carriers. If the original ethnic set is too large, it can be sampled using a systematic or randomized sampling method, and producing the sampled ethnic set of the study (the sample). After confirming the sample, the Sampled Ethnic Set will contain a set of **Focal Replicators**, meaning the replicators at which the study is originally focused. The sample is then extended by including to it all replicators that are Close Peers of the Focal Replicators, and which appear in at least one Carrier of the study. This will create a set of **Replicator Families**, which consist of the Focal

Replicator and its empirically identified Close Peers. An example of a *Replicator Family* is the *Name Family*, which has been created by generating variants of the selected focal name, and then including to the Name Family those names that appear within at least one Carrier region or population (see chapter 3.6).

The Sampled Ethnic Set needs to be extended with this method because it is only an assumption that its replicators are more common within the focal Carrier than within other Carriers. By searching for the Close Peers of these replicators, it is possible to see that the Ethnic Set or some of its Replicator Families are actually more common in some other Carrier. If variants are not created, it will not be possible to identify all *potential cognates* (p. 67) and

urforms of the replicators of the studied Ethnic Set; this will lead to the conclusion that the urheimat of the replicators of the Ethnic Set is the assumed urheimat. For example, when studying the name set of Ancient West African names, there is a risk that variants are not considered, and therefore it is assumed that the Ancient West African names originated from West Africa (see p. 184).

Once the Ethnic Set has been defined in its Original, Sampled, or Extended form, it is possible to calculate its Appearance at different Regions of the study with the following equation in which n is the amount of Replicator Families within the Ethnic Set and m is the amount of variants within each Replicator Family:

$$Appearance(ES, Region) = \sum_{Family=1}^n \sum_{Variant=1}^m Appearance(Family_n, Variant_m, Region)$$

Once the Appearance figures have been calculated, it is possible to calculate additional figures that characterize the regions. *PopDensity* is equal to Appearance divided by the population of the Carrier, which may be an ethnic group or a geographical region. *GeoDensity* is equal to Appearance divided by the surface area of the Carrier region.

2.5 Calculating urheimats and migration paths with WUI and Weighted LCA

This chapter presents a couple of methods for calculating the urheimat of a replicator, but these methods should be applied only to relatively large or complex replicators, which are not caused by an attractor and which are not likely to emerge independently in parallel at several regions. The ideal case for such a replicator is an Ethnic Set, which consists of Meme Families, which have been formed of somewhat complex memes. This chapter describes first how to calculate and deduce the urheimat of an Ethnic Set, and then at the end discusses how the presented method can be used for analyzing the urheimats of Meme Families or complex replicators with some caution.

Deducing the urheimat of an Ethnic Set

According to the DH theory, Ethnic Sets are *sets of replicators, which characterize a specific Carrier and which intend to distinguish it from other Carriers* (see p. 61). In some cases, it is very easy to find replicators that characterize a Carrier, but it is yet difficult to identify replicators that would distinguish this Carrier from others. For example, the *Ethnic Recipe Set* of the Finnish food culture can be constructed as a list of foods that are popular in Finland. This would add to the list, for example, hamburgers, pizza, Pasta Bolognese, kebab, butter chicken, sushi, meatballs, cured salmon, Karelian pies, and reindeer stew. Yet, the elimination of all non-authentic Finnish foods would immediately remove from the list all other foods except for meatballs, cured salmon, Karelian pies, and reindeer stew, which however, have also been loaned from

other food cultures. In some cases, however, it is worthwhile to intend to construct Ethnic Sets that might contain something authentic that is not loaned. Languages, for example, may be perceived as *Ethnic Word Sets* that may contain words, which are authentic parts of that language or which were loaned from some other language so long time ago that it is no longer possible to identify the origin of the word. In a similar fashion, *Ethnic Name Sets* can contain names that have been characteristic for a specific region, population, or culture for a so long time that it is difficult to identify the other cultures from which the names would have been loaned. Yet, the DH theory offers three tools for identifying the urheimat(s) of an Ethnic Set. These tools are Weighted Urheimat Indicator (WUI), Weighted LCA, and archaeological deduction.

Archaeological deduction is based on the following principles for identifying the urheimat of a Meme Family such as a family of similar artefacts or constructions, or the urheimat of an Ethnic Set such an archaeological context (e.g. tombs), industries, or packages.

1. If the replicators of the studied Meme Family can be dated, then the likely urheimat is the location where the studied replicators were first discovered. The dating of material and etched replicators can be done by natural scientific methods⁶⁵ or by comparative methods such as stratigraphy, dating by coins, or seriation. The dating of performative replicators such as words, languages, stories, and rituals is more difficult.
2. If some replicators of the studied Ethnic Set can be dated, then these replicators can be used

$$WUI = \sum_{Indicator=1}^n = Weight_{Indicator} * \max(0, 2 - Rank)_{Indicator}$$

In other words, every time when the Carrier population, region, or culture ranks highest based on Indicators 1–n, it gets “indicator points” worth of the Weight of the Indicator. If two Carriers have the same Rank on an indicator, they share the indicator

for deducing the urheimat of the Ethnic Set with some caution. For example, if the Ethnic Set has been defined so that it contains genetic markers and cultural replicators, then the urheimat of this ethnic set could possibly be deduced by deducing the urheimat of the genetic markers that are included in the Ethnic Set. This method, however, is risky, as there is no deterministic connection between genetic markers and cultural replicators such as words, languages, and artefact styles.

3. If the replicators cannot be dated, then the region with the highest variation of the studied replicator is likely to be the urheimat, assuming that the variants are all sufficiently similar to the original focal replicator (so that they clearly belong to the same replicator family). This method can be used, for example, for deducing the urheimats artefact styles, haplogroups, and languages.

Weighted Urheimat Indicator is a tool for calculating the urheimat of an Ethnic Set, but it can be used also for calculating the urheimat of Replicator Families and other sufficiently complex replicators. Its advantage is its suitability to those cases, in which the replicators cannot be dated or have all been dated to the same period, but the results are not as reliable as the results obtained by the archaeological deduction principle 1 (see above). In this method, the urheimat of an Ethnic Set is the Carrier that receives the highest *Weighted Urheimat Indicator* (WUI) based on the following equation, in which *Rank* means the order of the Carrier in the “TOP 10” list of the Carriers, measured by Indicator.

points while calculating the sigma. The proposed indicators and their weights are given below:

- Appearance, weight 2
- GeoDensity, weight 1
- PopDensity, weight 1

⁶⁵ For example, based on radiocarbon method, palynology, dendrochronology, thermo-luminescence, optical luminescence, or uranium-thorium method

The calculation of these figures has been explained in chapter 2.4. Appearance is given the highest weight, as in the DH theory the regions of high appearance are considered sources of migration, and the regions of small appearance and high density figures are considered colonies or migrant populations, which intend to cherish the replicators of their ethnic origin in their new homeland.

An additional adjustment to *WUI* is the division of the replicators of the Ethnic Set to very simple, simple, and complex in such a fashion, that *simple* refers to those replicators for which chance resemblance is likely or very likely, whereas *complex* refers to those replicators that are unlikely to emerge independently in parallel in several regions. After this division, the complicated

replicators can be given more weight than the simple replicators, and the very simple replicators can be ignored from the calculation of *WUI* (see chapter 5.2). The usage of this method means that the urheimat of an Ethnic Set would be that region or population, which has the highest Appearance of the Ethnic Set, however, balancing the Appearance figures with *GeoDensity* and *PopDensity*.

Weighted LCA: In this method, the likely urheimat of a replicator is the Urheimat Candidate (UC), which minimizes the Travel Cost of the replicator based on the following equation, in which the Appearance of the replicator at each Region is used as a *weight*,⁶⁶ when calculating the travel costs from UC to the Region:

$$Travel\ Cost = \sum_{Region=1}^n Appearance(Region) * RouteLength(Region, UC, Era)$$

In this equation, *RouteLength (Region, UC, Era)* is calculated with LCA as the smallest cumulative travel cost between *Region* and *Urheimat*, and it is dependent on the *Era*. This means that Travel Cost and the Urheimat would have to be calculated separately for different eras. For example, during prehistoric times, paved roads and traveler's services would not have existed yet. This means that long distance travel by waterways would have been the fastest means of travel in most cases. Based on this assumption three alternative eras can be identified: 1) The era before rowing boats and canoes, 2) the era of seafaring without navigation, 3) the era of seafaring and navigation. While setting the limits between these eras, the term *navigation* includes all methods of navigation across open seas, including navigation based on the position of sun, stars, winds, waves, and birds (Dahlström 2023). The time limits for the eras may vary according to the studied population, culture, and region (see chapter 4.2).

In many cases, it will be possible to identify arbitrarily one or two urheimats that minimize

Travel Cost according to the equation. Based on this, detailed calculations can be limited only for these alternatives. Weighted LCA is suitable for calculating the urheimats of Ethnic Sets, Meme Families, and all other cultural replicators that are complex enough so that chance resemblance is unlikely. It can be used, for example, for calculating the likely urheimat of the haplogroup R1b, which is common in West Europe, West Africa, and Caucasus. Based on arbitrary LCA, the likeliest urheimat of R1b would have been in the “humid Sahara”, as all other urheimat candidates would yield a higher Travel Cost, taking into account the fact that Europe was almost uninhabitable during the Ice Age. Such arbitrary results, however, would have to be validated by detailed travel cost networks and by network analysis tools such as QGIS or ArcGIS. In the field of archaeology, Weighted LCA can be used for as an additional method for calculating the likely urheimat of an artefact family based on the incidence (appearance) of the artefact family at different regions.

⁶⁶ The idea of this weight is that the migration of four persons or replicators by 50000 km will probably require a smaller travel cost than the migration of 5000 persons or replicators by

50 km. It matches with the method of using network analysis for calculating the *centroid* of the findings on a map that is a travel cost network instead of a plain geographic map.

Finalizing the urheimat conclusions: After the potential urheimats have been identified based on different methods, it is possible to combine these methods. This can be done, for example, by increasing the WUI of the region, which was concluded as the likely urheimat based on weighted LCA, or which contained the highest diversity of the studied replicator.

Plotting the migration paths: Once the urheimat of a replicator has been identified, its migration to other regions can be modelled with LCA. This method suits best large Ethnic Sets and replicator families that contain relatively complex replicators. The following description applies to Ethnic Sets. The idea is to plot onto the map at the location of the urheimat those replicator families that have their highest Appearance in the identified urheimat. After this, all the *locations of second highest incidence* and locations of highest PopDensity or GeoDensity are marked to the map as Points of Interest (POI). Once they have been plotted onto the map, the urheimat will be connected to the closest POI's via the route that minimizes Travel Cost. After this, all of these connected POI's are connected to those nearby POI's that are not yet connected to the urheimat via an identified path. This is continued until nearby POI's are no longer found. The definition of *nearby* can be based on travel days: A nearby location can be defined as a location that could be reached within 4 months of travel via the fastest route and best travel technology of the studied period. An example of such a migration map has been given in Figure 24, which illustrates the migration of Indo-Asiatic names from India to other regions (p. 172).

Example: The Meme Family of the Swedish Mälär axes

The difference between an Ethnic Set and a Replicator Family is that Ethnic Sets consists of many Replicator Families. Therefore, the identification of the urheimat of an Ethnic Set will usually be based on much larger set of data than the identification of the urheimat of one single Replicator Family. Yet, it is possible to use WUI, Weighted LCA, and some archaeological deduction

methods for inferring the urheimat of a single Replicator Family. Let us take as an example the Swedish Bronze axes of the region of Lake Mälär, focusing at years 1500–1100 BCE. This *Replicator Family* can be nominated as *Mälär axes* (2023, 123–212). These axes, however, have been found also at the Volga–Kama region in Russia in equally high numbers during the same period. Yet, they have not yet been found in Finland, Estonia, or Karelia, which would have been along the way from Sweden to River Volga. Based on WUI, the likely urheimat of the Mälär axes would be either around Lake Mälär or in the Volga – Kama region. Based on Weighted LCA, all locations along the shortest route between Mälär and Volga–Kama region would be equally likely urheimats. As Weighted LCA method does not reveal any valuable information of the urheimat, the Mälär region and the Volga–Kama region remain the likeliest urheimats of the Mälär axes. Due to this, additional analysis of their likely urheimat would be required based on the dating of the findings and based on the diversity of the findings at the Mälär and Volga–Kama regions. It would also possible to extend the study to the Ethnic Set of all bronze weapons and tools of the Mälär region or Volga–Kama region order to identify the likely urheimat of these wider Ethnic Sets.

2.6 *Genealogical trees, cognates, divergence, and glottochronology*

Genealogical Tree is a concept that is used in the DH theory to refer to systematic taxonomical trees that divide interactors or replicators into branches that diverge into lower level groups and finally to the leaves of the tree, meaning the lowest typological level of the interactor or replicator. Genealogical Trees were first developed in biology in the mid-nineteenth century in order to study the evolution of species, in which the *urforms* were the hypothetical ancestors of the present animal species, based on discovered fossils. The general ideas of the *tree model* were then applied in linguistics already during the 19th century for representing language families in the form of *language trees*. In addition, the tree model was then used in the comparative

folkloristics of the 19th century in order to classify the different versions and variants of folktales, and to find their *urform*. In archaeology, the tree model has been used for classifying artefacts and constructions that serve the same function (e.g. spearheads, pottery, and graves). The recommended method for constructing Genealogical Trees in archaeology is the use of statistical methods such as cluster analysis (Carlson 2017, 318-346).

After the discovery of genes, Genealogical Trees were called *phylogenetic trees* in the study of biological evolution, as they were based either on the genes of the studied animals or plants, or on their phenotypes. The tree model can also be used the urforms and urheimats of genetic markers and viruses. It is possible, for example, to study the *urform* of the corona virus that started the COVID-19 pandemic in December 2019, and the *urheimat*, meaning the geographical location where the pandemic started. An even more relevant example of the tree model is the usage of the model for the study of haplogroups and other genetic markers: Each haplogroup starts with a letter, and then diverges into lower level haplogroups, which are represented with a letter and a number (e.g. R1). When additional divergences occur, more letters and numbers are used for identifying each sub clade of the haplogroup (e.g. R1b).

From the point of view of cultural evolution, the most relevant Genealogical Trees are the ones that illustrate the evolution of cultural replicators that appear in the performative form (e.g. spoken stories and acted rituals and customs), etched form (e.g. symbols and written stories), or material form (e.g. artefacts and constructions). In addition, Genealogical Trees that illustrate the branching of haplogroups are important, as they can be used as additional evidence concerning human migrations. The general form of a Genealogical Tree is illustrated by Figure 6 below.

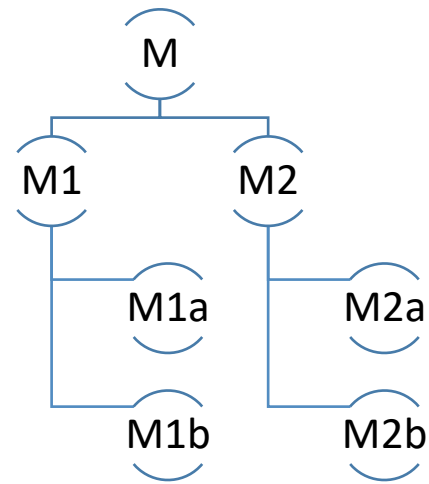


Figure 6: Example of a genealogical tree

The main questions raised by the tree model are the following. 1) What was the urform of the earliest instance of the studied replicator, 2) How and when did it diverge into successor replicators that can be illustrated as branches of the genealogical tree, and 3) What are the geographical locations, from where certain genealogical trees or branches originated?

Anomalies of the genealogical tree model

The first criticism against the tree model occurred within folkloristics, as folktales seem to be evolving all the time adopting narrative elements from other stories. Therefore, it would be very unlikely that one folktale would have just one urform. Therefore, the tree model is not applicable to folkloristics, or alternatively, it can be applied only to the lower level narrative elements and other memes that may have originated from one single earlier source (see Table 11, p. 56, for an example).

In the study of large meme sets, the Genealogical Tree Model will not fit well into situations, in which a population that carries meme set M1 gets into very close cultural contact with a population that carries an alternative or competing meme dry M2. These meme set M1 and M2 can be, for example, lexicons of two languages, culinary cultures of two ethnic groups, two different material cultures, two different, religions, two different sets of customs, or two different sets of methods for producing food. This very close cultural connection can be caused, for example, by the migration of the two populations to the same region. If the two populations are both

equally influential, it is highly possible that after a couple of decades or centuries, the meme sets M1 and M2 have merged into meme set M3, which now characterizes this mixed population of this region. This means that M3 will have two parent meme sets and not just one, which would be the assumption behind the Genealogical Tree Model. In linguistics, a traditional way for handling the close contact of two languages with each other is to divide the words of the studied language into authentic words and loaned words. This model, however, does not fit into a situation in which a new language M3 is born from two equally influential parent languages M1 and M2, inheriting 50% of its vocabulary from M1 and 50% from M2. In such a situation, the proponents of the language tree model would have to flip a coin in order to decide, which words of language M3 were authentic (inherited from M1 or M2) and which ones were loaned (from M1 or M2).

In the study of biological evolution, species normally inherit their genes from only one ancestral species. This makes it easier to draw genealogical trees that describe the evolution of species. However, even that principle does not always apply, as *Homo sapiens* have inherited genes not only from their ancestral species, but also from Neanderthals and Denisovans. This means that even in biology, the Genealogical Tree metaphor should be replaced by the Genealogical Network metaphor.

The highest applicability of the Genealogical Tree model appears within the study of simple memes and relatively rigid memplexes. In biology, it can be applied to the evolution of genetic markers as each instance of a genetic marker has inherited its form from only one single parent replicator. In the study of linguistics, the Language Tree Model is better suited to the study of grammatical, morphological, and phonetic rules, which make the core of the studied language and which form a memplex that is possibly more resistant to change than vocabularies. In the study of archaeology, the Genealogical Tree Model is more suitable to the study of memes and simple memplexes than to the study of entire material cultures. In the field of literature studies and folkloristics, the Genealogical Tree Model suits better to the study of narrative

microelements (e.g. names of the protagonists) or motifs (e.g. characterizations of a protagonist) than to the search of the urforms of stories.

Cognates, peers, and potential cognates

According to the DH theory, two replicators are *Cognates*, if they have a cognitive connection to each other via inheritance or loaning. Inheritance means that the form and meaning of the replicator were inherited from an earlier generation of replicators or interactors, whereas loaning means that an interactor loaned the replicator from another interactor. There is no need to draw a strict line between inheritance and loaning. For example, if a person learns recipe R1 from his aunt and then adjusts it into variant R2, it is irrelevant to ponder whether R1 was loaned or inherited: R1 and R2 are cognates. If a prehistoric person made a copy of stone axe A1 and adjusted it into A2, it is irrelevant whether A1 was a loaned or inherited artefact: A1 and A2 are cognates. In the same fashion, two words W1 and W2 are cognates according to the DH theory, if the form and meaning of W2 originated from W1. For example, the Finnish word *krapula* and the Spanish word *crápula* are cognates, because they originate from the same Greek word *kraipálē* even if Finnish and Spanish do not belong to the same language family and do not have a joint ancestral language. Yet, the meaning of the word *cognate* is so rigidly established in the field of linguistics that it may be better to call the words *krapula* and *crápula* as *Peers* (p. 57) and not as cognates.

After the identification of two replicators as *Peers*, it is necessary to show that they are so complex that it is unlikely that their similarity would have been caused by chance resemblance. In addition, if the cultural replicators were discovered within two distant regions R1 and R2, there is a need for identifying a potential migration path between R1 and R2, or from a potential *urheimat* region to R1 and R2.

Divergence and glottochronology

According to DH theory, the ***Divergence*** of two meme sets occurs when their similarity is first very

high, and then starts to decline. Divergence may occur when one Carrier interactor splits into two carriers C1 and C2, which lose contact to each other due to geographical barriers or due to distance. In this case, the two new Carriers C1 and C2 will carry meme sets M1 and M2, which will have a declining similarity over the following centuries. In this case, M1 and M2 belong to the same genealogical family, as they share the same ancestral urform (memeplex or meme set) from which they descended. If the studied meme sets consist of material memes, it is often possible to date the divergence time by carbon 14 dating, strontium dating, or led isotope analysis. In this case, each instance of the meme set is first dated with the chosen method. After this, it may be possible to identify the oldest instance, and see how it diverged into branches. If the age of the meme sets cannot be measured by physical methods, it may be possible to date the divergence events based on relational expert knowledge, which tells the chronological order of some events without specifying the precise dates (see Hillman 2023). If even such expert knowledge is not available, one suitable starting point for the estimation of divergence times is *glottochronology*. Although this method was originally invented in the field of linguistics, according to the DH theory it can be generalized in order to estimate the divergence time of any two sufficiently large meme sets that originally were part of the same urform meme set. The idea of glottochronology is that the memes of each meme set change at the same rate of change, converting into something completely different at approximately the same speed. Based on this assumption, the time T of the divergence can be calculated with the following equation, and presented as the amount of millennia.

$$T = \frac{\ln(C)}{-L}$$

In this equation, C is the Similarity of meme sets M1 and M2, which can be calculated with a Feature Comparison Table, in which each row contains one meme that belongs to the same stereo-concept (see p. 53–56). L is calculated based on the following equation in which r is a constant that tells the percentage of the memes of the memeplex

that (on average) are replaced by other memes during thousand years of cultural evolution, or mutate their form or meaning so much that they can no longer be considered the same meme as before.

$$L = 2 * \ln(r)$$

This equation was introduced in the field of linguistics by Swadesh (1952), and in that context the value of r was estimated to be approximately 81 %. The equation, however, could be used to estimate the divergence date of other types of ethnic sets as well, as long as these sets are large enough and similar enough. The compared ethnic sets could consist of words, anthroponyms, theonyms, narrative microelements of a story, or recipes of food. If the glottochronological equation is used in a context, in which there is existing expert knowledge concerning some related divergence times, the glottochronical calculations can be balanced or calibrated by taking into account this expert knowledge (see [Holman et al. 2011](#)).

Divergence, however, may also occur when two meme sets M1 and M2 first merged into M3 (see above) and then started to diverge from M3 and from each other. This could appear, for example, when two ethnic groups EG1 and EG2 first carry meme sets M1 and M2, and then send settlers to the same isolated location where they become **Heavily Connected** and merge into ethnic group EG3 that carries M3, which is a mixture of M1 and M2. If the EG1 and EG2 were both equally influential, then M3 would inherit approximately 50% of its memes from both of its parent Carriers. This situation is more nuanced when compared to the assumption that a superiorly powerful ethnic group of people (such as the Yamnaya people) would have entered a geographic region replacing the genes and cultural replicators of the weaker tribe. In addition, it differs from the case in which a group of people would have moved to a practically empty region, establishing its colony there. In the case of *Heavily Connected* meme sets M1 and M2, the similarity $C_{Initial}$ needs to be calculated at the time when M3 started to diverge from M1 and M2 and then C_{Later} needs to be calculated at a specific later moment of time. In order to be able to use the glottochronological

equation, the C of the equation would need to be calculated as C_{Later} divided by C_{Initial} . For example, the decline of Similarity percentage from 100% to 12% is equal to the decline of the Similarity percentage from 50% to 6%; therefore, it will take the same time.

2.7 Summary and suggestions for further studies

According to the DH theory, small mutations and small intentional changes of cultural replicators are likelier than big changes are. In addition, small mutations have a lower probability of being auto-corrected during social interaction. Therefore, the focus in the study of cultural evolution should be at the cumulative effect on small changes of those replicators that cause phenotypic effects on the social interactors that carry them. In order to find the root causes of the changes, one needs to get to the level of mental, physical, performed, and etched replicators instead of just measuring the holistic attributes and statuses of social interactors such as communities, kingdoms, and civilizations. For example, the change of the population size of a human community or kingdom may be caused by a small mutation in the genes of a cultivated crop, or by a small agricultural innovation. In order to find out, what changes are small and which ones are big, we need methods for measuring similarity. Such methods will also be useful for inferring past cultural evolution, as similar replicators are *Peers* and potential *cognates*, which may have inherited their form from the same ancestral *urheimat* in the *urheimat* of the replicator family.

The arithmetic methods of calculating similarity suit best for the measurement of the similarity of meme sets, memes, and very simple memplexes, which can be treated as memes so that they are measured by their holistic properties ignoring the analysis of their parts. The Distance between two memes is roughly equal to their weighted Manhattan Taxi distance divided by the Maximum Distance that has been measured within the studied set of allele memes. The similarity between two meme sets is approximately equal to the amount of similar meme-

pairs, divided by the amount of compared meme-pairs, although a more accurate equation was also presented in this chapter. While calculating the amount of s , those memes of the meme set MS1 that do not have a matching pair in meme set MS2 need to be marked as null-pairs that have zero similarity.

Although the arithmetic methods may be good models for measuring Similarity of two simple memes, they do not simulate the process of human similarity evaluations. The arithmetic methods, for example, require so much calculation that humans will not approach similarity in that fashion. Instead, it is likely that humans and all animal species have developed a sense of similarity, which identifies similar and different patterns and then estimates the level of similarity in just a couple of seconds.

The measurement of Similarity (Meme1, Meme2) based on Variation Rules offers an alternative way for estimating similarity, and this alternative way may have a better match with the process that humans use for evaluating similarities. In addition, the Variation Rules offer a method for the construction of Replicator Families and Ethnic Sets and for the deduction of their *urheimats*. Ethnic Sets are meme sets that consist of those memes that are typical for some specific Carrier, which may be a region, population, or an ethnic group. In addition, the delineation of ethnic sets is based on the assumption that the memes of the Ethnic Set are more common within this Carrier than within other alternative Carriers. Ethnic Sets make it possible to compare Carriers to each other by measuring the Appearance, GeoDensity, and PopDensity of the Ethnic Set within each compared Carrier. Once these indicators are known, it is also possible to calculate the *urheimat* of this Ethnic Set based on the Weighted *Urheimat* Indicator and based on Weighted LCA, which were both described in this chapter.

In some cases, an Ethnic Set may seem to have two *urheimats*. This indicates that it has inherited its memes from two or more Carriers. In some other cases, the calculated *urheimat* is clear, but deviates from the assumed *urheimat* of the meme set. This is valuable information, as it may create an anomaly to the dominant beliefs of the origins of cultures. For

example, it may challenge the idea that most cultural replicators that are currently common in Europe would have originated from the Middle East or from the Mediterranean Region.

Although this chapter started by analyzing the similarities and changes of words, symbols, and other simple memes, this was only a necessary step for advancing to the study of the evolution of entire memplexes such as ideologies, lexicons, and ethnic sets. These larger replicator structures are essential for understanding cultural evolution, as the focus on mere memes is too reductionist and prone to errors that are caused by chance resemblance. In addition, the focus on the level of memplexes is often more fruitful and accurate than focus on entire cultures, as entire cultures rarely migrate from one region to another without mixing with the culture of the destination.

Suggested further studies

In order to develop better methods for identifying urheimats it would be useful to create travel cost networks for Eurasia and Africa for the following periods:

- 1) The era before canoes and boats
- 2) The era of boating before navigation
- 3) The era of navigation over open sea, including navigation across open sea based on the position of sun, stars, winds, waves, and birds.

These maps could then be used for calculating the likeliest urheimats and migration paths of the studied ethnic sets using the methods described in chapter 2.5. A suitable starting point and benchmark concerning these travel cost networks would be the Stanford Geospatial Network Model of the Roman World.

Another important area of further studies would be the development of automated algorithms that would generate Replicator Families and Ethnic Sets based on the Variation Rules that were presented in this chapter, and which would then calculate the

likely urheimats and related migration paths of these Replicator Families and Ethnic Sets. These algorithms could then be used for calculating the likely urheimats of specific material cultures, artefact styles, or symbol systems. The automated algorithms would also make it easier to choose the right parameters for the model, as the effects of small parameter changes could be rapidly simulated.

In addition, there is the need to form practical guidelines for plotting the migration paths based on the similarity of two discovered similar memes and based on their distance. In this study, the principle was that simple replicators do not prove migration even if they appear at distant locations in identical form, but complex replicators that appear in approximately same forms in distant locations do prove migration (e.g. haplogroups and other genetic markers). A suggested solution would be to create a table in which the different complexity levels of replicators are matched with the maximum amount of travel days, which would still permit the inclusion of the two similar replicators to the same replicator family and their connection with migration arrows. The creation of such a table might require a quantitative model that would measure, how likely it is that a certain simple, complicated, or very complicated replicator would emerge randomly during a specified period within a population of specific size and heterogeneity. For example, the study of Ancient West African names revealed that the place names *Masure*, *Barisa*, and *Magi* appear close to each other in India and in West Africa (p. 184). Yet, there is no quantitative model that would tell, how likely it would be that such a phenomenon would appear without cultural contact between these two regions.

In addition, there is the need to apply the principles of Similarity calculation, Variation Rules, and glottochronology in the field of linguistics and onomastics in some improved ways that would handle the challenges that have been described in this chapter. This is done in the next chapter.

3 Applying the DH theory to the evolution of languages, words, and names

3.1 Objectives and starting points

The first objective of this chapter is to form a theory of the evolution of languages, words, and names, in order to lay a foundation for the onomastic study of chapter 5. This theory is derived from the DH theory and from *usage-based linguistics*,⁶⁷ according to which languages are naturally evolving systems and not theoretical systems that would form nice language trees and clearly delineated lexicons, as is commonly assumed within comparative linguistics. By combining Dawkinsian evolution theory and discourse analysis to usage-based linguistics, a new interpretation of *evolutionary linguistics* is formed, taking distance to sociobiology and natural selection, and paying more attention to cultural replicators and socio-cognitive selection processes.

The second objective of this chapter is to create two methods called *Improved Lexico-statistics* and *Improved Glottochronology* for serving the following purposes:

- Measuring the similarity of two words or two languages
- Generation of Name Families that consist of names that are Peers (and potential cognates)
- Identification of the urheimat of a Name Family or an Ethnic Name Set
- Estimation of the divergence time of two languages that were either part of the same language family or otherwise heavily connected to each other

After the formulation of these methods, they are put to test in two brief studies, which investigate the following topics:

- The similarity of the Basque language with some Dravidian languages
- The etymology of the name *Gadeirus*

The methodological starting points of this chapter are *lexico-statistics* and *glottochronology* (Swadesh 1952), the method of the *Automated Judgment of*

Lexical Similarity (Holman et al. 2011), and Vakulenko (2022), which contains a method for measuring the distance between two IPA phones. These methods are integrated to the DH theory in the following chapters. The empirical starting point of this chapter is Lahovary (1963, 374), according to which the Basque language has an approximately 50% similarity with the Dravidian language group. As these similarities seem anomalous to the mainstream ways of forming language families, there was a need for a critical review of such results. Before advancing to the empirical studies, this chapter first presents a general theory of the evolution of languages, words, and names, and then proceeds to introducing Improved Lexicostatistics.

3.2 Phases in the evolution of languages

According to the DH theory, the first step in the evolution of a language is the creation of concepts, which originally exist as mental representations even before any words and signs (see p. 23). For languages to emerge, the concepts need to be connected to communicable labels such as words and signs.

The earliest communicable labels in the evolution of languages were probably *performatively* represented sounds, utterances, gestures, and signs. Dolphins, for example, are able to invent sounds that they use as labels in order to refer to themselves (Janik et al 2006). In a similar fashion, deaf children can invent signs for an emerging sign language, and use these signs in order to communicate with others (Shepard-Kegel 2018). Simplified drawings, which could be rapidly drawn onto sand, were probably another early form of communicable labels.⁶⁸ An important process in the evolution of language is *social standardization*, which means the implicit social agreement on the correct forms and meanings of the labels based on their cumulative usage in a community of speakers. One part of this social

⁶⁷ Langacker 1987, etc.

⁶⁸ *Depiction*, see Renfrew & Bahn (2012, 390).

standardization process was also the standardization of the phones of the language. Social standardization is partly based on the tendency of the members of the population correct each other when deviations to the form or meaning of words or to the form of phones appear in communication.

After labels have been invented and socially standardized, the next step in the evolution of a language is the evolution of morphology and grammar. Morphology means the ways in which parts of word can be connected to each other in order to generate new meanings, and grammar means the ways in which words can be conjugated and connected to each other to form sentences. Morphological innovations can increase the size of the vocabulary of the language significantly, which makes it possible to communicate meaningful messages with shorter sentences as complicated concepts can be represented with one single word. In the DH theory, words are considered memeplexes that consist of the *core* and optional prefixes, suffixes, conjugations, and components. Even the core of a word can be usually divided to elements, such as the phones.⁶⁹ In parallel with morphological innovations, grammatical rules emerge, guiding and standardizing the way in which words are combined in order to form sentences. This will make sentences easier to understand. In addition, grammatical rules that replace longer sentences with shorter expressions make communication faster. Once the language has developed a grammar, it is also possible to create abstract concepts, which do not have a direct connection to observable things. Instead, the meanings of these abstract concepts are explained with sentences. Abstract concepts are important, as they make it possible for a group of speakers to imagine and plan the “far future” without observing it, and to motivate themselves to great efforts in order to reach some imagined abstract goal or status (e.g. reaching Valhalla or a paradise in the process of a successful war).

Dating the phases in the evolution of languages

According to Nichols (1998), the first spoken languages evolved around 350,000–150,000 BP in Africa, which matches with the archaeological findings, according to which human behaviors and cultures became increasingly complex during that time. According to Hayes (2014, 31), the emergence of words speeded up communication in human populations, and improved significantly abstract thinking during the early phase of cultural evolution. According to Perreault and Mathew (2012), the current worldwide pattern of phonemic diversity contains a potential statistical signal, indicating rapid development of language some 60,000–70,000 years ago. This period matches with the time when Homo sapiens started to advance to regions that had previously been occupied by Neanderthals (see Lambeck et al. 2011). This suggests that the invention of a more complex and mature language would have made it possible for Homo sapiens to plan larger military operations and to organize and motivate larger groups of people. This would then have created a competitive advantage for the Homo sapiens populations over the Neanderthal populations.

According to Wichmann (2023), the diffusion speed of languages increased around 3000 BCE in Eurasia and Africa. This matches the time, when the memeplex of Chieftainship, combined with the invention of seaworthy sailing boats, started to “shrink the world” by connecting distant cultures to each other (p. 41).

The evolution of a language can be observed by measuring the way in which the studied language invents, changes, or loans its words, morphemes, phones, and grammatical features. In addition, the evolution of a language may lead to its divergence into child languages. According to the DH theory, a language can diverge into several child languages, but one single language can also have several parent languages (see 2.6). In a similar fashion, also a single word can have two or more parent words

⁶⁹ The concept of a *core* differs from the concept of a base word, as the base word can contain hypotheses that relate to the root of the word. In DH theory, the concept of a core refers

simply to the fact that some part of the word is so nuclear that it can no longer be divided to smaller parts, although it can be divided to syllables or phones.

(e.g. *Spanglish*). Although it is possible that languages and words have two parents, it is more common that new languages and words emerge from one single language or word. Therefore, a genealogical language tree can be used to illustrate the evolution of languages and words, even though a genealogical network would provide a more accurate representation

3.3 *Survival of names through millenniums*

Names are words that refer to a specific person, place, or *thing*, which can be a brand, god, or some other phenomenon that deserves to be written in capital letters. This last feature of names depends on the cultural context. The names of months and weekdays, for example, are considered as names in some cultures whereas in other cultures not ([Ainiala et al. 2016](#)). Names tend to consist of a *core* and of *connected components*, which can be descriptions, patronyms, code names, secret names, etc. The core of a name can have a descriptive meaning in some language, but in many cases, the core of the name is *opaque* so that it does not have a clear meaning. An example of the core of a name is the name that a young dolphin invents for itself: It is just a sound, with no other meaning than the reference to the carrier of the name ([Ainiala et al. 2016](#)). According to the DH theory, the first names were mono-referential sounds, utterings, gestures, or signaled signs. These first names were simple in such a fashion that they consisted of only the core that was not connected to any additional components.

The main function of names is to identify their carrier, meaning the person, place, or brand that carries the name ([Ainiala et al. 2016](#), [Coates 2017](#)). Another function is to bring luck, success, and allies to the carrier of the name – or the opposite, in the case of a malevolent nickname. This objective can be pursued by giving names that have a positive meaning or connotation, or a negative meaning or connotation when inventing nicknames for unpopular characters or places. Positive meanings require that the name has a meaning, but positive

connotations can be given also to opaque names. This occurs commonly via the influence of stories and ancestor lists. The protagonists of stories have a name that is likely to be given also to members of later generations. A third function of names is to cherish the identity of an ethnic group or family by giving a person or place such a name, which has been traditional within that specific ethnic group or family. This means that the name was common or otherwise very important, for example, due to some important stories that carried that name. According to onomastic studies, especially people with higher level of education and social status tend to promote names of their ancient ethnic background, as they see these names as construction blocks for the identity of their child.

Two more objectives or requirements for names are *beauty* and *ease of replication*. These requirements are sometimes in conflict with each other, which will lead to a situation in which a long and beautiful name is replaced by a nickname in casual speech, but the beautiful name may still have a chance of being passed to next generations via the traditions of name giving. The functions of a name determine what kinds of names are likely to succeed in the evolution of names. In principle, names that serve important functions and are not too difficult to memorize and replicate will survive in the evolution of names. This means that most successful names in cultural evolution are likely to be names that are beautiful, easily replicated, and contain a positive connotation due to the stories that contain the name. A successful *anthroponym*⁷⁰ does not need to have a meaning that would be known by the carriers of the name. Yet, such opaque names have often appeared in cultural evolution in connection with bynames that had a clear descriptive meaning.

Stages in the evolution of names

According to the DH theory, the evolution of naming cultures has a close link to population density and migration. In addition, it has a link to the evolution of the memplex of *Chieftainship* (see p. 41). Due to these connections, naming cultures

⁷⁰ Name that refers to a human person

have advanced via the following stages, although some stages may exist in parallel at different regions of the world.

Hunter-gatherer stage: The first part of this stage occurred approximately 350,000–150,000 BCE. During this period, names were mostly mono-referential names that did not carry any other meaning than the reference to a specific person. This is because spoken human languages had not yet evolved to a mature state, and a large part of hunting-related language was spoken with signs.

The early monoreferential naming culture changed approximately 150,000–60,000 BCE into a descriptive naming culture. In this culture, names that had a lexical meaning were dominant both for anthroponyms and for place names. This is based on the study of Alford (1988), according to which descriptive anthroponyms that relate to the phenomena of the nature are dominant within hunter-gatherer populations.⁷¹ Yet, the descriptive naming cultures would have carried also some older opaque names that either never had a meaning or for which the meaning had been forgotten over the generations.

One naming principle that promotes opaque names is based on the worship of ancestors and ancestral spirits. Based on these religious customs, names of significant ancestors from the distant past were commonly given to children in order to honor the ancestral spirits or to summon the spirits to protect and favor the child. In these naming cultures, the “meaning” of the name would have been constructed via the stories that relate to the ancestor and not via lexical and etymological descriptions that would have specified the meaning of the name (see p. 23).

In addition to anthroponyms, the early hunters and gatherers also needed to use *toponyms*⁷² in order to plan hunting and gathering activities and to communicate where some valuable natural resources would be accessible. The most valuable and most easily identifiable places evolved gradually into macronyms, which were known by several human communities.

Already during the hunter-gatherer stage, the following mechanisms promoted the survival of anthroponyms and place names for very long periods without major changes:

1. Place names at constantly inhabited areas had a high chance of maintaining their spoken form even if the original meaning of the name might have been forgotten. This is because the accurate replication of place names was important for the communication concerning the location of hunting grounds, pastures, fishing places, and places of trade and social interaction.
2. Place names that appeared in important route descriptions and travel stories were easily remembered, as their correct communication reduced the chances of getting lost. At the absence of maps, route instructions were given by describing in correct order the intermediate destinations that had to be reached in order to reach the final destination.
3. Anthroponyms, which appeared as protagonists in important stories, were remembered relatively easily. This is because an interesting story is easy to remember and because the names of the protagonists are repeated various times in these stories. The names of the protagonists and other sympathetic characters also carried a positive connotation. Therefore, their names were often given as names to children, even if the meaning of the name may not have been known. In addition, the stories that told about the history of a family or an ethnic group were important to the identity of this group. This means that the names of the ancestors were given to children in order to maintain and strengthen the identity of the group.
4. Anthroponyms that were carried by important rulers or ancestors were commonly converted into the name of their tribe. For example, the tribe of the *Romans* may have received its name from the name of *Romulus*. Once a tribe became more widely known, its name often converted also into the name of the region that was occupied by the tribe.
5. Simple names of just one or two syllables were easy to remember, and therefore survived well in the cultural evolution. However, when

⁷¹ Source: Ainiala et al. (2016, 127).

⁷² place names

human communities grew, they were often combined into combination names such as *Sakir-Har*.

6. The *law of self-correction* (p. 35) helped in the survival of those names that appeared in important and widely distributed stories.
7. When names changed via mutations, this usually created variation but did not cause the original name to become extinct. Due to this, names become extinct much slower than common nouns, which may be completely replaced by a newer variant in the evolution of a language.
8. Although names may have become extinct in some region due to phonological changes, the authentic and unchanged original name may migrate from other regions back to the region where it became extinct.

An example of the seventh principle is the Proto-Dravidian word *pul* (“Tiger”). It no longer exists in any Dravidian language, as it has been replaced by *puli*, *huli*, and *bāgh*. Yet, the name *Pul* still exists as a forename in the countries that are highlighted with red or orange in Figure 7 below.

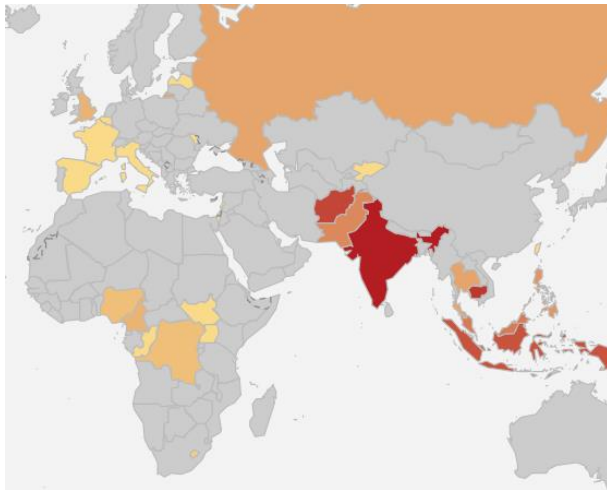


Figure 7: Geographic distribution of forename Pul (“Tiger”)

This means that the name *Pul* has remained the same at least 5000 years although the name has also diversified into several other variants.

Neolithic stage: Once people settled down and communities grew, simple names that consisted only of the core of the name were no longer

sufficient to identify people. This led to the elaboration of the core with some additional components such as an adjective, or a short description. Examples of such additional components are the bynames “the Small” and “the Blue Tooth”, and the patronym “Johnson” (John’s son). When Neolithic populations extended by founding colonies, the place names in these colonies were often copies of some place names of the original homeland, preceded by the extension “New” (e.g. New York). Sometimes these additional adjectives were also added to existing place names, in order to specify a part or variant of the place name.

After the development of the first Bronze Age civilizations, a growing proportion of ancient descriptive names lost their original meaning. This was caused by the increasing migration of people from the peripheral regions to the growing Neolithic settlements, and by the migration of people from the overpopulated centers to new colonies. The Indus Valley, for example, received human genes and anthroponyms from all directions received genes from all directions around year 5200 BCE.⁷³ Due to the higher volume of migrations, more and more first names acted only as labels without a clear descriptive meaning, and only the byname that was added to the first name contained a meaning. The original and authentic meanings of first names were replaced with speculative meanings and by references to stories of persons who had carried that name. For example, the meaning of the name *Heracles* would have been most commonly interpreted via the stories that told about his heroic acts, and only some scholars might have been interested in etymological speculations of the original meaning of the name.

During the Neolithic stage, the principles 1–6 of the Hunter-gatherer stage still protected names from notable mutations. In addition, the sedentary nature of these communities introduced three additional processes that protected names from extinction:

9. Anthroponyms were often converted into place names, in which the place name was first

⁷³ Genetic Atlas of Human Admixture history, Burusho(Full analysis:second event); Retrieved 2022-05-09

formed as a genitive expression of the place or house of the person, and then later on truncated into one word. For example, the name of the Finnish municipality of *Halikko* originates from the German name *Halico*, which probably first turned into the genitive place name *Halikon kylä* (“Halico’s village”) and then into the shortened version *Halikko* based on the tendency of people to simplify longer names. The storage of anthroponyms into place names protected these names from extinction as place names can better resist ethnic cleansing than anthroponyms. Although a conquering tribe or empire can easily change a big part of the name pool of the region, it is unlikely to change the large variety of the place names, although some major cities can be renamed to suit the taste of the conquerors. In addition, the storage of anthroponyms into place names protected the names from change, as it is important for people to replicate place names with accuracy in order to give good travel route instructions that prevent people from getting lost.

10. Names of houses, homesteads, and villages often converted into bynames, which were sometimes carried to next generations as surnames. For example, there may have been a house called *Casa nova* (“New house”) which first converted into a place name *Casanova*, which then converted into a surname. The conversion of place names into anthroponyms made it possible for local place names to migrate to distant regions along with the migrants; in these new regions, the anthroponyms could then convert back into place names.
11. People who migrated to a distant region tended to have a high motivation for preserving their ancestral names actively as anthroponyms and as place names in their new surroundings. They tended to favor the names of their original culture, as they wished to pass their ethnic identity also to their children. When naming new settlements, they commonly used the method of naming some place as “New X” where X is a name of a place from the previous location of their family. Based on the principles of cultural evolution, this New X will then later on be shortened to “X” when people no longer consider this place as something new. After this process, the name X

would have migrated to a new region, maintaining its original form.

Interregional stage: During the Interregional stage, the migrations of people and names increased, partly caused by the memplex of Chieftainship (p. 41). One special feature of this memplex was the desire to become immortal by turning oneself into the protagonist of an immortal story (see p. 41). This motivated people to participate in long-distance expeditions and long-distance trade, which commonly led to the founding of colonies into uninhabited locations or into existing communities of far-away lands. This increased the proportion of opaque and non-descriptive first names. This increased also the proportion of opaque surnames and place names, because the opaque first names tended to convert gradually into family names and into opaque place names.

In interregional naming cultures, few people know the original and authentic meaning the anthroponyms and place names. For example, the city of *New York* has *York* as its core and *New* as its descriptive connected component. Although this descriptive component has a meaning, the core of the name *York* does not have a descriptive meaning for the international community that uses the place name *New York*. Even if some etymologist were to state that *York* would have an original and authentic meaning, this would just be a theory that could be a more or less accurate description of the origins of the word. According to the DH theory and according to usage-based linguistics in general, an anthroponym or place name no longer has a meaning when the users of this name no longer know the meaning or agree about the meaning. This conclusion resembles the way in which Rappaport (2012) considered it more important to study the functioning of symbols and cultural replicators than to study their original meaning.

In interregional cultures, ethnic minorities often have an increased motivation for naming their children with names that have appeared in their culture for centuries or millennia. This naming culture connects the child to the ethnic group, and increases group cohesion. Yet, the names of ethnic minorities remain opaque to the majorities of the

region. Once a name becomes opaque, its evolution will be determined by Variation Rules, which create variation, and by the functions of name, which steer the socio-cognitive selection that determines, which names will survive in cultural evolution. As opaque names became common already during the Neolithic stage and very common during the International stage, the Variation Rules are relevant especially for the study of names that were used after year 5000 BCE.

Naming cultures after the interregional stage

After the emergence of the interregional stage, several interregional and localist cultures have existed in parallel. In addition, several additional factors have had their effect on the evolution of names. The descriptions of these cultures and factors intend to generalize instead of going into the details of some specific regional naming cultures.

Localist naming cultures: After the Bronze Age, there have been several collapses of the interregional system of trade and migration. These have reverted the naming cultures of some regions to an introverted and localist naming culture. Additional memes that match with this memplex include nationalism and xenophobia. During these periods of collapse, the inflow of new names to local populations is reduced due to reduced migration and due to the preference of local names. During the Localist stage, the driving force in the evolution of names is mutation. Although the local names that appear in local traditions are protected against mutation by the law of auto-correction, the localist ethos of the culture does not protect foreign-sounding names from mutation. On the contrary, their active phonetic changes are promoted to some extent. In addition, due to the more xenophobic nature of the local cultures, immigrants do not have the power to defend their names against mutations: They will have to accept the mispronounced and misspelled variants of their own name, and soon these new variants may replace the original and more correct variants.

Imperial naming cultures: These naming cultures have existed during the Neolithic and Interregional stages. They promote the names of the core region

of the empire, as the members of the conqueror culture tend to have a higher social status than the people of the periphery have. In some cases, the heroic names of the conquered culture become politically incorrect; they can be seen as indication of separatism and rebellions. This may lead to the semi-voluntary replacement of ancient anthroponyms of the periphery with the names of the conquerors. This phenomenon can still be seen in the way in which the Indigenous people of Latin America often favor European sounding anthroponyms for their children. This is only rational, as the names that sound too ethnic are likely to be a disadvantage when people apply for jobs. In some cases, empires have actively replaced all local place names with names that are more imperial and politically correct. This has occurred, for example, in the Russian Karelia, where the old Finno-Ugric place names have been commonly replaced by Russian names. The imperial discrimination against ethnic names would normally be weaker against those names that do not contain a clear connection to some important hero or god of this local ethnic culture. The Romans, for example, would have probably tolerated better the name of a Celtic hero of year 1000 BCE than the name of a hero who arranged a revolt against the Romans.

Strong monotheist movements: In parallel with the stages of naming cultures, some strong monotheist movements have effectively replaced ancient and pagan names with non-pagan names within their sphere of influence. This phenomenon could partly explain why the ancient Bronze Age names of the Middle East have survived better outside Middle East than within Middle East (see chapter 5.6 and p. 180). In addition, it could explain the popularity of the Biblical names all around the world within Christian, secular, and multicultural regions.

Progressive naming cultures: In many regions of the world, modernism has won the competition against the valuation of old traditions and names. This modernism is often combined with the promotion of internationalism, which is reflected to the favoring of international names over local names. Although the term “progressive” has a positive connotation, the progressive naming

cultures of the 20th century have led to the extinction of several names that have been used for thousands of years. In the more conservative naming cultures, ancient names have a better chance of survival on the long term.

Practical naming cultures: These naming cultures tend to be connected to the progressive naming culture. In these cultures, names that are difficult to pronounce by the international community are discouraged. In addition, names that are difficult to write in Latin alphabet are at the risk of becoming less common.

Deriving predictions from the DH theory

The occasional transformations of interregional naming cultures into post-interregional naming cultures pose a challenge to etymologists and to the scholars of onomastics. There is a risk that the focus on some localist, imperial, monotheist, or progressive naming cultures will give the false impression that *anthroponyms change constantly at a fast rate*. If the scholars focus on some localist naming cultures, they may also generalize that *long distance migrations of persons and names were always uncommon before the 20th century*. In addition, if they focus on the names of hunter-gatherer populations, they may conclude that *all names originally had a descriptive meaning*. All of these conclusions are incorrect according to the DH theory. When these conclusions are combined, they lead to the conclusion that *the root and meaning of each name should be searched for from the local geographic region and language*, where the name is currently found. Chapter 3.6 shows, how this hasty conclusion can be corrected.

According to the DH theory, anthroponyms and toponyms are persistent in cultural evolution due to the 11 processes that increase the fidelity of names and reduce the chances of names to become extinct in the evolution. The only exceptions to this rule appear in localist, imperial, monotheist, and progressive naming cultures. Yet, even in these cultures, some ancient names will survive thousands

of years due to the 11 processes that keep ancient and prehistoric names alive.⁷⁴

The survival of names for millenniums requires that the name is carried by a place name, tribal name, ancestor list, or a story, and that this name, list, or story spreads to several cultures that speak different languages. After such diffusion, the same name that becomes extinct within one local culture and language may very well migrate back to a culture in which it became extinct (see p.36). Such repetitive re-entry of names to local cultures will protect them from global extinction, even if the phonetic sound-changes of local languages may replace a name with some other variant, causing the local extinction of the original name.

3.4 Introduction to Improved Lexico-statistics and its predecessors

Improved Lexico-statistics is a new or improved method that is based on two existing linguistic methods for measuring the similarity of two words or two languages. The two improved methods are *lexico-statistics* (Swadesh 1952) and the *Automatic Judgment of Lexical Similarity* (Holman et al. 2011, 3).

Lexico-statistics: The general principle of lexico-statistics is to compare two languages to each other by forming a list of 100–200 basic concepts that appear as words in the compared languages (Swadesh 1952). Once this list has been confirmed, the words of the compared languages that match the concepts of the list are compared based on their form and meaning. If the form and meaning are sufficiently similar, they are concluded as *potential cognates*. After this, the similarity of the languages is calculated with the following equation:

$$\text{Similarity} = \frac{\text{Amount Of Potential Cognates}}{\text{Size of the Swadesh list}}$$

Based on this method, the Basque language was compared to several other languages by Tovar

⁷⁴ According to lexicostatistics, ~20% of words, on average, will survive for a millennium. If names are more resilient, this percentage could be much higher for names.

(1961, 259). Table 15 on page 79 shows these similarities as a lower and higher estimate because Towar used two different Swadesh lists for calculating the similarities and these lists yielded different results. The problem of the method for calculating similarities in lexicostatistics is that the concept of a *potential cognate* is not defined in quantitative terms, and therefore, different linguists reach different conclusions about the amount of potential cognates in the compared languages.

Table 15: The similarity between Basque and some other languages (Tovar 1961, 259)

Language	Similarity percentage (lower estimate)	Similarity percentage (higher estimate)
Southern Berber	7.38	10.86
Riffian Berber	6.00	9.67
Kirrucaskan	6.62	7.52
Coptic	5.18	6.59
Georgian	4.73	7.52
Arabic	3.26	4.90
Egyptian	2.29	3.35

The problem of potential cognates cannot be solved by replacing the idea of *potential cognates* with *likely cognates*. The proving of two words as likely cognates is challenging, unless one has first proven that the compared languages belong to the same language family; this is very difficult, unless one can first show that the languages share many cognates. Basque, for example, has been classified as a language isolate, which means that it is not related to any other language, which means that it cannot have cognates with other languages. This means that it cannot have a genealogical connection to any other language, which is a tautological conclusion. One solution for this problem is to stop using the concept of *potential cognates*, and to speak of mere *similarity*.

Automatic Judgment of Lexical Similarity: In this method, two languages are compared to each other by the use of linguistic databases, which contain standardized concepts that are presented in different languages (Holman et al. 2011, 3). In these

databases, the standardized concepts are labels that mark stereo-concepts, which appear in all or most of the compared languages. In *Automatic Judgment of Lexical Similarity*, the meanings of all words that fall within this specific stereo-concept are assumed the same. For example, the meaning of the English word *uncle* and the Finnish word *eno* would be considered equal, although *uncle* means the brother of someone's parent, and *eno* means the brother of someone's mother. After this assumption, the written forms of the compared words are compared by measuring their *Levenshtein distance*, which is calculated as the weighted sum of single character edits that are needed to close the gap between the words.

$$Lev. Distance = \sum_{edit=1}^n Weight_{edit}$$

The weights of the edits are such that *substitution* of a character has the weight of one, and *insertion* and *deletion* of a character both have the weight of 0.5. After the distances have been calculated along all the word-pairs of the compared languages, the total distance of the two languages can be calculated with the following equation, in which n is the amount of compared word-pairs.

$$TotalDistance = \sum_{pair=1}^n Lev. Distance_{pair}$$

If the TotalDistance of two languages is small, the languages can be considered similar. The method has defects and benefits. The rules for calculating the Levenshtein distances are very crude so that they consider the change from “c” to “k” as an equally big change as the change from “o” to “p”. Yet, the calculated Total Distances between the languages have proven to be relatively good proxies for the distances of two languages. Based on this simple and automatable method, it is possible to calculate the similarities of hundreds of different languages. Based on these similarities, it is then possible to create language trees that locate similar languages to the same branch of the language tree. When these language trees are compared to the language trees that have been constructed linguistic expert

knowledge, the similarities are very big (Holman et al. 2011). This means that it is possible to construct language trees with objective methods based on simple rules, avoiding the problems that relate to the subjectivity of the formulation of potential cognates based on expert knowledge. As very crude Variation Rules can yield such promising results, it is only logical to conclude that a method that would use better Variation Rules would yield even better results.⁷⁵

Improved Lexico-statistics: This is an improved version of the way in which two languages are compared to each other in *Automatic Judgment of Lexical Similarity*. In Improved Lexicostatistics, the similarity of two languages is calculated based on a predefined sample of concepts such as a Swadesh list. Yet, there is no need to seek for such concepts that would be unlikely to be loaned from other languages, as the similarity of two languages can be caused equally well by loaned words or by the descent of words from an ancestral language. (Improved Lexicostatistics is not focused at the search of descended words).

Once the sample of word-pairs has been confirmed, the Similarity percentage of all words pairs should be calculated. After this, the similarity of the compared languages can be calculated as the sum of the Similarity percentages, divided by the size of the sample. In Improved Lexicostatistics, the calculation of the Similarity percentages resembles Automatic Judgment of Lexical Similarity, as it is based on automatable rules and procedures. This makes Improved Lexicostatistics more transparent and reproducible than the traditional forms of lexico-statistics. Yet, the method of Improved Lexicostatistics intends to use more advanced rules than Automatic Judgment of Lexical Similarity. In addition, Improved Lexicostatistics recognizes the differences in meanings also in those cases in which Automatic Judgment of Lexical Similarity would consider two concepts as identical. In order to

measure the Similarity percentage of each word-pair, the following equation is used:

$$\text{Similarity} = \text{Similarity}_{\text{form}} * \text{Similarity}_{\text{meaning}}$$

An alternative method for calculating the Similarity of two languages in Improved Lexicostatistics is to start with a list of similar words that has been identified by a scholar of linguistics based on predefined sample (e.g. a Swadesh list). In this method, the Similarity percentages of all of the identified word-pairs are calculated and then the sum of the Similarity percentages is divided by the size of the sample. This method is suitable for doing a critical review of the lexico-statistical similarity conclusions that have been made by the reviewed scholar of linguistics, as the method gives lower weight to those word-pairs in which the Similarity is lower. The methods for measuring Similarity in Improved Lexicostatistics are described below.

Similarity of meaning: According to Improved Lexico-statistics, the similarity of meaning can be calculated in a relatively objective and reproducible manner by the use of artificial intelligence. One possible method is to ask *Chat GTP*⁷⁶ the question: “Can you show me a hierarchal tree structure that would contain in its typological hierarchy the concepts X and Y?” Once this tree has been formed, the similarity of meaning can be calculated with the following equation, in which *Route Length* is equal to the amount of steps that are required to move from *Meaning1* to *Meaning2* along a hierarchal tree of concepts:

$$\text{Similarity}_{\text{meaning}} = 1 - \max(0; 10\% * \text{RouteLength})$$

For example, the similarity of the concepts *king* and *police* can be calculated based on a conceptual tree, in which the distance between these concepts is four steps (Figure 8, p. 81). This means that their Similarity is 60%.

⁷⁵ According to Wichmann (2023), the variation rules of the Levenshtein distance are only the very first step towards building better variation rules and towards building an

improved version of Automated Judgement of Lexical Similarity.

⁷⁶ For example, the GTP Chat of Microsoft Bing.

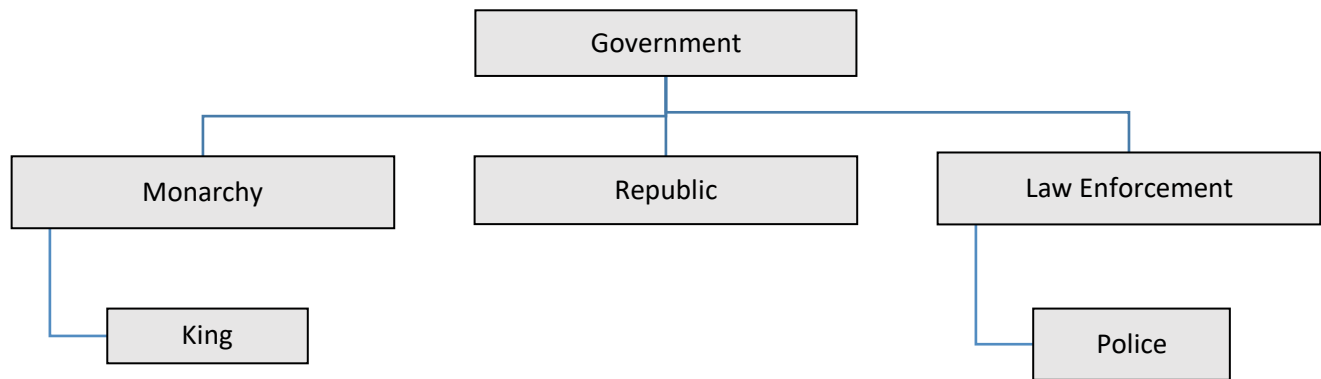


Figure 8: Hierarchical conceptual tree that combines the concepts “king” and “police”

Similarity of form: According to Improved Lexico-statistics, two spoken words are strings of phones. This means that their similarity can be calculated by the use of Variation Rules (p. 58) or by the methods for comparing two similar strings (p. 50). The following chapter shows how the Similarity of form of two words can be calculated based on Variation Rules, in order to calculate the total Similarity of two words. As this calculation is a complicated task, an entire chapter is devoted to it.

3.5 Measuring the distance between two spoken or phonetically written words

Spoken words are strings of phones, and written words are strings of symbols. Yet, there is a third category of words: the phonetically written words. In these words, each written symbol matches with one specific phone. A large part of the human population speaks a language that is not written with Latin letters. This means that when the words of these languages are written with Latin letters, they are transcribed into phonetic writing: Each Latin letter represents a matching Latin phone in the International Phonetic Alphabet (IPA).

Improved Lexico-statistics is based on the assumption that Latin letters are approximates of the *Latin phones* (see p. 48), and that people tend to write unknown words of an unknown language with Latin letters as if the Latin letters were Latin phones, although the linguistic background of people may have an effect on the way in which people write.

Most people, for example, would write the phone /s/ with the letter “s” but some might use another letter based on their background. According to Improved Lexico-statistics, the similarities of phonetically written words can be calculated based on Variation Rules that follow the principles given in chapter 2.3.

In Improved Lexico-statistics, the compared words are first reduced to their *core* by removing prefixes, suffixes, and conjugations, if such morphological structures are known. In addition, compound words are reduced to their individual components (words). During this reduction, no changes to the content of the core should be made, which means that mispronounced and misspelled cores should be left as they are. Once the two compared words are reduced to their core, they can be compared either based on the method of comparing two strings that share a sequence (see p. 50) or based on Variation Rules (p. 84). Both of these methods require that the similarities of phones be first calculated. According to Vakulenko (2022), the similarity of two phones can be measured by interpreting the IPA alphabet as a phonetic space that has 15 attribute-dimensions, and by calculating the Euclidian distance between the compared phones based on these dimensions. Vakulenko first converted the phones along these dimensions into numbers between zero and one, except for the dimension p_h (horizontal position), for which he used values that were higher than one. After this, he presented all the IPA phones in a table that showed their values along the 15 dimensions, ignoring the exotic sounds of the extended IPA

(2022, 11-12). The values that Vakulenko calculated have been shown in Table 16 below, focusing at those *Latin phones* that are represented with a letter of the Latin alphabet.

Table 16: Quantified IPA characteristics of those phones that can be represented with Latin letters

phone	Attribute-dimensions														
	p _h	p _v	p _r	p _{voice}	p _{nasal}	p _{pret}	p _{hom}	p _{sib}	p _{lat}	p _{trill}	p _{cont}	p _{pul}	p _{eject}	p _{click}	p _{impl}
a	5/12	0	0	1	0	0	1				1	1			
ä	3/8	0	0	1	0	0	1				1	1			
o	1/3	1/3	1/2	1	0	0	1				1	1			
e	5/12	1/3	0	1	0	0	1				1	1			
i	5/12	1/2	0	1	0	0	1				1	1			
y	5/12	1/2	1/2	1	0	0	1				1	1			
u	1/3	1/2	1/2	1	0	0	1				1	1			
q	1/4	1	0	0	0	0	1/2	0	0	0	1/2	1	0	0	0
c	5/12	1	0	0	0	0	1/2	0	0	0	1/2	1	0	0	0
k	1/3	1	0	0	0	0	1/2	0	0	0	1/2	1	0	0	0
g	1/3	1	0	1	0	0	1/2	0	0	0	1/2	1	0	0	0
h	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0
x	1/3	1	0	0	0	0	1	0	0	0	1	1	0	0	0
s	2/3	1	0	0	0	0	1	1	0	0	1	1	0	0	0
t	2/3	1	0	0	0	0	1/2	0	0	0	1/2	1	0	0	0
d	2/3	1	0	1	0	0	1/2	0	0	0	1/2	1	0	0	0
z	2/3	1	0	1	0	0	1	1	0	0	1	1	0	0	0
m	1	1	0	1	1	0	1	0	0	0	1	1	0	0	0
n	2/3	1	0	1	1	0	1	0	0	0	1	1	0	0	0
r	2/3	1	0	2	0	0	1	0	0	1	1	1	0	0	0
l	2/3	3/4	0	1	0	0	1	0	1	0	1	1	0	0	0
f	11/12	1	0	0	0	0	1	0	0	0	1	1	0	0	0
v	11/12	1	0	1	0	0	1	0	0	0	1	1	0	0	0
p	1	1	0	0	0	0	1/2	0	0	0	1/2	1	0	0	0
b	1	1	0	1	0	0	1/2	0	0	0	1/2	1	0	0	0
j	5/12	3/4	0	1	0	0	1	0	0	0	1	1	0	0	0
w	1+1/3	3/4	3/4	1	0	0	1	0	0	0	1	1	0	0	0

The phones have been organized into groups of relatively similar phones, starting from vowels. After confirming the values of sounds along attribute dimensions, it is possible to calculate the distances between all phones and convert them into Similarity percentages by dividing the Distances with the MaxDistance, which has been measured within the set of studied replicators (see p. 47). One challenge of this method is that Vakulenko (2022)

did not provide instructions about how to compare the values 1, 0, and *empty value* to each other in order to compare consonants and vowels to each other along the attribute-dimensions *p_{sib}*, *p_{lat}*, *p_{trill}*, *p_{eject}*, *p_{click}*, and *p_{impl}*. Due to these challenges, some minor changes to Vakulenko's model were required for Improved Lexico-statistics.

In the development of Improved Lexico-statistics, all attention was given to the similarities between the *Latin phones*, which are defined as *phones that can be represented with one single Latin letter without diacritics*. Empty attributes of these phones were given the value of -0.5 in order to highlight the difference between vowels and consonants. In addition, all dimensions were given weights that are shown in Table 17.

Table 17: Weights of the phonetic dimensions of the IPA alphabet

Dimension	Abbreviation	Weight
Horizontal position	p _h	12
Vertical closure	p _v	4
Roundness	p _r	4
Voicing	p _{voice}	3
Nasality	p _{nasal}	2
Retroflex feature	p _{ret}	0
Homogeneity	p _{hom}	3
Sibilant feature	p _{sib}	3
Laterality	p _{lat}	3
Trill feature	p _{trill}	3
Continuation feature	p _{cont}	3
Pulmonic feature	p _{pul}	0
Ejective feature	p _{eject}	0
Click feature	p _{click}	0
Implosive feature	p _{impl}	0

The *Manhattan Taxi* method was used for calculating the Distances (see p. 47). The weights were set to zero for those dimensions along which there was no variation among the Latin phones. For other dimensions, the weights were set equal to the amount of alternative classes. This amount of alternative classes was inferred so that columns that contained only values 0 and 1 were concluded binary, and they were given the weight of two. Dimensions that had values 0, 1, and 2 were given the weight of three. Dimensions that contained fractions were given the weight of the divider, which was considered as the amount of possible classes. For the dimension p_h, the weight of 12 was given, although one phone contained a value that was higher than 12/12 (/w/). After calculating the Manhattan Taxi distances between the Latin phones, the *Maximum Distance* within this subset of phones was found to be 27.67 (between /p/ and /o/). Once the Maximum Distance was known, it was possible to calculate the similarities between the Latin phones with the following equation:

$$Similarity(P1,P2) = 1 - \frac{Distance(P1,P2)}{27.67}$$

Based on this equation, the highest similarity among Latin vowels is between /a/ and /ä/ (99.4%). Out of the Latin consonants, the highest Similarity appears between /c/ and /k/ (98.8%). The similarities of all Latin phones have been presented in Table 18 (p. 51).

Table 18: The Similarity percentages of Latin phones

	a	ä	o	e	i	y	u	q	c	k	g	h	x	s	t	d	z	m	n	r	l	f	v	p	b	j	w
a	100	98	84	95	93	86	82	24	31	28	39	24	39	20	20	31	31	20	35	20	35	20	31	6	17	57	6
ä	98	100	86	93	91	84	84	26	30	30	40	26	40	19	19	30	30	19	33	19	33	19	30	4	15	55	4
o	84	86	100	89	87	94	98	25	25	29	40	25	40	14	14	25	25	14	29	14	29	14	25	-	11	51	14
e	95	93	89	100	98	90	87	29	36	33	43	29	43	25	25	36	36	25	40	25	40	25	36	11	22	61	11
i	93	91	87	98	100	93	89	31	39	35	46	31	46	28	28	39	39	28	42	28	42	28	39	13	24	64	13
y	86	84	94	90	93	100	96	24	31	28	39	24	39	20	20	31	31	20	35	20	35	20	31	6	17	57	20
u	82	84	98	87	89	96	100	28	28	31	42	28	42	17	17	28	28	17	31	17	31	17	28	2	13	53	17
q	24	26	25	29	31	24	28	100	93	96	86	78	86	60	82	71	49	39	53	39	46	60	49	67	57	67	17
c	31	30	25	36	39	31	28	93	100	96	86	71	86	67	89	78	57	46	60	46	53	67	57	75	64	75	24
k	28	30	29	33	35	28	31	96	96	100	89	75	89	64	86	75	53	42	57	42	49	64	53	71	60	71	20
g	39	40	40	43	46	39	42	86	86	89	100	64	78	53	75	86	64	53	67	53	60	53	64	60	71	82	31
h	24	26	25	29	31	24	28	78	71	75	64	100	86	60	60	49	49	39	53	39	46	60	49	46	35	67	17
x	39	40	40	43	46	39	42	86	86	89	78	86	100	75	75	64	64	53	67	53	60	75	64	60	49	82	31
s	20	19	14	25	28	20	17	60	67	64	53	60	75	100	78	67	89	57	71	57	64	78	67	64	53	64	35
t	20	19	14	25	28	20	17	82	89	86	75	60	75	78	100	89	67	57	71	57	64	78	67	86	75	64	35
d	31	30	25	36	39	31	28	71	78	75	86	49	64	67	89	100	78	67	82	67	75	67	78	75	86	75	46
z	31	30	25	36	39	31	28	49	57	53	64	49	64	89	67	78	100	67	82	67	75	67	78	53	64	75	46
m	20	19	14	25	28	20	17	39	46	42	53	39	53	57	57	67	67	100	86	57	64	78	89	71	82	64	64
n	35	33	29	40	42	35	31	53	60	57	67	53	67	71	71	82	82	86	100	71	78	71	82	57	67	78	49
r	20	19	14	25	28	20	17	39	46	42	53	39	53	57	57	67	67	57	71	100	64	57	67	42	53	64	35
l	35	33	29	40	42	35	31	46	53	49	60	46	60	64	64	75	75	64	78	64	100	64	75	49	60	78	49
f	20	19	14	25	28	20	17	60	67	64	53	60	75	78	78	67	67	78	71	57	64	100	89	86	75	64	57
v	31	30	25	36	39	31	28	49	57	53	64	49	64	67	67	78	78	89	82	67	75	89	100	75	86	75	67
p	6	4	-	11	13	6	2	67	75	71	60	46	60	64	86	75	53	71	57	42	49	86	75	100	89	49	49
b	17	15	11	22	24	17	13	57	64	60	71	35	49	53	75	86	64	82	67	53	60	75	86	89	100	60	60
j	57	55	51	61	64	57	53	67	75	71	82	67	82	64	64	75	75	64	78	64	78	64	75	49	60	100	49
w	6	4	14	11	13	20	17	17	24	20	31	17	31	35	35	46	46	64	49	35	49	57	67	49	60	49	100

Calculating the similarity of two words based on Variation Rules

Once the similarities of phones are known, it is possible to use them and the method presented in chapter 2.2 for calculating the similarity of two spoken words or phonetically written words that share a similar sequence. This method, however, does not yet cover for all cases. For example, it cannot be used for calculating the phonetic similarity of the spoken Spanish words /caro/ and /carro/ as Table 18 does not contain the similarity for /rr/ and /r/. In addition, it does not suit situations

in which some additional phones or phonetic characters are inserted into the structure of Word1 in order to convert it to Word2. Due to this, a Variation Rule based approach was selected as the basis of Improved Lexico-statistics. Table 19 (p. 85) lists a set of Variation Rules that can be used for converting word W1 to W2 (or vice versa) and the related Variation Step Lengths. In these rules, the term *character* is used as a synonym of *phone* or *phonetic character*. After these rules have been applied to close the gap between W1 and W2, the similarity is calculated by subtracting from one the total route length divided by ten.

Table 19: List of Variation Rules for altering word W1 into W2

#	Type	Rule and example	Variation step length (VSL)	Similarity(W1,W2)
1	General dissimilation	Substitute a character with an alternative representation of the same phone: Pharaoh → Faraoh	f/ph (0), z/ts (0.5), bh/b (0.5), q/qu (0.5), tsh/tx (0.5)	95–100%
2	General dissimilation	Substitute one character of W1 with a phonetically similar character	See Table 20 (p. 86)	89–100%
3	Fortification	Duplicate a letter: caro → carro or vaka → vaaka	0.5	95%
4	Lenition	Convert a double consonant to a single consonant or a double vowel to a single vowel: vaaka → vaka	0.5	95%
5	Vowel assimilation	Convert a vowel into a diphthong or vice versa: Gadira → Gadeira (1)	1	90%
6	Vowel assimilation	Add into the structure of a word a vowel that already exists in it: Atlas → Atalas	1	90%
7	Vowel dissimilation	Add into the structure of a word a vowel that does not yet exist in it: Atlas → Atilas	2	80%
8	Vowel dissimilation	Remove a vowel from a word	1	90%
9	Consonant dissimilation	Convert two consonants into one consonant or one consonant into two consonants (without creating a sequence of three consonants): septem → setem	2	80%
10	Consonant dissimilation	Add into the structure of a word a consonant in between two vowels or a consonant that would create a sequence of 3 or more consonants. Gadeir → Gadepir	4	60%
11	Morphological	Add or remove a prefix or suffix: Gadeir → Gadeirus	0	100%
12	Morphological	Extend a word by adding a character to its end or beginning, or remove a character from the end or beginning of a word that has at least 3 characters: Gadir → Agadir	1	90%
13	Morphological	Add several characters to the end of a word that has at least 4 characters (cannot be combined with other morphological rules): Gadeir → Gadeiraya	2	80%
14	Morphological	Add or remove a component: Sakir-Har → Sakir	2	80%

The general dissimilation rule 3 is founded on the different traditions of writing certain phones like /f/ and /z/. The dissimilation rule 2 is based on the calculated similarities of *Latin phones* (see p. 84). The fortification and lenition rules 3–4 are based on the idea that double consonants and double vowels are the same *Latin phone* as the single consonant,

but the duration is just longer. The assimilation rule 5 is based on the similarity between vowel phones with those diphthong phonemes that contain this same vowel. The assimilation rule 6 is based on the way in which an already existing vowel helps the assimilation of the same character into the word without problems (e.g. Atlas → Atalas). The vowel

dissimilation rules 7–8 have a lower weight than the consonant dissimilation rules 9–10, as vowels tend to ease the pronunciation of a word instead of making it more difficult. The morphological rules add material to a word without challenging its integrity, or remove some relatively insignificant parts or letters. Therefore, these changes have a relatively short Variation Step Length, although several letters may be added or removed.

If several rules apply, then the rule (or set of rules) with the shortest *Route Length* should be used. For example, the adding of 3 letters to the end of a word can be done by applying rule #15 or by applying rule #16 for three times. In this case, the Route Length for rule #15 is only two; therefore, it should be used. If the words W1 and W2 already exist, then their Route Length is the shortest route that can be travelled from W1 to W2 or from W2 to W1. The shortest Route Length will also determine Similarity(W1,W2), which means that these Variation Rules can be used for measuring the similarity of two words that have been claimed as potential cognates based on their similarity of form and meaning.

The rules can be applied also to shorter and longer words, but in such cases, the Variation Step Lengths may have to be altered so that the application of a rule to a short word would have a bigger impact on Similarity than the application of the same rule to a longer word. The Variation Step Lengths and Similarities concerning rule 2 of Table 19 have been summarized to Table 20.

Calibrating the model to fit the comparison of spoken words

According to Improved Lexico-statistics, the similarity of two spoken words W1 and W2 is inversely proportional to the probability of W1 being converted into W2 in a laboratory test, in which the test subject is asked to repeat the spoken word W1. If mutations from W1 to W2 are common, these words are very similar, and if they occur hardly ever, the W1 and W2 are very different. This test arrangement will make it possible to test, whether the Variation Rules have produced Similarity percentages that appear in the same order

as the similarities measured in the laboratory test. This test can be extended to have a higher resemblance with cultural evolution by adding a longer chain of test subjects, who each repeat the word to the next test subject in the chain.

Table 20: Variation Rules for substituting Latin phones and characters with each other

#	C1	C2	Variation Step Length (from C1 to C2 or from C2 to C1)	Similarity
1	/a/	/ä/	0.2	98%
2	/a/	/e/	0.5	95%
3	/a/	/y/	1.4	86%
4	/e/	/i/	0.2	98%
5	/e/	/y/	1	90%
6	/i/	/y/	0.7	93%
7	/o/	/e/	1.1	89%
8	/ä/	/e/	0.7	93%
9	/ä/	/o/	1.4	86%
10	/b/	/d/	1.4	86%
11	/b/	/p/	1.1	89%
12	/b/	/v/	1.4	86%
13	/c/	/g/	1.4	86%
14	/c/	/k/	0.4	96%
15	/c/	/q/	0.7	93%
16	/c/	/t/	1.1	89%
17	/c/	/x/	1.4	86%
18	/d/	/g/	1.4	86%
19	/d/	/t/	1.1	89%
20	/d/	/b/	1.4	86%
21	/f/	/v/	1.1	89%
22	/f/	/p/	1.4	86%
23	/g/	/q/	1.4	86%
24	/g/	/c/	1.4	86%
25	/g/	/k/	1.1	89%
26	/k/	/q/	0.4	96%
27	/k/	/x/	1.1	89%
28	/m/	/n/	1.4	86%
29	/p/	/t/	1.4	86%
30	/q/	/k/	1.4	86%
31	/q/	/x/	1.1	89%
32	/s/	/z/	1.1	89%

Calibrating the model to fit the comparison of two written words

According to Improved Lexico-statistics, the similarity of two written words W1 and W2 is inversely proportional to the probability of W1 being converted into W2 in a laboratory test, in which W1 is read aloud by one test subject to another test subject, who then writes it down as W2. For example, if someone reads the name “Kevin”, it is possible that the other person writes it down as “Kebin”. The mutation may occur either at the point

when X reads “Kevin” as /kebin/ or at the point when Y writes down /kevin/ as “Kebin”. This means that laboratory tests can be arranged for measuring the similarities of a set of similar words with an ordinal scale: The higher the frequency of a mutation from W1 to W2, the higher the similarity between W1 and W2. If such mutations do not occur, the similarity is relatively low. This method can be used for measuring, to what extent people use Latin letters as phonetic characters in order to represent the words that they hear. In addition, it can be used for testing the applicability of the Variation Rules to written words. The hypothesis of Improved Lexico-statistics is that people do treat Latin letters as phonetic characters when writing names or unknown words of unknown languages.

Another method for calibrating the model for the measurement of similarities between written words would be data mining the Internet in order to see, which misspellings are more common than others are. A third method would be to compare the Variation Rule based similarities with the way in which Internet search engines interpret similarity. If the search engines recognize the mutated variant of a word as synonymous to the correct word, then the distance that was caused by the Variation Rule is small. For example, according to Google, *Kebin Kostner* is almost the same as *Kevin Costner*, as the search with “Kebin Kostner” will produce a list of links that refer to Kevin Costner. However, such a similarity does not exist between *Kerin Kostner* and *Kevin Costner*. This indicates that the *graphemic distance* between *v* and *b* is equally small as the distance between /v/ and /b/. In addition, it indicates that the graphemic distance between *v* and *r* is relatively big and analogical to the distance between /v/ and /r/. In a similar fashion, Google will show a list of links to *Frank Zappa*, if “*Frank Tsappa*” is used as the search term whereas the usage of “*Frank Kappa*” as a search term will not lead to *Frank Zappa* in the same manner. This indicates that the graphemic distance between *z* and *ts* is smaller than the distance between *z* and *k*. These preliminary findings support the idea that people tend to write names and unknown words of unknown languages

with phonetic writing, using the Latin letters as equivalents of the Latin IPA phones.

3.6 Using improved Variation Rules for finding the roots of an opaque name

According to the DH theory, a single focal name can be extended into a *Name Family* (see p. 61) which will contain names that are similar to the name and which yet appear in some region within the geographic scope of the study (see p. 161). If the focal name and its variants are long enough, chance resemblance is unlikely. This means that all the names of the name family are potential cognates that may have originated from the same urform or root. After this, the urheimat of this name family can be investigated, based on the incidence of each member of the family in different geographical regions. If most members of the name family are still during modern times most common in some specific region as anthroponyms or place names, this region is a likely candidate for the urheimat of the name family. Once the potential urheimat of a name family is known, it is possible to locate the studied opaque name in the context of some specific languages, and start searching for its potential meanings.

Let us take as an example the opaque name *Gadeirus*, which was studied as part of the names study in chapter 5.12. This name first was extended into a *Name Family* by defining that maximum permitted Route Length of the applied Variation Rules would be 2.1, which means that the generated variants should all have at least 79% similarity with *Gadeirus*. The applied Variation Rules were taken from Table 19 and Table 20. First, a zero distance variant was created by removing the Latin suffix < -us >, which was commonly added to opaque foreign names when they were written in the Latin form. After this, the remaining base name *Gadeir* was truncated to *Gadei* (distance=1), to *Gade* (distance=2), and to *Gdr* (distance=2), which all have empirical counterparts as anthroponyms. In addition, short endings were added to the base name *Gadeir* and *Gadei*, in order to generate names like *Gadeira*, *Gadeire*, *Gadeiro* (distance=1), and *Gadeia* (distance=2), or longer endings that will lead

to names like Gadeiray, Gadeiraya, and Gadeyrayasate (distance=2). All these extended names have empirical counterparts in certain regions, as can be seen by following the underlined hyperlinks that are connected to the generated words. In addition to the generation of these variants, also the following names, which all have empirical counterparts, were added to the name family (distances given in parentheses after each variant): Kadeir (1.1), Kadir (2.1) Kadei (2.1), Kadeira (2.1), Kadeiri (2.1), Kadeiro (2.1), Kadeiry (2.1), Quadeir (1.9), Qadeir (1.4), Gadir (1), Gader (1), Gadira (2), Gadiri (2), Gateira (2.1). The following existing names, for example, were not included into the Gadeirus name family as their distance was more than 2.1: Cadeira (2.4), Cadir (2.4), and Gateiray (3.1).

The geographic distribution of all anthroponyms of the Gadeirus Name Family is shown below in Appendix table 6 (p. 230). India appears as the Mode region in 14 cases, and as the region of the 2nd highest incidence in four cases. This is marked to the Totals row with the annotation 14.4. This high figure suggests that the urheimat of the Gadeirus Name Family might have been in India. West Africa is the second (5.3) and the neighboring regions of India are the third and fourth on the list: *Sundaland* (4.4), and *Gedrosia* (3.3).⁷⁷ The validity of the Variation Rules is supported also by the relatively high correlation between the instance of the names of the Gadeirus Name Family in India and in West Africa, so that those names that have their mode value in India often have their second highest incidence in West Africa, or vice versa. This correlation suggests that the used variation rules are a relatively good model of the random mutations that occur when the names are replicated from region to another or from one generation to the next one.

Based on this preliminary urheimat analysis, it was possible to shift the search of the root of the name *Gadeirus* to the languages that have been spoken in the Indus Valley and India. Without an urheimat

analysis based on Variation Rules, there would have been a high risk that a scholar of etymology would have focused too much at the Mediterranean Region where names like *Gadeira*, *Gadara*, and *Gedera* have been known to exist during the Phoenician period.

In the *Brahui* language, the word *gade/ged* means “Room” or “House”, and *Gedrosia* and *Gadrosia*, mean “Land of houses”.⁷⁸ The *Brahui* language is a Dravidian language that is spoken in the northwestern part of the Indus Valley, at the vicinity of the ancient city of Mehrgarh, which was built around 7000 BCE. Based on this linguistic and historical context, we may draw the hypothesis, according to which one root of the name *Gadeirus* is *gade*, meaning a “House that has only one room”. Such houses were built in the city of Mehrgarh. Another potential root is the name *Gadar*, which may have initially meant “Ruler”, as the verb *gadara* in the Arabic language still means, “To rule”. However, also the name *Gadar* may also be a derivative of the roots *gad* and *gade*. Figure 9 (p. 89) shows the genealogical network, via which the names *Gadeir* and *Gadeirus* seem to have received their meaning. The figure matches with DH theory, according to which many memes and memplexes have inherited their form or meaning from several parent memplexes. Based on the table, the name *Gadar* is most common in India, and West Africa is the area of second highest appearance. According to chapter 4.5, there have been notable migrations from India to West Africa, and therefore, the West African names *Gadeire*, *Gadiri*, and *Kadei* have most likely inherited their form (and meaning) from the Indian Subcontinent. The existence of *Gadeira* as a place name in ancient Iberia can be explained by the Phoenician tradition, according to which cities and islands, which originally existed at the coasts of the Indian Ocean where later on re-founded at the vicinity of the Mediterranean Sea. Although these cities and places might have been founded with the additional element “New” in front of the name (e.g. *New Gadeira*), it is logical that

⁷⁷ Sundaland = Indonesia, Malaysia, Papua New Guinea, and the Philippines; Gedrosia = Iran, Pakistan, Afghanistan, and Tajikistan (see p. 26).

⁷⁸ The meanings of these words have been provided by Dr. Muhammad A. Brohi who is a native *Brahui* speaker.

such additional elements would have been dropped out after some centuries. This reduction would have occurred especially if there would no longer have been knowledge of the existence of the older and more authentic namesake (e.g. *Gade*, *Gadeira*, or *Gedrosia*).

Although one likely root for *Gadeir*, *Gadeirus*, and *Gadeira* seems to be *ged* / *gad* (house with one room), it is possible that some of the listed variants

of the Gadeirus Name Family would have been born independently in parallel at separate regions (chance resemblance). Yet, there is a connection from India to the Mediterranean Sea via Bahrain and via the Phoenician culture (chapter 4.7), and this connection could explain the appearance of the Gadeirus name family in Iberia and Latin America.

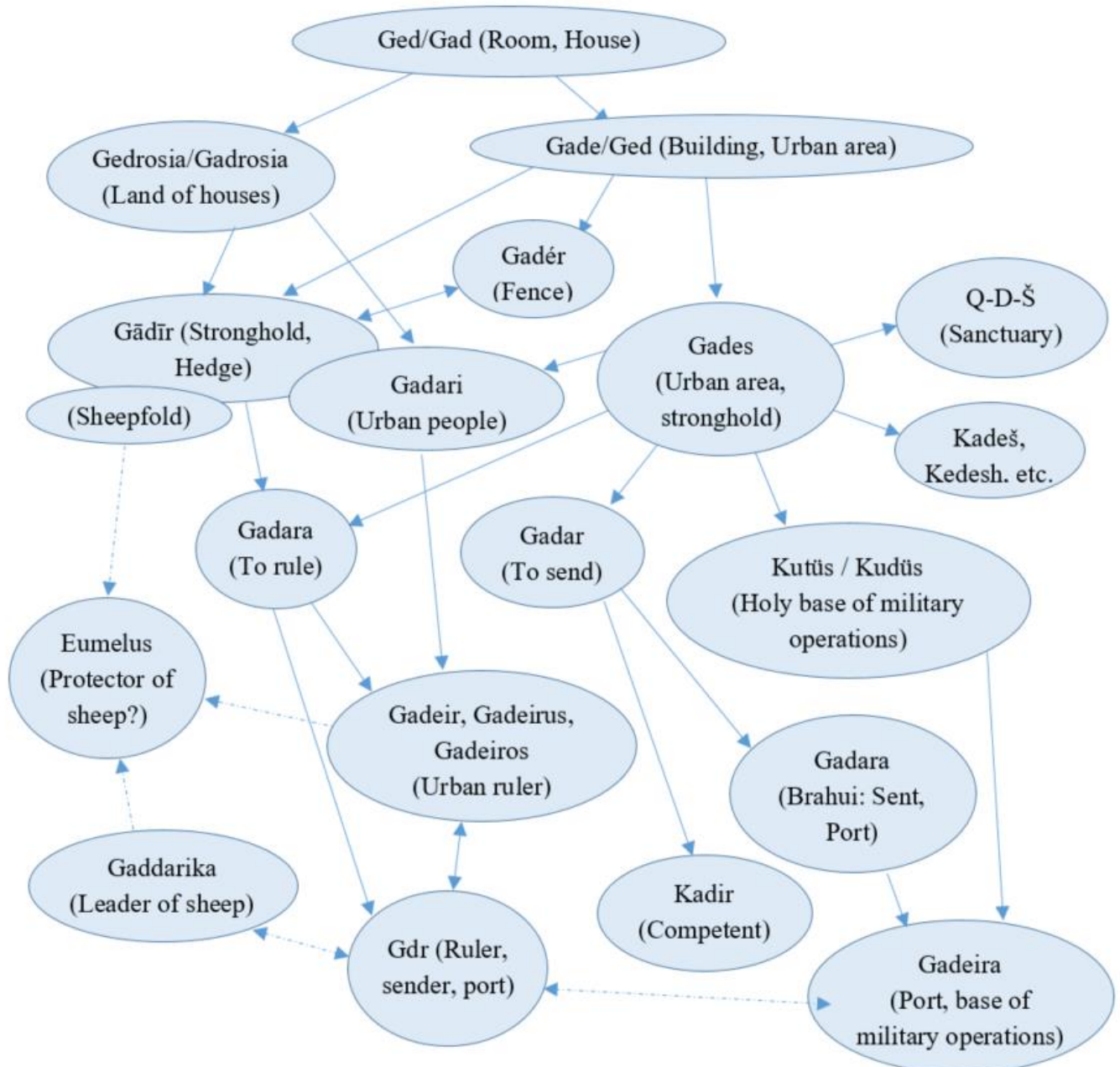


Figure 9: Potential roots of the name Gadeirus

3.7 Improved Glottochronology

The purpose of *glottochronology* is to estimate the divergence time of two languages from each other based on their calculated lexical similarity (see 2.6p. 67). Before taking the task of improving glottochronology, it is necessary to analyze the meaning of divergence, as divergence may occur also in cases that do not fit the paradigm of the language tree model. According to the language tree model of comparative linguistics, the divergence of a language into two languages occurs when the speakers of the language are separated from each other, and as a result, two new languages are formed. The language tree model assumes that all languages have just one parent language, from which they inherited their relevant or essential form. If languages have adopted words from several other languages, these adopted words are considered loan words, and are therefore not considered part of the relevant or essential part of the language. In comparative linguistics, similar languages are classified into language families, which appear as the branches of the language tree. If a language cannot be located into the same language tree (language family) with some other languages, then this language is classified as *language isolate*. According to the language tree model, divergence of languages occurs **only** in the case, in which two languages are born from one parent language. This model fails to capture those cases in which a language is born from several parent languages. Three such situations are presented below.

1) Approximately half of the vocabulary of the Minoan language originates from Proto-Uralic, and the other half from Proto-Indo-European (Revesz 2019). In other words, the Minoan language seems to have been born as the result of the merging of proto-Uralic and proto-Indo-European, supposedly at the island of Crete. This means that the Minoan language started to diverge from proto-Uralic and from Proto-Indo-European languages as soon as the major immigration waves of Proto-Uralic speakers and Proto-Indo-European speakers to Crete ended. If the Minoan language is classified as a Proto-Indo-European language, then it started to diverge from Proto-Uralic language when it lost contact to the

Proto-Uralic speakers. This divergence would have occurred although the Minoan language was not part of the Uralic language family according to the language tree model.

2) According to Revesz (2019), approximately half of the vocabulary of the Sumerian language, which existed in two distinct dialects, was inherited from Proto-Uralic and the other half from Proto-Tamil. If we assume that the migration of the Proto-Uralic speakers and Proto-Tamil speakers to the Sumerian region ended year Y, then we can conclude, that the Sumerian language would have started to diverge from Proto-Uralic and Proto-Tamil around year Y.

3) In Nicaragua, dozens of home-sign systems, which are simple languages, merged into the Nicaraguan Sign Language (Shepard-Kegel 2018). After the birth of this language, it would have started to diverge from its parent languages.

These examples show that the divergence of two or more languages can occur even if the languages did not originally belong to the same language family. This conclusion is also an anomaly for the method of Bayesian Phylogenetic Inference, in which lexical similarity is used for calculating alternative language trees, and then the most likely language tree is selected based on linguistic expert knowledge (see Maurits et al 2019 and Green 2015).

Calculating the divergence time of two languages with Improved Glottochronology

According to Improved Glottochronology, the time (T) of the divergence of two languages can be calculated with the following equation, which has been derived from the equations presented on pages 67–27.

$$T = \frac{\ln\left(\frac{\text{Similarity}_{\text{later}}}{\text{Similarity}_{\text{initial}}}\right)}{-2 * \ln(r)}$$

In this equation, the divergence time *T* means millenniums before the *later moment*, when the later similarity of two languages was measured. Similarity_{initial} is the initial similarity of the compared languages. The measurement of Similarity_{later} can be done based on the principles of *Improved Lexico-statistics* (see chapter 3.4 and 3.5). The constant *r* in the equation is the percentage of

words that in general are replaced or completely mutated in a millennium. In the normal and simple case, $\text{Similarity}_{\text{initial}}$ is 100%, and therefore the equation can be simplified to the normal glottochronological equation.

$$T = \frac{\ln(\text{Similarity}_{\text{later}})}{-2 * \ln(r)}$$

In the more complicated cases, the two languages that started to diverge had a similarity that was at the range from 0% to 100%. For example, if the Proto-Uralic language and Proto-Indo-European language had mixed to each other in the island of Crete producing the Minoan language, then the initial similarity between Proto-Uralic and Minoan would have been approximately 50%. Later on, the similarity between the later versions of the Minoan language would have had a declining similarity with the successor languages of Proto-Uralic languages.

Tuning up the model

If the task is to study the divergence time of two languages $L1_{\text{later}}$ and $L2_{\text{later}}$ based on the similarity of these two languages during current times, it is useful to measure the genetic similarity of the speakers of these languages. If there is strong genetic similarity, then it is likely that both languages and speaker populations originated from one ancient urform and population. This ancient language would then have diverged into two or more languages in the way that matches the genealogical tree paradigm. However, if the studied two languages are relatively similar and the speaker populations are genetically relatively different, then it is likelier that the similarities would have been caused by migrations of small but influential minorities, which would have left a clear linguistic mark to the language that was spoken at the place where they migrated. Yet, due to their small numbers, they would have left only a small genetic trace. This suggests that the original similarity of the $L1_{\text{initial}}$ and $L2_{\text{initial}}$ would have been only about 50% or less. In addition, it may be possible to deduce some cultural traits of the influential immigrants by the vocabulary that they brought to the region along with themselves. For example, if the adopted vocabulary contains words like *bronze*, *blacksmith*,

king, and *sailing*, it is possible that bronze would have been introduced to the region by an influential immigrant group that sailed to the region from a far-away place.

If it is uncertain, what the similarity of two languages was when they started to diverge, the similarity can be given as a range. That would then produce a range of likely divergence times T1–T2. Likewise, if we know that the divergence must have occurred within T1–T2, it is possible to calculate the initial similarity of the languages at the time when divergence started.

In addition, it is possible to take into account in the model that violent conquests and the following times of potential ethnic cleansings tend to cause the conquered population to lose about 50% of their vocabulary in just one hundred years, if it is not able to escape the conquest. After taking this into account, the remaining parts of the time scale could be analyzed with the r of the “normal times”, and this r could be lowered from 81% to 75%. Even if there is no genetic, archaeological, or historical knowledge of such conquests, it may be worth using a higher than normal r for years 4000 – 2000 BP, as during these millennia the diffusion of languages was faster than normal, according to Wichmann (2023).

3.8 Recalculating the similarity of Basque and the Dravidian languages

The purpose of this chapter is to review and recalculate the “over 50% similarity” that Lahovary (1963, 374) reported between the Basque language and the Dravidian language family. The background to this study is the fact that Lahovary studied law and philosophy in the University of Paris. Anthropology and linguistics were only a hobby for him. This means that Lahovary’s data, findings, and conclusions need to be reviewed carefully before relying on them.

Lahovary tried to show that the Basque and the Dravidian languages have descended from a joint ancestral proto-language. Yet, it is also possible that the similarities of words are caused by chance resemblance or that the words have been loaned

from the Dravidian languages to Basque much later than the years 6000–3000 BCE when a potential ancestral language might have existed.

Fixing the problems of Lahovary's data

Lahovary reported an approximate 50% similarity between Basque and the Dravidian, and told that he would soon publish an article that would explain how he reached this similarity percentage (Lahovary 1963, p. 374). Yet, such an article was never published. Instead, Lahovary needed to defend in his later article the way in which he had identified potential cognates in his 1963 book.⁷⁹ Due to this, the only list of potential cognates can be derived from Lahovary 1963. The resulting list of potential cognates is shown in Appendix table 67 (p. 280).

Although Lahovary refers to lexico-statistics, his comparison was not properly made between two languages: He compared to each other the Basque language and the Dravidian language group. This means that he identified and calculated a potential cognate every time when at least one of the Dravidian languages contained a similar word with Basque. This is an incorrect method, as in lexico-statistics the comparison should be made between two languages, not between a language and a language group. For example, it would have been correct to compare to each other Basque and Kannada, but not Basque and Dravidian languages. In order to fix this problem, Lahovary's data was disaggregated to the level of specific languages, which could then be compared to Basque (Appendix table 67, p. 280). The highest amount of potential cognates was found between Basque and Kannada and between Basque and Tamil. In general, the Dravidian languages of Southern India had much more similar words with Basque than the Dravidian languages of Northern India.

A third problem with Lahovary's data is that approximately 45% of the Basque words that he listed in his book (1963), are not found within *Hiztegia Elhuyar*, which is a contemporary dictionary of Basque words. Due to this, the 50% similarity between Basque and the entire group of the Dravidian languages should possibly be reduced to 50% times 45%, which is 22.5%. In addition, this similarity percentage should be disaggregated to the level of individual languages.

The fourth problem of Lahovary's study is common to all lexicostatistical studies: Different scholars tend to reach different conclusions concerning the Similarity of two words based on their own intuition and linguistic experience. This problem was resolved by reviewing all similar words that Lahovary had identified. In this review, the similarity of form was calculated with the Variation Rule based method (p. 85–86) and the similarity of meaning was measured with Chat GTP (see p. 80). After this, the total Similarity of each word-pair was calculated by multiplying the Similarity of form by the Similarity of meaning. Finally, the Similarity percentages were summed up and divided by the amount of studied words. This method is more transparent and reproducible than the intuitive expert knowledge based method that Lahovary used. In addition, it is more critical and conservative, as the word-pairs of lower Similarity were given less weight than the word-pairs of higher similarity. The lexical similarities that were identified by Lahovary between Basque and Kannada are shown in Table 21 (p. 93). The table shows the similarities in declining order of Similarity. Non-confirmed word-pairs have been marked with “n.c.”

⁷⁹ In his article, “Basque, Dravidien et Caucasiens” (Lahovary 1963b), Lahovary defended his book that had been published

earlier in the same year, but did not summarize the research data that was based on the Swadesh list of 200 words.

Table 21: Quantitative similarity of the Kannada–Basque word-pairs mentioned in Lahovary 1963

Word in Kannada	Meaning	Basque word	Meaning	Similarity of form (%)	Similarity of meaning (%)	Similarity Percentage
mugul	flower bud	mugil (n.c.)	flower bud	95 %	100 %	95 %
ola	inside	ola (n.c.)	cabin, hut	100 %	90 %	90 %
buti	man servant	botoi (n.c.)	man servant	89 %	100 %	89 %
amma	female	ama	mother	95 %	90 %	86 %
bhala	forehead, brow	belar (n.c.)	forehead	83 %	100 %	83 %
kebi	cave, hollow	koba	nest, hollow	91 %	90 %	82 %
gol	throat	golo	goiter	90 %	90 %	81 %
konku	something bent, rounded	konkur(n.c.)	roundness	90 %	90 %	81 %
turu, tura-i	drizzle, to gush forth	t-turri , iter, tur (n.c.)	spring, fountain	90 %	90 %	81 %
gubbi	hump	gupi (n.c.)	deformed spine	90 %	90 %	81 %
appu	to embrace	apa, apatz	kiss	86 %	90 %	77 %
mugu	face	musu	face	77 %	100 %	77 %
muti	face	mutur, mustur	snout	85 %	90 %	76 %
eru	dung	errai (n.c.)	dung	76 %	100 %	76 %
ba	mouth	abo (n.c.)	mouth	74 %	100 %	74 %
kappu	meat	kaba(l)	domestic animal	81 %	90 %	72 %
sindu	bad smell	sund-da	stink	81 %	90 %	72 %
sala	to enter	salazar (n.c.)	country house	80 %	90 %	72 %
bar	stream, to flow	ibar	river valley	90 %	80 %	72 %
musu	to smell	mutur, mustur	snout	79 %	80 %	63 %
gadda	chin	ganga	mouth	70 %	90 %	63 %
alasu	exhausted	lazu (n.c.)	weak man	85 %	70 %	59 %
hikku	heart	biho(tz)	heart	59 %	100 %	59 %
unmu	birth	ume	child	74 %	80 %	59 %
karata	skull, coconut	garaun (n.c.)	skull, brain	55 %	100 %	55 %
usir	breath	usna (n.c.)	smell	67 %	80 %	54 %
pal	milk	galatz	milk	50 %	100 %	50 %
ana	breath	arnasa	respiration	60 %	80 %	48 %
begu	to spy	behatu	to observe	52 %	90 %	47 %
Sum of similarities						2078%

If we assume that Lahovary had studied 200 words to find these 29 similar words,⁸⁰ then the similarity of Basque and Kannada would be 2078% divided by 200, which is 10.4%. However, if we assume that 45% of the words that Lahovary discovered would have been errors, then a more conservative estimate for similarity would be 4.7%. Based on

these assumptions, the Similarity (Basque, Kannada) would be 4.7–10.4%. The table below shows the Similarity of each specific Dravidian language with Basque based on the same assumptions. The results of Tovar (1961, 259) concerning the similarity of Basque with some other languages have been given as benchmarks.

⁸⁰ The size of the Lexicostatistical sample was usually 200 in the 1960's.

Table 22: Similarities between Basque and some other languages based on Towar 1961 and Lahovary 1963

Language	Location of most speakers	Similarity (lower)	Similarity (higher)
Kannada	Southwest India	6.5 %	14.5 %
South Berber	Northwestern Africa	7.4 %	10.9 %
Tamil	Southeast India	4.9 %	10.8 %
Riffian Berber	Northwestern Africa	6.0 %	9.7 %
Georgian	Caucasus	4.7 %	7.5 %
Arabic	Arabia	3.7 %	4.9 %
Telugu	Southern India	1.9 %	4.2 %
Malayam	Southern India	1.8 %	4.0 %
Egyptian	Egypt	2.3 %	3.4 %
Tulu	Southwest India	1.6 %	3.5 %
Malto	Eastern India and Bangladesh	1.0 %	2.3 %
Brahui	Western Pakistan and Eastern Iran	0.7 %	1.6 %
Kui	Eastern India	0.3 %	0.7 %
Gondi	Central India	0.3 %	0.6 %

What is remarkable in this table is that all the languages that are currently spoken in southern India (green highlight) have higher Similarity figures than the other Dravidian languages (gray highlight). This is evidence against descent from a joint ancestral proto-language, which would have been located somewhere between Anatolia, Urals, and Eastern Iran. The higher similarity of the southern Dravidian languages suggests a maritime contact between Iberia and India at a much later stage. According to this interpretation, the similar words would be loan words instead of being cognates that would have descended from a shared ancestral proto-language.

Another observation is the much higher similarity of Kannada and Tamil with Basque, compared to the other Dravidian languages. This suggests that the loan words would have been loaned to Proto-Basque from Proto-Tamil-Kannada. According to Krishnamurti (2003, 21), the Proto-Tamil-Kannada language was born around 1500 BCE, and it diverged into Tamil and Kannada approximately 500 BCE. Therefore, the high level of similarity of

Basque with Tamil and Kannada and the relatively low level of similarity with other Dravidian languages could be explained by the heavy contact of Proto-Basque speakers with Proto-Tamil-Kannada speakers 1500–500 BCE. In this scenario, the contact between Proto-Tamil-Kannada and Proto-Basque would have started no earlier than 1500 BCE, and the contact would have been lost no later than 500 BCE.

The migration of Proto-Tamil-Kannada speakers to Iberia 1500–500 BCE matches with Philostratus according to whom the Indians founded 60 cities to Sub-Saharan Africa 1550–1070 BCE (see p. 111). In addition, the period 1500–500 BCE matches with the GAHAH data that indicates migrations from the Indian Ocean to Namibia ~850 BCE and to Morocco and Iberia 710–542 BCE (see p. 118). In addition, it matches with Cantarino (1981), according to whom the Basque language arrived to Iberia approximately 1500 BCE. In order to validate the results concerning the relatively high similarity between the Basque and the Tamil-Kannada group of languages, additional studies would be needed. In

addition, it would be interesting to see, whether also Berber languages would share the same words that seem to connect Basque, Kannada, and Tamil.

3.9 Summary and suggestions for further studies

Languages change when their phonetic, graphemic, morphological, or grammatical features change, or when their vocabulary changes. The vocabularies of languages consist of loan words and of the *lexicon* of the language, which consists of those words that seem authentic to the language (as opposed to loaned words). This chapter focused at the analysis of the change of the vocabularies of languages, taking as the starting point lexicostatistics and glottochronology (Swadesh 1952), Automatic Judgment of Lexical Similarity (Holman et al. 2011), and Vakulenko (2022), which contained a mathematical model for calculating the distances between the phones of the International Phonetic Alphabet. The intention was to improve these methods with the insights of the DH theory. According to Improved Lexicostatistics, the similarity of two words W1 and W2 can be measured as the product of their $\text{Similarity}_{\text{form}}$ and $\text{Similarity}_{\text{meaning}}$. The $\text{Similarity}_{\text{form}}$ can be calculated based on the total *RouteLength* that separates W1 from W2, measured as Variation Steps that need to be taken to close the gap between W1 and W2. The core of this method is the set of Variation Rules, which can be used for converting W1 to W2 or vice versa (see Table 19, p. 85). A central part of these Variation Rules is the quantitatively calculated phonetic Similarity of the IPA phonemes.

Once the similarities of the word-pairs that appear in languages L1 and L2 have been calculated, it is possible to calculate their similarity as the sum of the Similarities of the words of the lexical sample, divided by the amount of word-pairs. This method is an improvement compared to *Automatic Judgment of Lexical Similarity*, as the used rules are more nuanced compared to the two crude rules of the Levenshtein method, which is the cornerstone of Automatic Judgment of Lexical Similarity. The improvement of the rules of Automatic Judgment of

Lexical Similarity would be likely to yield very good results, as this method is already producing good results with the Levenshtein rules (Holman et al. 2011 and Wichmann 2023). It is also an improvement to the expert knowledge based identification of potential cognates, as this process is not sufficiently transparent and reproducible. Once the Similarity of two languages is known, it is possible to calculate their likely divergence date based on an Improved Glottochronology (see p. 90).

The principles of Improved Lexicostatistics and Improved Glottochronology were put to a test in two brief studies. The first one of them examined the etymology of the name *Gadeirus* based on Variation Rules and based on the geographical distribution of the variants. The name family that was created with this method contained 41 names that each had at least 80% similarity with *Gadeirus*. More than half of the names of this name family were most common or second most common in India (see p. 89). This suggested that the etymological roots of *Gadeirus* should be searched from the languages that were spoken in India or in its vicinity. The word *Gade* means a “room” or a “house with one room” in the Brahui language, and the word *Gedrosia* / *Gadrosia*, means “Land of houses” (see p. 89). In addition, the word *gadar* could have meant “ruler”, as the verb *gadara* still means, “to rule” in the Arabic language. This interpretation receives support from the name of *King Gadarat*, who ruled in Ethiopia 250 CE (see p.199). Based on these clues, the original form of the name *Gadeirus* might have been *Gadeir* and its original meaning might have been “The ruler of a land of houses”. The name *Gadeir* would have migrated to the vicinity of Gibraltar in the form of *Gadeira*, carried by Phoenician migrants who had inherited a notable part of their culture from the Indus Valley or India (see chapter 4.7). Without the usage of Improved Lexicostatistics, the etymological analysis of the name *Gadeirus* could have been too myopic, and focused only at the Mediterranean region.

The other study was the comparison of the Basque language to some Dravidian languages. The basis of this study was Lahovary (1963) who claimed that the similarity percentage of Basque language and

the Dravidian language group is over 50%. Based on a critical review of the words and concepts that Lahovary had studied 1963, the Basque language has the highest similarity with Kannada (6.5–14%) and Tamil (4.9–10.8%). Based on these similarities, and based on the relatively low similarity between Basque and the other Dravidian languages, the likeliest explanation for the similarities would have been the convergence of Proto-Basque and Proto-Tamil-Kannada in Iberia around 1500–500 BCE, followed by divergence no later than 500 BCE. In this scenario, a group of Proto-Tamil-Kannada speakers would have migrated to Iberia 1500–500 BCE, mixing with the local population in such a fashion that the Proto-Basque would have been born. This scenario matches with Philostratus according to whom the Indian king Ganges founded 60 cities to Sub-Saharan Africa, 1550–1150 BCE (see p. 111). Additional pieces of evidence that might support this hypothesis are presented in the following chapter.

Suggestions for further studies

Despite the potential insights provided by Improved Lexicostatistics and Improved Glottochronology to the origin of the Basque language, there is a great need for additional studies in order to validate or reject the hypothesis, according to which Proto-Basque would have received a large amount of loan words from Proto-Tamil-Kannada 1500–500 BCE. Suggested topics for additional studies are listed below:

1. Re-examination of the Similarity percentage between Proto-Basque and the Dravidian languages such as Kannada and Tamil based on a larger sample of words.
2. This sample should contain especially concepts that were familiar in India 1500–500 BCE, but relatively uncommon in Europe at that time. If Basque would have similar words with Kannada or Tamil in such concepts, that would be a relatively strong indication of migrations from India to Iberia at that time.
3. Empirical testing of the Variation Rules of Improved Lexicostatistics, using the proposed test settings described in page 86–86.
4. Improvement of the method of Automatic Judgment of Lexical Similarity ([Holman et al. 2011](#)) by replacing the Levenshtein rules with the rules of Improved Lexicostatistics, and then the recalculation of the similarities of the 4817 languages, which were in the database that was used by Holman et al (2008).

As the migration hypotheses relating to the migration of Dravidian words into Basque and the migration of the name Gadeirus from India to Iberia are quite extraordinary, it is necessary to devote the remaining parts of this book for the presentation and evaluation of evidence that would either support or refute such migrations.

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4 India–Africa–Europe theory

4.1 Postulation of the theory and an introduction to the method of study

According to the India–Africa–Europe theory, *long distance migrations via waterways occurred at various occasions and during various periods 3000–200 BCE*. This means that long-distance migrations were a remarkable factor in the shaping of early cultures, gene pools, and civilizations. The concept of *long distance migration* is defined here as the *migration of people, genes, or cultures at least 5000 km during less than 500 years*. The migration of a culture is defined as the *migration of a relatively large set of some typical replicators of the culture*. This means that the entire culture does not have to migrate, it is sufficient if a relatively large set of its material, performative, etched, or mental replicators migrate (see chapter 1.3). For example, if a necklace travels 5000 km via a trade network, it is not long-distance migration. However, if the custom of cultivating bananas migrates 5000 km in 500 years, that is long-distance migration.

This chapter first describes the method that was used in the literature and database study that covered the theme of the theory. After that, the India–Africa–Europe theory is elaborated with 11 hypotheses that suggest migrations from the Indian Subcontinent to Western Europe via three alternative and yet potentially complementary routes:

1. the northern route along the Caspian Sea, River Volga, and the Baltic Sea
2. the Mediterranean route
3. the route around Africa

In addition, it is possible that more than one of these routes was used either simultaneously or during different periods. The objective of this chapter is to compare to each other the credibility of each of these migration routes, and then to conclude which one would have been most likely.

Method

The study started with a rough preliminary migration hypothesis concerning the migration of Indian

cultural influence to Western Europe during the Copper Age or the Bronze Age via the Mediterranean Sea or via the sea route around Africa. This would have limited the original scope of interest to Western and Southern Europe, Middle East, India, and Africa 6000–1500 BCE. The second step of the study was to review the contents of the *GAHAH database* in order to see, how the regions of interest were connected to each other via migrations during the chronological scope of interest. The main findings at this state were the following:

1. There seemed to have been a major Migration Corridor from the British Isles and Northern Europe to the Indus Valley region via River Volga approximately 5200–50 BCE.
2. In the years 710–206 BCE these migrations would have been multiway including migrations from the Indian Subcontinent to Northwestern Europe (see p. 143).

Based on these findings, the hypothesis was reformulated so that the chronological scope was limited to 5200–38 BCE with focus on 3000–50 BCE. In addition, Northern Europe was included into the geographical scope of the study. The preliminary hypothesis of the study was formulated into the *India → British Isles hypothesis*, according to which there would have been migrations from the Indian Subcontinent to the British Isles 3000–50 BCE.

After this, Least Cost Analysis was applied to the routes between India and Britain making use of the *GAHAH* data that indicated migrations along the Baltic – Volga – Caspian Sea route. In parallel with the sketching of the alternative routes, a cross-scientific literature study was made in order to collect additional genetic, archaeological, historical, linguistic, and cultural evidence concerning the potential periods and routes of migration. After these preparations, the original ideas and preliminary theories concerning prehistoric migrations were formulated into a set of detailed hypotheses. Once the hypotheses had been clarified, the literature study was continued, and the evidence was organized so that each hypothesis was presented with a summary

of supporting evidence. In this study, evidence was discovered to support the main hypothesis of the theory (long distance migrations were relatively common) and for the 11 detailed hypotheses of the India–Africa–Europe theory. This evidence is summarized into Table 41 (p. 158). The final step of was to compare the results of the literature study with data that was obtained in an empirical study of the distribution of place names and anthroponyms (names of people). This was done in chapter 5.

Structure and content

Chapter 4.2 and 4.3 describe some key concepts and provide a more detailed description of the way in which the three main migration corridors were deduced based on LCA and GAHAH. Chapter 4.4 – 4.12 specify the detailed hypotheses that relate to the three main routes, and summarize the related evidence. In each chapter, this evidence consists of GAHAH data and other genetic evidence, and of archaeological, linguistic, historical, cultural, and onomastic evidence. Some chapters contain also references to unreliable sources such as texts written hundred years ago, non-peer-reviewed modern texts with potential nationalist motives, and to old traditions and legends. This material has been included due to the following reasons:

1. Outdated and non-peer-reviewed sources can contain valuable data and references although the related interpretations may be exaggerated due to nationalism or some other ideological reason. Yet, even the data and references that they provide should be rated as only *weak evidence* until they have been carefully reviewed.
2. Old unreliable histories, legends, and traditions have been included into the research data as the total lack of historical sources and traditions could be held as evidence against each hypothesis. Therefore, it is necessary to show that the hypothetical prehistorical event has left at least some traces into the legends, chronicles, and traditions of the studied cultures. For

example, if the old Indian, Scottish, and Irish traditions were to contain no trace of the migrations from India to the British Isles, the credibility of such migrations would be reduced to some extent.

3. The large amount and high quality of genetic, archaeological, linguistic, and historical evidence that supports a hypothesis can lead to a situation, in which the hypothesis is almost proven. In such a case, it can be used as a tool for re-interpreting old traditions and the shaky evidence that has appeared in outdated and non-peer-reviewed texts.

In order to avoid accusations of pseudoscience, the unreliable sources were given very low or zero value while evaluating the total strength of the cross-scientific evidence that supported each hypothesis.

4.2 Long-distance seafaring 5000–300 BCE

The purpose of this chapter is to give a brief introduction of the evidence that supports long distance travel along waterways already during the Copper Age and Bronze Age at the waterways that connected the Indian Ocean and the Mediterranean Sea to the North Sea. Without such evidence, it would be too easy to claim that the early genetic admixture events between distant locations would have been data errors or coincidences.⁸¹ The need for such evidence is even more imperative because long-distance migrations, as an archaeological explanation, were out of fashion among archaeologists during the second half of the 20th century.⁸²

The earliest boats that were made of one trunk of a tree have been discovered in Holland and Denmark (dated to 7000 BCE)⁸³ and in West Africa (dated to 6500 BCE).⁸⁴ Yet, much earlier boats are likely, as the earliest fishing nets have been dated to 27,000–

⁸¹ In archaeology, the majority of archaeologists of the end of the 20th century believed that long-distance migrations would have been very rare in prehistoric times (e.g. Zelinsky 1971). After 1990, however, more interest has been given to the theories of migration in archaeology (e.g. Anthony 1990)

⁸² For the critics of diffusionism and the effect of migrations, see Zelinsky (1971), and for the slow revival of the migration paradigm, see Anthony (1990).

⁸³ Carpenter (2023)

⁸⁴ Garba (1996)

21,000 BCE.⁸⁵ These early boats would have already been valuable vehicles for continental waterways, which connected, for example, the Baltic Sea and the Caspian Sea. The earliest evidence of seafaring vessels dates to the fifth millennium BCE, when reed boats that were covered with bitumen were actively used to transport Ubaid pottery from Mesopotamia to the southern side of the Persian Gulf, as far as 1000 km from Mesopotamia (Carter 2006). Some pottery that was discovered by Carter and his group even contained an image of a vessel with two masts. The appearance of the first images of sailing boats matches with the earliest appearances of cotton fabric. According to Moulherat et al. (2002), fibers from a cotton fabric have been discovered in Mehrgarh (Pakistan), dating approximately to 5000 BCE.

Bronze Age seafaring

In India, the Indus Valley civilization developed capacity for long distance seafaring around 3000 BCE (Rao 1985, 27–29). This could be possibly reflected in the Vedic texts that mention *a hundred-oared wooden boat* [Rigveda 1.116.5]. Additional information of early Indian expeditions to East Africa is presented in Chapter 4.5.

In Egypt, the first sailing ships have been dated to 3500 BCE (Hornell 2015) and the first evidence of plank-built boats is from Egypt 2600 BCE (Carter 2023). The blanks of these boats were sewn together with strings and wires. In some cultures, the bottom of the boat was made of one single log, and additional planks were sewn to it in order to raise the sides. In Europe, boats enabled people to travel long distances already around 4000 BCE, as is shown by the migration of the Neolithic farmers towards Britain from Anatolia. According to Cassidy et al. (2015), the Neolithic farmers most likely arrived to Britain from the Mediterranean Sea using the route around Iberia, as some Neolithic people of Britain had Iberian and Mediterranean genetic markers. Although these migrations could have been gradual,

advancing from the Mediterranean region to Britain over hundreds of years, there is evidence of faster and more direct migrations and trade routes from the third millennium BCE, indicating the usage of sailing boats (see Sheridan 2012). According to Schumacher (2017), a large archaeological industry of ivory artefacts existed in Iberia 3000–2000 BCE. About half of this industry used Asian ivory, which would have been shipped from Syria or India to Iberia, and the other half arrived from Africa. In addition, Mediterranean strawberry trees seem to have been intentionally planted to the vicinity of mines when copper mining began in Ireland around 2300 BCE (Sheehy-Skeffington & Scott 2021). Approximately at the same time, some seeds of the ‘Lusitanian’ heathers seem to have travelled unintentionally to Ireland, as this heather was used as padding when tools and rations were packed for travel (Scott 2023). These heathers, which grow at the Mediterranean region and in Atlantic Iberia, do not grow in France or Britain. This means that they must have come to Ireland with immigrants who came from Iberia or from the Mediterranean region using a sea route. The evidence of these southern immigrants matches with an old Irish myth, according to which the Milesians arrived to Ireland with a large fleet of ships.⁸⁶ This detail is presented here in order to show that the ‘unreliable myths and legends’ are sometimes less unreliable than they are commonly believed to be.

Even longer trade routes existed during the Bronze Age. Archaeological evidence shows that there was a maritime trade route from the North Sea to the Mediterranean Sea. For example, according to Bunnefeld and Diethrich (2023), a shipwreck at the coast of Anatolia, dated to 1550 BCE, contained amber from the North Sea within its cargo. This suggests a long-distance sea route from the North Sea to the Eastern Mediterranean. The dating of this shipwreck matches with the age of the Dover Bronze Age boat, which has been dated to 1575–1520 BCE and which has been concluded fit for travel over the seas.⁸⁷ Even older boats such as the Ferriby boats

⁸⁵ According to Han (2018) the oldest fishing net weights have been found in South Korea and they have been dated to 27,000 BCE; this is some 6000 years earlier than the oldest fishing nets that had been found in Japan. Outside far-east the oldest fishing nets have been found in Antrea (Finland), dating to 8000 BCE.

⁸⁶ Lebor Gabála Éirenn.

⁸⁷ Dover Museum (retrieved 2023-07-13); additional information available in Clarke et al. (2004) and in Cunliffe (2017).

have been considered valid for sailing overseas (Miller 2001). Boats of the same style, with planks sewn to each other, have been found also in Ireland (Brady 2023). Based on the appearance of the sewn-plank ships in Egypt 2500 BCE, this method would have most likely diffused from Egypt to the coasts of the North Sea, and not vice versa.

Early Iron Age expeditions

After the collapse of the Late Bronze Age between 1200 and 1150 BCE, long-distance expeditions and trade declined within the Greek culture but the maritime Phoenician culture flourished. The Phoenicians had a trading station in Lisbon already around 1200 BCE (Lehmann 2022). This suggests that some Phoenician ships might have sailed on the route from Syria to Portugal and back.

During the seventh century BCE, the Phoenician admiral Hanno sailed from Carthage with 60 ships in order to colonize the Atlantean coasts of Africa.⁸⁸ According to his own *Periplus*, he seems to have sailed as far as Cameroon in tropical West Africa. In addition, the Phoenicians sailed around Africa ~600 BCE making use of the canal that Nechos II had constructed in order to connect the Nile and the Red Sea [Hdt.4.43]. The credibility of the Phoenician expedition around Africa is increased because they reported that the sun was shining from the northern sky most of the time when they sailed around Africa. This detail, which Herodotus did not consider reliable, proves the historicity of the expedition. Another proof concerning such long-distance expeditions at the Iron Age is the voyage of the Persians around Africa during the reign of Gelon of

Syracuse (450–400 BCE). According to Heraclides of Pontus, Gelon received a group of magi to his court and one of them told that his group had sailed around Africa [Strab. 2.3.4]. The word, *magi* is the plural form of an ancient Persian word meaning a “Priest”.⁸⁹ Also other Greek sources report Phoenician or Greek expeditions around Africa or partially around Africa.⁹⁰

In Europe, the most notable early Iron Age voyages have been documented by Festus Avienus. According to him, admiral Himlico (~500 BCE), had sailed to the British Isles from Carthage, and according to Himlico the Phoenicians of Gadeir occasionally sailed also to these Islands [*Ora Maritima*]. The journeys of Himlico and the Phoenicians of Gadeir to Britain suggest that also the copper trade between Ireland and the Mediterranean Sea during the early Bronze Age would have been at least maritime, using the sea route around Iberia.

In the Northern India, the *Pañcāla* were talented seafarers according to Śatapatha Brāhmaṇa [IV.42.1].⁹¹ In the south, the Austronesians sailed from Indonesia to Madagascar around 300 BCE, possibly earlier (Adelaar 2016). Continental Africa connected to Arabia and India via the maritime monsoon trade network already around 300 BCE (Campbell 2019), although even earlier dates have been proposed (e.g. Bellina 2022, 285).

Summary and conclusions

All of these long-distance migrations have been summarized in Table 23, including also information of the distance covered.

⁸⁸ Hanno the Navigator was a high commander of the Carthagians. According to his own *periplus*, Hanno sailed from Carthage with 60 ships in order to colonize the Atlantean coasts of Africa. He first founded six cities, which were called: *Thymiatreon*, *Karikon*, *Teichos*, *Gytte*, *Akra*, *Melitta* and *Arambys*. Out of these cities, *Arambys* has been identified as the city of Essaouira, which was inhabited by the Phoenicians already during the 7th century BCE. The identification was made based on a Phoenician plate that was discovered in Essaouira.

⁸⁹ Magi in Persian is written as *مغ* which is pronounced /moy/. In the Greek world, the meaning of *magi* and *magus* evolved

into “Priest, alchemist, astronomer, and astrologer” or to “The beholder of secret knowledge”

⁹⁰ For example, Eudoxus of Cyzicus reported that he had found in East Africa a shipwreck that belonged to a Phoenician ship that had left from Gadeira, never returning. The sources who tell about the voyage of Eudoxus include Strabo [Geog. 2.3.4], Mela [3.9], Pliny [2.67], and Martianus Capella [4.621].

⁹¹ According to Iorco (e-mail 2024-01-05), some historiographer has mentioned the period of Keśin Dārbhya (900–750 BCE) as the peak of the seafaring activities of the *Pañcāla*, but a reference to this source could not be found.

Table 23: Historical and archaeological evidence of early long distance voyages

Date (BCE)	Description of voyage	Distance (km)	Reference
4000	Sailing ships made of reed were used for travelling at the Persian Gulf.	1000	Carter (2006)
~3500	First sailing ships in Egypt	-	Hornell (2015)
~3000	Indus Valley civilization was capable of long distance seafaring.	?	Rao (1985, 27–29)
3000–2500	Iberians imported Asian ivory from Syria (or from India), which indicates a maritime connection by sailing boats.	At least 4000	Schuhmacher (2017)
2600–2500	Evidence of plank-built boats in Egypt; Egyptians sailed to the Land of Punt (Somalia).	~2900	Carpenter (2023), Breasted (1906–07)
~2300	Lusitanian heathers migrated from Spain to Ireland over the Bay of Biscay along with tin miners.	~1000	(Scott 2023)
~2300	Mediterranean strawberry trees imported to Ireland by copper miners (over a maritime route).	~ 4000	Sheehy-Skeffington & Scott (2021)
1550	A shipwreck at the coast of Anatolia contained amber from the North Sea within its cargo.	Over 6000	Bunnefeld and Diethrich (2023)
1575–1520	Dover Bronze Age boat	-	Dover Museum 2023-07-13
700–600	Hanno the Navigator sailed from Carthage to Cameroon.	~9000	Hanno, Periplus
~600	Phoenicians sailed around Africa.	~35,000	[Hdt.4.43]
~500	The Phoenicians of Carthage and Gadeira sailed occasionally to Britain according to Admiral Himilco.	4800	Festus Avienus [Ora Marit. 100]
550-300	Austronesians sailed to Madagascar.	~7500	Adelaar (2016)
~300	A group of Persians sailed from Persia to Sicily around Africa.	~23,000	[Strab. 2.3.4]
~300	Southeastern Asia and India connect with Africa.	~7500	Campbell 2019

The sailed distances grew relatively modestly from 1000 km to 4000 km in the years 4000–2500 BCE, but then increased rather rapidly from 4000 km to 35,000 km in the years 2300–600 BCE. After the Iron Age, long distance voyages continued in the form of the Viking expeditions, which reached from Scandinavia to Sicily (~5000 km) and from Sweden to the Caspian Sea (~4000 km). It is important to note also these expeditions, as the technology of the Vikings was not significantly more advanced than the technology of the Phoenicians. Therefore, there is no reason to believe that the Phoenicians would not have been capable of sailing from Carthage to Britain. It also means, that any maritime culture that would have been at the level of the Vikings and Phoenicians could have sailed from India to Western Europe already 600–400 BCE.

4.3 Calculation of the main routes between Jalalabad and Edinburgh

Based on GAHAH analysis, the two most central Points of Interest (POI) were the location of the Kalash population in Eastern Afghanistan, and the location of the Scottish population in Scotland. In order to advance towards a Travel Cost Network, the city of Jalalabad was used as an approximation for the location of the Kalash population, because it is along a waterway that connects to the Indian Ocean via the Indus River. In addition, it is also relatively close to the sources of Amu Darya. In Scotland, Edinburgh was used as an approximation of the Scottish population, because its harbor (Leith) is equally accessible from the Baltic Sea and from the Mediterranean Sea. Before analyzing the potential routes between Jalalabad and Edinburgh,

there is a need to review the historical, geographical, and geopolitical context of travel during the years 5200–38 BCE, with focus on 710–206 BCE.

In the years 3000–1900 BCE, the Indus Valley culture of India and Pakistan flourished, and it was capable of long-distance seafaring already 3000 BCE according to Rao (1985, 27–29). This culture collapsed due to a severe draught, which would have acted as a strong push factor for emigrations 2200–2000 BCE. At the British Isles, the first megalithic *henge monuments* appeared ~3000 BCE and the latest phase of Stonehenge was built ~2600 BCE. Around 2300 BCE, the Beaker People arrived to Britain replacing 90% of the earlier population. In Egypt, Pharaoh Senuseret III built a canal that almost connected Nile to the Red Sea approximately 1850 BCE [Arist. Met. 1.14]. This canal still existed around 1380 BCE according to the inscriptions of the temple of Karnak.⁹² Even without being fully completed, the canal would have sped up travel, as it was possible for travelers to deconstruct their ships, carry the planks across dry land, and then reconstruct the ships by sewing the planks again to each other.⁹³ In addition, it is possible that travel services of that time would have made it possible to leave the ship at the Red Sea, and onboard another ship at the canal of Senuseret III. Such services would have been likely during the Hyksos rule of Egypt 1638–1530 BCE, as the Hyksos came from the Middle East or India, and therefore it would have been beneficial for them to maintain an open waterway between the Nile and the Red Sea (see chapter 4.11).

During 710–50 BCE, the British Isles were producing tin that was shipped as far as Greece (see Hdt. 3.115). The trade route between Carthage and Britain may not have passed through France, as the Carthaginians sailed around Iberia to Britain already ~500 BCE (see p. 101). The Roman network of paved roads and traveler's services did not yet reach

the coast of the North Sea, which means that ground travel would have been very slow.

In the Indian Subcontinent, the Indus region was influenced by the Gandahara culture (800 BCE – 1000 CE) and by the Kingdom of Kamboja (700–200 BCE). In addition, the Achaemenid Empire covered parts of Indus region 550–330 BCE, and reached as far as Egypt in the West. In Africa, Pharaoh Nechos II constructed around year 600 BCE a canal that connected Nile to the Red Sea and soon after a Phoenician excursion sailed around Africa using this canal for reaching the Indian Ocean [Hist. 4.43]. Darius I of Persia (522–486 BCE) reconstructed the canal that connected the Nile and the Red Sea. This time the location of the canal was clear, as it went through Wadi Tumilat to the Bitter Lakes and from there to the Gulf of Suez. The motive for the construction of the canal was to connect the southern part of the Achaemenid Empire to the Mediterranean Sea with a waterway.⁹⁴

Barriers: It is possible to extend the migration model of Anthony (see p. 26) by a general hypothesis concerning trespassing and route selection. According to this hypothesis, the Bronze Age and Iron Age civilizations would not have permitted groups of 100–500 migrants to trespass due to security reasons. Groups of more than 10,000 would have probably trespassed without asking for permission, and groups of just a couple of dozens of travelers would have been considered normal trading parties. This means that such migration that would have left a clear genetic mark to the destination of migration would have taken either the form of a long-lasting flow of migrants or the form of a larger fleet of migrant ships, travelling along routes that could not have been intercepted by Bronze Age and Iron Age civilizations. This hypothesis, however, would require some support from empirical studies.

Enablers: It is likely that traveler's services emerged already during the Bronze Age along the

⁹² Encyclopedia Britannica, Suez Canal.

⁹³ This is the method that the Egyptians used for travelling to the Land of Punt, which was located most likely to Somalia.

⁹⁴ According to the Shaluf Stele, “King Darius says: I am a Persian; setting out from Persia I conquered Egypt. I ordered

to dig this canal from the river that is called Nile and flows in Egypt, to the sea that begins in Persia. Therefore, when this canal had been dug as I had ordered, ships went from Egypt through this canal to Persia, as I had intended.”

shortest and least costly routes between distant regions. This would have applied especially to river routes. Such services may have varied from the sale of food and rations to the hiring of rowers and to the sale of large rowing boats. There is evidence of such traveler's services from the Viking period, but

earlier evidence is difficult to discover due to the lack of historical sources.

Routes: A map that illustrates these routes is shown in Figure 10 (p. 103). The detailed route data concerning these alternatives has been presented in Appendix table 3.

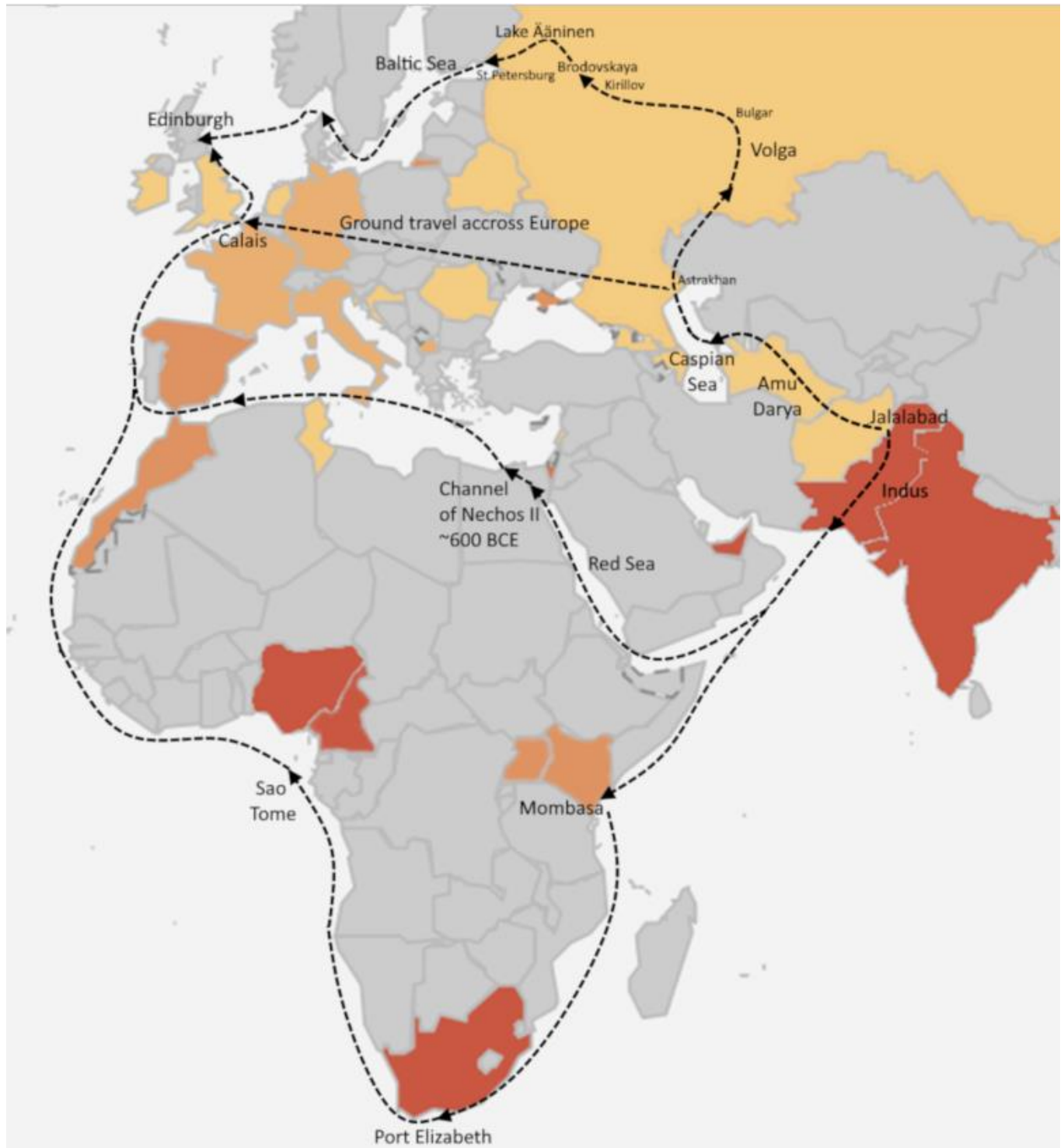


Figure 10: Main alternatives for the travel route from Eastern Afghanistan to Scotland

The ground travel distances were estimated based on Google Maps. The sailing distances were estimated based on Ports.com and based on the assumption that basic navigation skill to cross short distances over open seas would have been known.⁹⁵ This would have allowed some short cuts across open sea, for example, crossing the Gulf of Guinea via Sao Tome, and crossing the Bay of Biscay without following the coastline. The river route distances were obtained from Wikipedia and Google Maps. Variants of these routes can be formed, but they are not likely to have a major effect to the minimum travel times. For example, it is possible to row from the Caspian Sea up the river Volga, and then pull the boat across dry land to River Don, which flows to the Black Sea. From there it is possible to sail to River Dnepr, which would lead towards north until Old Smolensk, where boats would have to be pulled across dry land

to River Vainäjoki, which was connected to the Baltic Sea. This variant, however, would be unlikely to speed up travel. On the other hand, it is possible to reject the assumption of sailing over open seas, or to limit the distance over open seas to some hundreds of kilometers. This would notably lengthen the travel time from Spain to Ireland, but the same extension of the route would be equally applicable to the India → Mediterranean → Ireland route and to the India → Cape of Good Hope → Ireland route.

Calculating the required travel times

The identified main routes can be converted to travel days by using the travel speeds of the following table, which is partly based on the travel times taken from ORBIS.

Table 24: Comparing the speed of different ancient means of transportation

Means of travel	Speed (km/h)	Length of travel day (h)	Daily travel (km)
Modern eight-man shell	22.4	6	134
Roman sailing boat or equivalent	10.7	12	129
Greek trireme or equivalent	12.5	8	100
Rider with a fresh horse (good terrain)	7.0	8	56
Old wooden rowing boat with 12 oars	5.0	8	40
Marching along a good road in good weather	4.0	8	32
Horse wagon	4.0	8	32
Rowing - one or two rowers	3.5	8	28
Plaustrum (heavy Roman wagon)	2.5	8	20
Marching in bad weather or terrain	2.0	8	16

In the table, the fastest means of transportation is the modern eight-man shell (rowing boat), which can reach the speed of more than 22 km/h. Such a speed, however, cannot be maintained more than a few hours per day whereas an ancient Roman sailing boat (or equivalent) could travel at least 12 hours per

day during daylight. River routes, however, require knowledge of the maximum size of the rowing boat that can navigate up the river, average speed of the current, and knowledge of such rapids and waterfalls that might block advancement along the river. In most cases, large rowing boats like the

⁹⁵ According to Dahlström (2023), many cultures all around the world have developed similar approaches to the navigation

over open sea based on the position of stars and sun, direction of waves and winds, and the appearance of specific animals such as birds.

Greek triremes or the Viking longboats could not enter narrow, shallow, rocky, or very curvy river routes. Therefore, the speed of travel for the Eastern River route from the Amu Darya to the Baltic Sea has been calculated based on a wooden rowing boat that has 12 oars and 12–24 rowers. The upstream and downstream speeds for such a rowing boat depend on the velocity of the river. On a relatively slow river, the speed of current is approximately 0.5 m/s, and on a very slow river such as Volga, the speed may be as slow as 0.25 m/s. If the journey starts at approximate sea level, never goes via high altitudes, and ends at approximate sea level, then the speed of the current is not very relevant. This is because the river slows down travel while rowing upstream, and speeds up travel while rowing downstream. For example, the travel from the Caspian Sea to the Baltic Sea via River Volga starts and ends at approximate Sea Level. The highest point along the route is only about 120 m above the sea level.⁹⁶ Based on this, the duration of travel from the Caspian Sea to the Baltic Sea has been calculated without taking into account the speed of the current of River Volga and the other rivers on the route. Based on the same principle, the speed of current was not taken into account while calculating the travel time from Suez Port to Zagazig.

For ground travel, the duration of travel between two locations was calculated based on the assumption that the walking distances that Google Maps proposed would have been optimistically short in the context of Bronze Age and Iron Age. During these times, swamps, mountains, and dense forests would have caused the need to take a much curvier route than what can be used in the modern times. Based on this, the distances proposed by Google Maps were balanced by assuming only 16 km of travel by day, which matches daily advancement of an army along rough terrain. Alternatively, the speed per day could be increased but the route would have to be extended due to a less direct route. Based on these principles, the travel times for the four alternative routes from Jalalabad to Edinburgh have been calculated to Table 25 (p. 106). The calculations were based on

the assumption of a perfect time of year for starting the travel, meaning that the freezing of rivers would not stop advancement via waterways, and that the seasonal winds and storms would not have been especially challenging during the travel. Based on these calculations, the fastest route from Jalalabad to Edinburgh would have passed through the channel of Pharaoh Nechos II, and via the Mediterranean Sea (4.5 months). The first leg of this route, however, is risky from June to September due to the monsoon season of the northern hemisphere. Another complication of this route is that the canal that connects the Red Sea to the Nile may have been navigable only during the flood of the Nile, which occurs between April and May at the location of the canal. After that period, it is difficult to sail from east to west at the Mediterranean Sea due to contrary winds until the end of August (Gal 2023). This would add about 90 days of waiting time to the duration of this route. Due to this challenge, one variant of this route would have been to sail from Karachi to Suez, and then cross the Isthmus of Suez on foot, and continue again by boat to Edinburgh from the Mediterranean coast. This alternative, however, would have required an active trade route from Egypt to Edinburgh so that travelers would have been able to continue their travel onboard a trade boat. Larger parties of migrants could not have used trade boats as a means of travel, as several ships would have been needed. Another challenge for the usage of the Mediterranean route may have been the wish of the Egyptians to block trespassing of all large groups of travelers due to military security. During the 522–486 BCE, however, the Achaemenid Empire controlled an area that included both the Indus Valley and Egypt. Therefore, traders and migrants from the northern part of the Indus Valley would have most likely been permitted to travel to the Mediterranean Sea via this route without problems. The evidence that supports the usage of this route is presented in chapter 4.8.

The second fastest route would have passed from Jalalabad to the Caspian Sea via Amu Darya, and then to the Baltic Sea along River Volga (6.5

⁹⁶ Vytegra 120 m, Kirillov 120 m

months). One challenge of this route is the leg from Jalalabad to Kerki (885km) which probably had to be travelled on foot, as the steep inclination of Amu Darya close to its sources would have made boating too risky. From Kerki to the Caspian Sea, Amu Darya was navigable but did not always connect to

the Caspian Sea; instead, it ended at Lake Aral. From Astrakhan to the Baltic Sea, the main obstacle would have been the freezing of the waterways between November and May. The evidence that supports the usage of this route has been presented in chapter 0.

Table 25: Duration of travel from Jalalabad to Edinburgh via four alternative routes using ancient means of transportation

Route	Leg	Type	Distance	Duration Jalalabad-Edinburgh	Duration Edinburgh- Jalalabad
Continental route	Jalalabad–Kerki	Ground travel	885	55	55
	Kerki–Astrakhan	Rowing downstream Amu Darya and along the Caspian Sea	1200	30	47
	Astrakhan–Calais	Ground travel	3725	233	233
	Calais–Edinburgh	Sailing	859	7	7
	Total		6669	325 days = ~10.5 months	342 days = ~11 months
Eastern river route	Jalalabad–Kerki	Ground travel	885	55	55
	Kerki–Astrakhan	Rowing downstream Amu Darya and along the Caspian Sea	1200	30	47
	Astrakhan–Bulgar	Rowing along River Volga	1500	38	38
	Bulgar–Brodovskaya	Rowing along Volga and tributaries	1500	38	38
	Brodovskaya–River Vytegra	Pulling ship across dry land	0,5	1	1
	Vytegra–St. Petersburg	Rowing downstream and along lakes	500	13	20
	St. Petersburg–Edinburgh	Sailing	2895	22	22
	Total		8480	196 days = ~6.5 months	220 days = ~7 months
Mediterranean route	Jalalabad–Karachi	Rowing downstream	1693	25	66
	Karachi–Port Suez	Sailing	5702	44	44
	Suez–Zagazig	Rowing upstream and downstream	151	4	4
	Zagazig–Alexandria	Rowing downstream	180	5	5
	Alexandria–Edinburgh	Sailing	7480	58	58
	Total		7660	136 days = ~4.5 months	177 days = ~6 months
Route around Africa	Jalalabad–Karachi	Rowing downstream	1693	25	66
	Karachi–Mombasa	Sailing	5067	39	39
	Mombasa–Port Elizabeth	Sailing (strong current)	4311	23	49
	Port Elizabeth–Sao Tome	Sailing	5263	35	41
	Sao Tome–Edinburgh	Sailing	9823	76	76
	Total		19398	199 days = ~6,5 months	271 days = ~9 months

The third fastest route would have been the route around Africa (6.5 months). Sailing from Karachi to Mombasa is risky from June to September due to the

monsoon season of the northern hemisphere. From Mombasa to the Cape of Good Hope, the speed of sailing is increased by the Agulhas Current, which

flows towards the Cape of Good Hope at the speed of approximately 1.36 m/s. In addition, travel speed will probably increase due to the reliable trade winds that work towards the same direction. If travelers leave Karachi in early October, they will have a good chance of passing the Cape of Good Hope before December of the same year. This is important, as in December, the strong Westerly winds are so strong that sailing around the Cape of Good Hope is risky. Travel from the Cape towards Sao Tome is aided by the Benguela Current, which flows in this direction at the speed of approximately 0.5 m/s. The challenge of this route is that it would have required the existence of a chain of friendly harbors at the coast of Africa. Otherwise, the travelers would have needed to cultivate their food along the way, which is what the Phoenicians did when they navigated around Africa ~600 BCE, using two years for their expedition.⁹⁷ Modern sailing speeds can be used as a point of comparison to ancient sailing: With a modern sailing boat, the travel time from Pakistan to Scotland is about 60 days, assuming the start of the journey in January or February and continuous sailing, day and night.⁹⁸

The evidence that supports the usage of this route has been presented in chapter 4.5. The ground route from Jalalabad to Calais has been ignored, as it would have been clearly the slowest route, assuming the absence of paved roads and well-organized traveler's services 3000–200 BCE.

If the barriers and enablers along these routes were taken into account, the feasibility of the Mediterranean route would be reduced at all times except for the Hyksos period (1638–1530 BCE) and the Achaemenid period (522–486 BCE). The feasibility of the eastern river route would have been reduced at least during the times when Amu Darya did not flow to the Caspian Sea. During these periods, the route around Africa would have been the most likely migration path, especially when moving from the Indus Valley to Scotland, assuming the existence of friendly colonies along

the way. Such colonies were not yet reported by the Phoenicians, who sailed around Africa ~600 BCE.

Formulation of migration corridors based on GAHAH and LCA

In this study, GAHAH analysis meant the usage of GAHAH data for deducing the time, volume, and route of migrations between the two regions.

GAHAH is an abbreviation of the Genetic Atlas of Human Admixture History. It is based on the study of Hellenthal et al. (2014), in which the genes of approximately one hundred contemporary populations were studied. By using probability calculations, the research group was able to calculate likely *admixture events*, which would explain why some current populations are so similar to each other. The admixture events are presented in GAHAH as arrows from location L1 to location L2. Each arrow is presented with the *likeliest date of migration*, followed by a 95% confidence range.

The admixture events can be interpreted as migrations. If GAHAH shows an arrow between locations L1 and L2, it means that there has been migration from L1 to L2 or vice versa, or from some unknown urheimat to the locations L1 and L2. This unknown urheimat could then be analyzed based on the methods of chapter 2.5 (p. 65). Although the potential existence of these unknown urheimats makes the deduction of migration paths more challenging, in many cases there is so much data concerning migrations between the locations of the GAHAH map that additional unknown urheimats no longer need to be considered. The migration arrows may show, for example, a clear migration route between L1 and L2, and therefore it is possible to conclude that it would have been unlikely that all the points along this migration route would have received their genes from an unknown urheimat that would have existed outside this migration route.

Migration period means the period, during which a migration event or a series of migration events most likely occurred. Long-distance migration may be

⁹⁷ [Hdt. Hist. 4.43]; for a longer analysis, see p.191.

⁹⁸ This calculation was made by Dr. Wesa Perttola based on qtVlm application, into which wind statistics concerning year

2022 were imported from the Copernicus wind data, <https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-single-levels?tab=form>. The route was forced close to the continent, which makes the travel distances longer.

point-to-point migration between two distant locations within just a couple of months or years, or gradual migration of a group of people to distant regions over several decades or centuries (see p. 24).

Simple Migration Corridors are GAHAH arrows that have a starting point and an end-point, and no *legs*, which are the intermediate steps along the route. Simple Migration Corridors can be one-way or multiway corridors.

Push, pull, and enablers: According to the theories of migration, people are likely to migrate if there are push factors, pull factors, and enablers for migration (see p. 108). The Indus Valley culture was capable of long-distance seafaring already 3000 BCE (Rao 1965 and 1985), which is an enabler for long-distance migrations. Around 2200–2000 BCE, there was a severe draught in the Indus Valley that would have acted as a push factor. The accounts of distant islands that were *blessed with plentiful rainfall all year long* would have acted as a pull factor, attracting people especially during the draught of the Indus Valley. An additional pull factor would have been the abundant quantities of tin at the British Isles, which were widely known as the Tin Islands.

Aggregated, extended, and elaborated Migration Corridors

Migration Corridor refers to the likely migration period and route of the migrations from the starting point to the destination. The purpose of GAHAH analysis is to advance from hundreds of *Simple Migration Corridors* (admixture arrows) towards more meaningful Aggregated Migration Corridors, which act as models for the migrations between the selected two locations. The first way for doing aggregations is to group together GAHAH locations that are close to each other. Based on that, it is possible to group together all locations that were at the vicinity of the Indus River in order to define an aggregated *Indus region* (p. 28). In the similar manner, all locations at the coasts of the North Sea can be aggregated to the North Sea region. After this, the focus of GAHAH analysis would be to study the migrations between Indus region and the North Sea region during the chronological scope of

the study. Another dimension in these aggregations is time. If there are several Simple Migration Corridors from one region to another at different periods, they can be joined into one Aggregated Migration Corridor.

Stints are shorter migration periods (or migration waves) within an Aggregated Migration Corridor. The Stints are identified based on the Likeliest Dates of Migration. For example, if a Migration corridor contains Simple Migration Corridors with the likeliest migration dates 3052, 2723, 887, and 654 BCE, this Aggregated Migration Corridor can be divided to two Stints, which are 3052–2750 BCE and 887–654 BCE.

Once a migration corridor has been aggregated, it can be extended, elaborated, or disaggregated into legs. An *Elaborated Migration Corridor* is an Aggregated Migration Corridor, which has been created by taking into account archaeological, historical, linguistic, onomastic, cultural data, or other genetic sources of data in order to calibrate or improve the route or dating of the corridor. An *Extended Migration Corridor* is a corridor that has been extended beyond the original destination or starting point, based on additional data. Aggregated Migration Corridors can be one-way or multiway corridors. Based on the principle of *counter-currents*, most migration corridors would have been at least partly multiway (see p. 25).

Disaggregated Migration Corridors are based on Aggregated Migration Corridors that are broken into legs. This disaggregation can be done by combining LCA (see p. 27) and GAHAH data concerning other migrations that would match the route of the aggregated Migration Corridor. For example, according to GAHAH there have been migrations from North Sea to *Brodovskaya* (see p. 103), to *Chuvash* (along River Volga), to Afghanistan, and to the Indus Valley. Based on this, the aggregated North Sea – Indus migration corridor can be broken to the North Sea – *Brodoskaya* leg, to the *Brodoskaya*–*Chuvash* leg, and to the *Chuvash*–Indus leg. This route matches with the eastern river route that has been shown on p. 103, which makes it possible to disaggregate the migration corridor even further into the legs that are shown in Figure 10. At

The migrations from Africa to India ~3034 BCE could be explained by the attraction of the Indus Valley culture, and the migrations from India to Ethiopia ~1886 BCE could be explained by the draught that devastated Mesopotamia and India 2200–1900 BCE, causing the Indus Valley culture and the Sumerian culture to disintegrate. Later on, there was a separate migration wave from India, East Africa, and Middle East to Namibia ~850 BCE, although the 95% range of confidence for this migration is very wide. Based on LCA, these migrations would have been maritime, following the sea route around the Cape of Good Hope. These dated migration events receive some weaker support from undated genetic data. The Hadza people in northern Tanzania have some genetic similarity with the following populations of the Indian Peninsula: Sindhi (1.7%), Indian (0.2%), Pathan (0.2%), Balochi (0.1%), and Burusho (0.1%).⁹⁹ The Sindhi population is located at the mouth of the Indus Valley, which has the shortest geographical distance to East Africa.

Archaeological evidence

According to Leiju et al. (2006, 104), Asian bananas were cultivated in Uganda already 3220 BCE, and according to Boivin et al. (2014, 552), African sorghum millet was cultivated in India ~2500 BCE. This suggests that Indians would have first imported Asian bananas to Uganda ~3220 BCE, after which some Africans would have migrated from Kenya and Tanzania to the Indus Valley ~3034 BCE, as indicated by GAHAH data. The migration of African sorghum millet to India ~2500 BCE would have been just a continuation of these earlier migrations. Additional evidence is provided by Lal (1963), according to whom Dravidians and the African C-Group people used similar black and red ware (pottery), built similar burial complexes incorporating megaliths and circular rock enclosures, and used the same type of rock cut sepulcher.¹⁰⁰ The C-Group culture existed in Lower

Nubia 2400–1550 BCE.¹⁰¹ This matches with the time, at which there was migration from India to Ethiopia (~1886 BCE).

An alternative explanation for the migration of Asian bananas to Africa and African sorghum millet to India is the assumption of a tightly integrated trade network, possibly coordinated by Sumerians. The trade network interpretation receives support from Rao (1985, 27–29), according to whom Indus Valley civilization was already advanced in long distance trade around 3000 BCE. In addition, it is supported by Moorey (1999, figure 2.8), according to whom the trade routes of the Indus Valley civilization reached at least as far as Mesopotamia. The potentially central role of Sumerians in the trade network that connected India and Africa is suggested by a Zanzibari copal necklace, which has been found in the city of Ur in Sumer and which was dated to 2500–2400 BCE (Beaujard & Fee 2005). Although the trade network interpretation could explain the migration of artefacts and ecofacts between India and Africa, it does not explain well the migration of Indian genes to Ethiopia ~1886 BCE unless we assume that the genes were carried by merchants who had children in Ethiopia but did not settle down in Ethiopia as immigrants.¹⁰²

According to Campbell (2019), the monsoon trade network connected Africa and India 300 BCE – 300 CE but then deteriorated due to political and ecological upheavals. The connection between India and East Africa appears again in the form of a bronze figure of a lion, which was found in Kenya, dated to ~1100 CE. This figure is of an Indian style, but the lion itself is an African and not an Asian lion. This suggests that the artisan who did the lion would have been an Indian, who had migrated to Africa (Hawkes and Wynne-Jones 2015). In addition, a rhinoceros figurine with one horn only, has been found in southern-Africa, dated to the 13th century. As one-horned rhinoceroses are found only in India, the figurine could be of Indian origin (*Ibid*).

⁹⁹ *Genetic Atlas of Human Admixture History*, Hadza (FullAnalysis); Retrieved 2022-07-10.

¹⁰⁰ Lal, B.B. (1963) The Only Asian Expedition in threatened Nubia: Work by an India Mission at Afyeh and Tumas. The Illustrated Times, London 20 April; referenced by Winters (2012b, 5).

¹⁰¹ Ancient Nubia: C-Group–Pan Grave–Kerma 2400–1550 BC. The Oriental Institute. Retrieved 2023-03-25.

¹⁰² According to Beaujard (2005, 241), the first distinct phase (“pulsation”) in the emergence and development of the Afro-Eurasian world-system of international maritime appeared already during the third millennium BCE.

According to M. C. Horton (2004), there is also large quantity of Indian style ceramics of the 11th century onwards in Shanga and Tumbatu in Kenya (*Ibid*). Horton (2004) and Hawkes and Wynne-Jones (2015) interpreted these connections in the material culture as signs of migration.

Historical evidence

According to Claudius Aelian (~170–235 CE), some Libyan tribe was “bordered upon” by the Indians [*Aelian NA 16.33*]. This suggests that Indians had colonies in some part of Africa, and the context of this passage suggests that Aelian was describing an East African tribe.¹⁰³ Philostratus provides the following pieces of evidence concerning the Indian presence in East Africa. According to him:

1. The Ethiopians were colonists who were sent from India [*Life.of.Apoll. 6.16*].
2. The Ethiopian and Indian race dwelt in Africa at the time when Egypt stretched its borders beyond Meroe and the cataracts, and the Indians founded sixty cities in Aethiopia during this time [*Life of Apoll. 3.20*]. This description fits only the *New Kingdom of Egypt*, meaning the years 1550–1070 BCE.
3. The Aethiopians¹⁰⁴ and Indians of Africa were ruled by King *Ganges*, which is an Indian name (the *River Ganges* flows to the Bay of Bengal). This suggests that an Indian monarch ruled a kingdom of Ethiopians and Indians in Africa sometime between 1550 BCE and 1070 BCE.

In general, colonial cities were founded to create a network of cities that were several days or a couple of weeks of travel from each other – not right next to each other. This means that the assumed 60 Indian cities would have been located most likely along the coast of Africa, a couple of hundreds of kilometers from each other. If we assume that half of the cities were founded at the seashore at distances of 300 km

from each other, then the chain of 30 cities would have covered 9000 km of African coastline, reaching from the peninsula of Somalia all the way to Angola at the Atlantic Ocean. The idea of a long chain of coastal settlements is supported by the following pieces of evidence:

1. According to Burkharin (2012, 503) Arab geographers confirm that there was an Indian colony at the island of Socotra, which was conquered by the Greeks at the times of Alexander the Great. This matches with the flow of Indian genes to Ethiopia around 1886 BCE, as Socotra is on the route from India to Ethiopia.
2. According to al Idrisi (1150 CE), a major proportion of the inhabitants of the city of Sayuna in Mozambique were Indian still in the 12th century CE (*Wood et al. 2012, 72*). This could possibly receive support from genetic studies of the populations of Southeast Africa, but GAHAH does not have any data points close to Sayuna. Yet, the text of al Idrisi is dated approximately to the same time, when an Indian bronze figurine was found in Kenya (see p. 110).
3. According to Vasco da Gama, there were Indians living in Mombasa (Kenya) and an Indian pilot took him to Goa (see *Upadhyaya & Upadhyaya 1983*).
4. When Barbosa recorded Gujarati ships at Malindi and Mombasa 1500 CE, the “presence of Gujaratis in East Africa was neither unusual nor new” (Abu-Lughod, 1989, p. 272).

Although the historical evidence provided by Philostratus, Aelian, and the Arab geographers is coherent with the archaeological and genetic evidence, the claims concerning Indian presence in Africa have been questioned based on the ***confusion argument***. According to Mayerson (1993), Byzantine scholars sometimes used the term *India* to refer to Ethiopia or Arabia. According to

¹⁰³ In Greek texts Libya was generally used to refer to the narrow triangle that had Gibraltar, Somalia, and Alexandria at its corners. This is illustrated by the *map of Anaximander* (~610–546 BCE) and the *map of Hecataeus* (~550–476 BCE).

¹⁰⁴ Aethiopia was the Greek name for that part of Libya (Africa) that was located south from Egypt [*Hdt. 3.114*].

Mayerson, this shows that they were confused and therefore unreliable sources. The counter-intuitive location of India to Ethiopia or Arabia, however, can be explained by the presence of ethnic Indians in Ethiopia since ~1886 BCE (GAHAH) and in Mozambique still around 1150 CE (al Idrisi). In addition, it is likely that the Byzantine scholars used *Dictys of Crete*, *Philostratus*, *Aelian*, *Diodorus Siculus*, and *Pliny the Elder* as their sources, and all of these sources wrote about the Indian presence in Ethiopia or Aethiopia (see above and p. 113). Therefore, it seems that the Byzantine scholars were not confused and instead were informed by the earlier historical texts. This interpretation is supported by tentative archaeological evidence, according to which the Dilmun culture of Bahrain might have been a Harappan colony (see chapter 4.7). In addition, there were migrations from India to the current region of United Arab Emirates 1110–794 BCE according to GAHAH.¹⁰⁵ Based on this, the Byzantines seem to have referred to ancient Indian colonies in Arabia and Ethiopia when they located India to Arabia or Africa. This means that the Byzantine sources could actually be used as tentative evidence for the India – East Africa hypothesis.

Cultural evidence

According to Upadhyaya & Upadhyaya (1983), the worship of the Mother Goddess is an ancient tradition that existed in Dravidian India before 1500 BCE, in Pre-Hellenistic Greece, and in ancient Africa, but which currently remains only in some parts of India and Africa. This suggests a tight cultural connection between India and Africa during the late Bronze Age or early Iron Age. In the traditions of this religion, Mother Goddess resided in the earth whereas her masculine counterpart was a passive figure. In addition, the son of the Mother Goddess, *Murugan who is the god of the mountains*, is worshipped in Dravidian India as *Murugan* and in twenty-five indigenous peoples in East Africa as *Murugu*. The Mother God of Southern India is called as *amma* (mother), and the same word *amma*

is used by the Dogons of the French Sudan who build altars in order to sacrifice for the deity *amma*. According to Upadhyaya & Upadhyaya (1983), the Dravidian *Gond* people in Central India still build houses similar to those erected by the *Gallas* of Somaliland. This similarity, however, would have to be described and measured in more detail.

Linguistic evidence

According to Krishnamurti (2003, 470–488), the Somali, Afar, Oromo, and Amharic languages of the Horn of Africa contain several Dravidian loan words. The migration of these words could match the genetic migrations from Western India to Ethiopia ~1886 BCE. According to Homburger (1952), a relatively big African Bantu state existed between Lake Victoria and the ports of Mombasa and of Melude starting from early first millennium CE. According to her, “*the linguistic facts show that this state was organised by the Kannadas. The demonstrative prefixes a-, i- (e-, o-, u-) followed by different elements used as pronouns are common in Kannada and in Bantu languages.*” *Kannada* is a Dravidian language spoken in Southwestern India. Although Homburger’s findings do not confirm migrations 3000–50 BCE, they show a close historical connection between India and East Africa, which matches with the archaeological and genetic findings concerning the earlier connections. When one opens the map of Mombasa and checks where the local place names appear as anthroponyms, the result is that India has the highest appearance figures (e.g. *Bamburi*, *Kisauni*, *Shanzu*, *Nyali*, and *Ngina*).

According to Wichman (2023), the diffusion rate of African languages was very high 3000–2500 BCE. This matches with the archaeological and genetic data, which suggest maritime migrations from India to East Africa 3000–2500 BCE.

Old traditions and legends

According to Greek mythology, *Tithonus* was the prince of Troy. He fell in love with Eos (Aurora) who took him to Ethiopia where she bore Emathion and Memnon. According to *Dictys of Crete*,

¹⁰⁵ [Genetic Atlas of Human Admixture History](#), UAE (FullAnalysis:first event); Retrieved 2023-01-13.

Memnon came to help the defenders of Troy with a large army of Indians and Ethiopians [Dict. 4.4]. The Trojan War occurred approximately 1187–1177 BCE (p. 42). The motif concerning the close connection of the Indians and Africans is repeated by Ovid, who wrote about the *Indian neighbors* of Aurora and Tithonus [Ovid. Am. 3.11]. These passages suggest that Memnon and Tithonus would have lived most of their life in Ethiopia, keeping an active contact with India or with the ethnic Indians of Ethiopia (p. 109). According to Diodorus Siculus there is some argument about the capital city of Memnon as some claimed that it was Susa in Mesopotamia¹⁰⁶ whereas the Ethiopians claimed that Memnon's palace, *Memnonia*, was located in Ethiopia and that it still existed there [Libr. Hist.

II.22.4]. The Ethiopian version of the story of Memnon receives support from Pliny the Elder, according to whom the tribe of the *Memnones* lived in Ethiopia [Nat. Hist. VI.189].

Kintu and Nambi: According to a Ugandan legend, the early ancestors of the indigenous people of Uganda were *Kintu* and *Nambi* who came from the land of gods.¹⁰⁷ This legend has a tentative match with the appearance of the Asian bananas in Uganda in 3220 BCE. The interpretation of Kintu and Nambi as Indian immigrants receives some tentative support from the names *Kintu* and *Nambi*, which are currently more frequent as anthroponyms in India than in East Africa, based on the data that was retrieved from forebears.io (Figure 11 below).

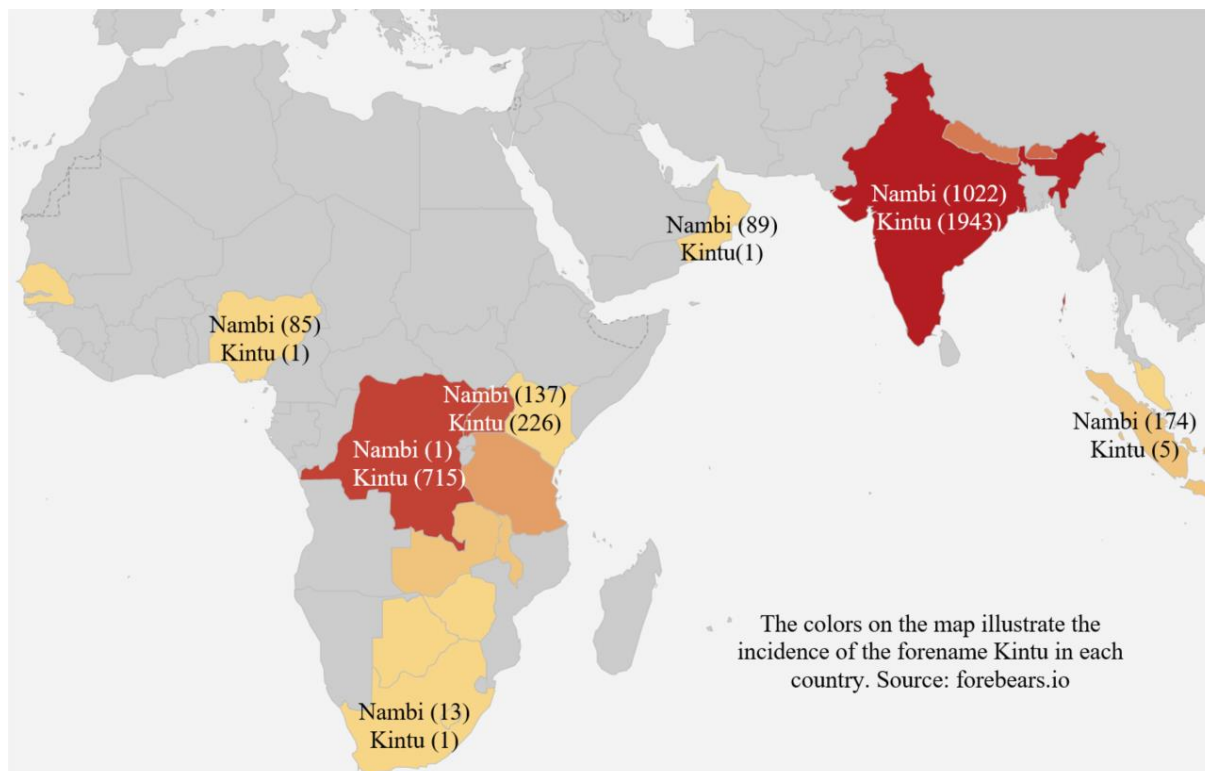


Figure 11: Geographic distribution of forenames Kintu and Nambi

Megasthenes and Indika: Megasthenes, who was a diplomat at the court of the Indian King Chandragupta Maurya around 300 BCE,

documented an Indian legend according to which *Heracles* was born in the hill country of India.¹⁰⁸ According to this legend, Heracles participated in

¹⁰⁶ For example, according to Herodotus, prince Memnon had his city in Mesopotamia [Hdt. Hist. 5.53 & 7.151].

¹⁰⁷ Encyclopedia.com, "[African mythology](#)"

¹⁰⁸ Although the work of Megasthenes has been lost, his work survives in the quotes and references written by Arrian [Indica 8] and Diodorus Siculus [Libr. Hist. II.38]

the founding of the first walled cities in India, became one of the first Kings of India, and later on traversed all sea and land.¹⁰⁹ The dating of this Indian Heracles to the time of the first Indian walled cities would date him approximately 3300–2600 BCE, to the Early Harappan period. This matches with the time when the cultivation of Asian bananas started in Uganda (3220 BCE), and when the cultivation of the African sorghum millet started in India (2500 BCE). The motif of *traversing all sea* suggests that he might have visited East Africa. This

interpretation matches with the legend of Kintu and Nambi, and with the genetic, archaeological, and cultural evidence, which connects India with Africa.

Evaluation of the hypothesis

According to the India → East Africa hypothesis, *there were several migration waves from India to East Africa 3300–500 BCE*. The evidence that supports this hypothesis has been summarized to Table 27 below.

Table 27: Summary of the evidence concerning the migrations of Indians to East Africa 3300–900 BCE

#	Type of evidence	Central evidence	Strength of evidence
1	Archaeological (p. 110)	Asian banana trees were cultivated in Uganda already 3220 BCE (Leiju & al 2006, 104) and the cultivation of African sorghum millet started in India around 2500 BCE (Boivin et al. 2014, 552). This suggests migrations to both directions 3220–2500 BCE.	Moderate or strong
		According to Lal (1963), the Dravidians and the people of lower Nubia used similar black and red ware pottery and built similar burial complexes incorporating megaliths and circular rock enclosures, and used the same type of rock cut sepulcher. According to Beaujard & Fee (2005), a Zanzibari copal necklace was found in Ur, dating to 2500–2400 BCE. This indicates a trade route already at that time.	Tentative
2	Genetic (p. 109)	Indus Valley received migration from Kenya and Tanzania ~3034 BCE, and people from the west coast of India migrated to Ethiopia ~1886 BCE (GAHAH). There was migration from India to Namibia ~850 BCE.	Moderate or strong
3	Historical (p. 111)	According to Philostratus, King Ganges of India ruled in East Africa 1550–1070 BCE [Life of Apoll. 3.20]. According to Aelian (~170–235 CE), some Libyan tribe was “bordered upon” by the Indians in East Africa [Aelian NA 16.33].	Moderate
		According to Arab geographers, there was an Indian colony at the island of Socotra ~300 BCE (Burkharin 2012, 503). According to al Idrisi, almost half of the inhabitants of the city of Sayuna in Mozambique were Indian still in the 12 th century CE (Wood et al. 2012, 72).	
		According to Vasco da Gama and Barbosa, there were Indians living in Kenya in the 15 th century and Indian ships could be seen in the harbors (Upadhyaya & Upadhyaya (1983).	
4	Linguistic (p. 112)	According to Krishnamurti (2003, 470–488), the Somali, Afar, Oromo, and Amharic languages of the Horn of Africa contain several Dravidian loan words. According to Homburger (1952), a relatively large Bantu state near Mombasa was organized by the Kannadas of India, starting from the beginning of the first millennium BCE.	Tentative
5	Cultural (p. 112)	<i>Murugan</i> , who is the god of the mountains and the son of the Mother Goddess, is worshipped in Dravidian India as <i>Murugan</i> and in twenty-five indigenous peoples in East Africa as <i>Murugu</i> (Upadhyaya & Upadhyaya 1983).	Weak or tentative
6	Old traditions	Three unreliable traditions match with the India → East Africa hypothesis: 1) the story of Tithonus and Memnon, 2) the story of Kintu and Nambi, and 3) the story of Indian King Heracles (p. 112).	Very weak
Total evidence			Moderate or strong

¹⁰⁹ Arrian [[Indica 8](#)] and Diodorus Siculus [[Libr. Hist. II.38](#)]

Due to the relatively large quantity of genetic, archaeological, and historical evidence, the evidence can be summed up as *moderate or strong*.

4.5 India → Africa → Western Europe hypothesis

According to this hypothesis, *a large group of Dravidian speakers sailed to West Africa at some point of time 1500–500 BCE and to Western Europe 1500–200 BCE*. There is a lot of evidence to support this hypothesis, but most of the evidence is only tentative. In addition, some evidence is obtained from unreliable sources. That poses a challenge to the interpretation of the evidence.

Historical and onomastic evidence

The presentation of historical and onomastic evidence in this section starts with connections from India to southwestern Africa, and then advances to connections to more distant regions such as Western Europe.

India–Angola connection: There is a city called *Benguela* in western Angola. This city is located relatively close to the Namibian SanKhomani population, which received genes from India around 850 BCE according to GAHAH. Therefore, it is possible that the name of this town originates from *Bengal*, and *Bengue* would mean a person who came from Bengal.

India – West Africa connection: According to Juba of Numidia, the *Atlantic Sea* begins at the Promontory of Mossylum, and from there it is easy to sail to his native country, Mauritania [Plin. *Nat. Hist.* II.34.97]. This suggests that the Promontory of Mossylum would have been the Cape of Good Hope from where it is relatively easy to sail to Mauritania, with the help of sea currents and southeastern winds.¹¹⁰ After describing Mossylum, Juba

continues by telling that sailors who aimed at Gibraltar, needed to pass first the “*promontory of the Indians, known as Lepteacla, and by others called Drepanum*”.¹¹¹ This suggests the Indians would have had a colony at a promontory that was located between the Cape of Good Hope and Mauritania, for example, at the promontory of Gabon, at the promontory of Nigeria, or at the promontory of Senegal. Out of these alternatives, Senegal is supported by the almost 500 of similar words that N’Diaye (1978) identified in the Wolof language of Senegal and in the Dravidian languages of India.

There is, however, one anomaly in this explanation. According to Pliny, *Mossylum* was the most distant place where Pharaoh Sesostri brought his army in the 2nd millennium BCE [Nat. Hist. VI.35], and according to the Periplus of the Erythraean Sea, the *Mossylum* (Mosylon) was located at the promontory of Somalia. This interpretation matches with by Juba, according to whom the *Atlantic Sea begins at the promontory of Mossylum*: At the times of Herodotus, Juba, and Strabo, the Greeks and Romans perceived the *Atlantic Sea* as the mighty ocean that surrounds Eurasia and Africa.¹¹² From that perspective, the *Atlantic Sea* would have begun at the Horn of Africa. It is relatively easy to sail from the Horn of Africa to Mauritania (as Juba says) because the prevailing winds and sea currents first carry the travelers towards the Cape of Good Hope; after that, the sea currents and prevailing winds support the voyage to Mauritania. With a modern sailing boat, this route can be sailed in less than 50 days (see p. 104–107). Based on this interpretation, the location of the promontory of *Lepteacla / Drepanum* could have possibly referred to the peninsula of South Africa. Both interpretations match with Philostratus according to whom the

¹¹⁰ This interpretation is supported by the potential etymological connection of the name Mossylum with the Sanskrit word *mausala*, which means “Shaped like a club”: the Cape of Good Hope matches relatively well the shape of a club.

¹¹¹ *Drepani* exist as an anthroponym in India. It is possible that the promontory of Drepanum originally received its name from a person called *Drepani*. It is a common process that the

name of person first converts to the name of a house (e.g. Drepani’s house), into a hamlet, into a village, and finally into a district or region. *Lepte* exists as an anthroponym in India, Nepal, Philippines, Congo, and Burkina Faso in West Africa.

¹¹² For a visual illustration of Strabo’s geography, see Encyclopaedia Biblica (1903), which shows Atlanticum as the sea that surrounds Africa and Eurasia.

Indians founded 60 cities to Sub-Saharan Africa 1550–1070 BCE (see p. 111).

India Maghreb connection: According to Polybius, Hannibal was using Indians in his army as elephant riders 218 BCE [Pol. Hist. 1.40.250]. This could indicate the migration of a very small amount of skilled professionals from India to Maghreb via the Middle East, but it is also possible that the Indians had arrived to Carthage around Africa, via West Africa where the Wolof language has a high amount of cognates with the Dravidian languages (see p. 118–115).

India – Western Europe connection: According to Herodotus, the Phoenicians sailed around Africa ~600 BCE, starting their journey from the Red Sea, and using two years to reach the Mediterranean Sea.¹¹³ This shows that such a journey was possible with the type of ships that used at that time. This interpretation is supported by Strabo, according to whom also some Persians had sailed around Africa from the Indian Ocean to Sicily ~300 BCE [Strab. 2.3.4]. Based on GAHAH data, it is likely that the route around the Cape of Good Hope would have been used already around 850 BCE (see p. 118).

According to Cornelius Nepos (110–25 BCE), an Indian tribe had sailed to Germania in order to do commerce.¹¹⁴ This piece of historical evidence can be combined with Strabo, Ptolemy, and Mela, according to whom the tribe of the *Indicetans* or *Indigetæ* lived in Iberia at the region of modern Catalonia.¹¹⁵ This tribe, which is also known as Indigetes or Indiketes, inhabited cities such as *Cinniana*, *Deciana*, and *Indika*.¹¹⁶ The word *Indika* means “From India” and *Indiketes* means “The ones who came from India”. This would indicate migrations from India to Iberia.

According to Titus Livius [Liv. 29], the Iberian chieftains *Indibilis* and *Mandonius* fought against Rome at the time when Hannibal attacked Rome. The other name of Indibilis was *Andobales*. The names *Indibilis*, *Mandonius*, and *Andobales* are

most common at the coasts of the Indian Ocean, which suggests that these names have an etymological connection to India. The following West European tribes have a name, which appears as an anthroponym most frequently or most densely in some African country, or at the coasts of the Indian Ocean: *Britons*, *Boii*, *Gaels*, *Gauls*, *Galatians*, *Lepontii*, *Iberians*, *Nuragi*, *Rhaetia*, *Camunni*, *Basque*, *Sican*, and *Elymia*. This suggests migration from India to Western Europe around Africa. This evidence, however, needs to be given low weight until a more systematic study of the geographic origin of the names of West European tribes has been performed.

The Irish and Scottish surnames *Doyle*, *MacDougall*, *McDougal*, *MacDowell*, and *McDowell* originate from the Gaelic name *Ó Dubhghaill*, which translates to “descendant of Dubhghall”. In Gaelic, *Dubhghall* means “Black stranger”.¹¹⁷ This suggests that dark skinned people would have immigrated to Ireland at some point of time. The dark skin would match with southern Indian or African immigrants.

According to Professor Hawkins (1965, 28), the surname *Dravidian* appeared already among the first historically documented Irish surnames. Although Hawkins did not provide a detailed reference to some historical document to prove his claim, the geographic distribution of anthroponyms that start with *Dravi* or *Travi* support migrations from India to Ireland around Africa or via Africa (Figure 12). This distribution, however, does not contain information of the likely time of these migrations. The only chronological conclusion that can be made is that the Dravid* name family has existed in India for a longer time than in other regions, as it has higher diversity in India than in any other region (see p. 63).

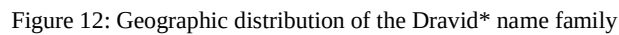
¹¹³ [Hdt. Hist. 4.43]; for a longer analysis of this source, see p.191.

¹¹⁴ Cornelius Nepos; quoted by Pliny the Elder [Nat. Hist. II.67] and by Pomponius Mela [Geog. 3.5]

¹¹⁵ “Indicetans” [Strab. 3.4.1 and 3.4.8]; “Indigetæ” [Ptol.2.6.19]

¹¹⁶ *Indika* has been mentioned only by *Stephanus of Byzantium* (Sanmartí & Santacana 2005).

¹¹⁷ Dictionary of American Family Names, 2nd Edition, 2022



According to GAHAH, the Scottish and Balochi populations have a 2.0% similarity. In addition, the people of the Orkney Islands have a 0.2–1.5 % genetic match with the Indian Jew, Brahui, and Kalash populations (see p. 129). GAHAH also offers data that suggests some early migrations around Africa. This data has been presented in Appendix table 2, according to which Kenya and South Africa acted as sources of immigrants for Morocco ~710 BCE, and for Iberia 542–234 BCE. Both of these migrations would have been maritime as it would have been very difficult and time consuming to walk from Kenya and South Africa to Morocco and Iberia. The difficulties would have been related to the long distance and challenging terrains, including the crossing of the Sahara desert.

The migrations around Africa or via Africa are supported by the studies of Shankarkumar et al. (2003) who studied the HLA system of the Nadar and by Ellis et al. (2000) who studied the HLA system of the Fulani. These studies show a high level of similarity in the HLA systems, which are so

¹¹⁸ Sources: [SciJinks](#) (retrieved 2022-09-25) and [Earth.nullschool.net](#) (updated in real time).

complex that chance resemblance would be very unlikely. This means that the similarity must have been produced by migration. Yet, these two studies provide no proof concerning the route or date of the

migrations. The GAHAH data and the HLA system related similarities have been illustrated into the migration map of Figure 13 (p. 118).

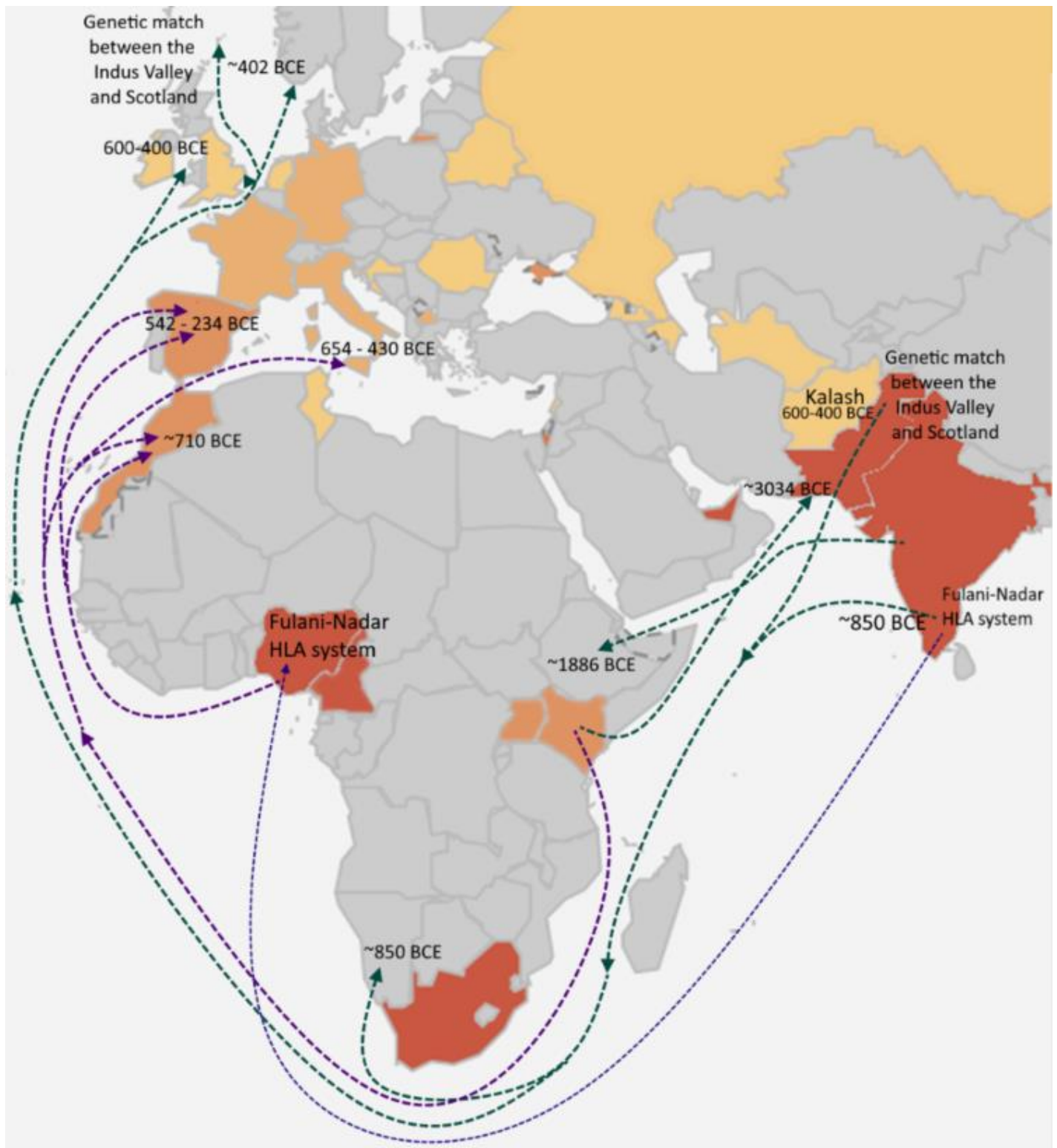


Figure 13: Migration corridor from the Indian Subcontinent to the British Isles around Africa

Archaeological and symbolic evidence

India – West Africa connection: According to Holl (2020,16), the use of iron metallurgy started in West Africa around 3000–2500 BCE, without evidence of a pre-existing bronze metallurgy. This indicates that the knowledge of iron metallurgy might have arrived from some other geographical region. According to Rajan (2023, unreliable), several iron objects have been discovered from Sivakalai in southern India, dated to 3000–2500 BCE. In this case, there would have been a preceding bronze metallurgy. These two findings open up space for a hypothesis, according to which iron metallurgy would have been first invented in southern India, from where it then spread to West Africa, Chad, and the Central African Republic.

The similarity of the Manding Script of West Africa with the Indus Script and Indian megalith pottery symbols indicates a cultural connection between West Africa and India. These similarities were analyzed in detail in Table 10 (p. 54) and the results suggest a cultural connection that would have occurred most likely 3000–1300 BCE, although the 1300–500 BCE is also possible. This connection would not have touched Egypt, as the Egyptian pottery symbols of the first dynasty deviate from the other symbol systems. Based on this, the *urheimat* of the Manding Script symbols may have been in India. Yet, this conclusion was made based on data of relatively weak quality.

According to Leroi-Gourhan & Poirier (1953), the war hatchets, daggers with ring-shaped hilts, and ankle rings of Togo have notable similarities to the ones from India.¹¹⁹ These similarities should be studied and quantitatively measured in order to see whether the similarities indicate a clear connection

between West Africa and India. According to Upadhyaya & Upadhyaya (1983), the Peuls of West Africa and Dravidians of India use the same techniques of dying, jewelry, and the making of metal weapons. In total, the archaeological evidence that supports migrations from India to West Africa seems only tentative, until it has been verified in additional studies.

India – Western Europe connection: According to Delvoye (2021), monumental megalith structures appear in Europe, Africa, Asia, Oceania, and America.¹²⁰ According to him, the dolmen-like monuments of Maghreb have simple funerary architectures, and resemble the *daga kofiya* megaliths of Ethiopia, which have been dated to ~1500 BCE. Similar dolmen-like monuments have not been found at other African locations. This could indicate migrations from Ethiopia to Maghreb via the sea route around Africa, assuming that the dolmen-like monuments of Maghreb could be dated to the end of the second millennium BCE. The time frame of the dolmen in Ethiopia matches with genetic evidence, according to which people from West India migrated to Ethiopia ~1886 BCE (GAHAH), and with the historical evidence that dates the Indian migrations to East Africa to 1550–1070 BCE [Life of Apoll. 3.20]. This means that the origin of these dolmen styles could be actually at the Indian Subcontinent. This hypothesis receives support from the fact that the biggest concentration of the Indian megaliths appears in Maharashtra (Western India), and is dated to the Indian Iron Age, 1500–500 BCE. Additional studies would be needed to check whether the Indian megaliths are older than the ones in Ethiopia, and whether the Ethiopian *daga kofiya* are older than the megalithic architectures of Maghreb. Without such a chronological order, inheritance of architectural

¹¹⁹ Leroi-Gourhan & Poirier (1953), referenced by Sengkor (1974)

¹²⁰ According to Delvoye (2021), the oldest African megalithic monuments have been found at Nabta Playa (Egypt), dating to the sixth millennium BCE. The related monolith features were common at the “African Cattle Complex” until the fourth millennium BCE. In Kenya, the monolithic traditions started during the third millennium, and consisted of 10-30 meter wide platforms containing impressive basalt monoliths. Smaller stone circles and cairns were sometimes adjacent to the main structures. At the Harar region

of Ethiopia, dolmen-like monuments with simple burials are dated to the second millennium BCE. Their morphology is similar to numerous funerary architectures in the Maghreb region. In Central Africa, one of the largest concentrations of megaliths is found between Central African Republic and Cameroon. The estimated dating of these megaliths varies, as some would date them to the first millennium BCE, and others to 2100 BCE – 1600 CE. At the Senegal-Gambia region, monoliths of only later times have been found, dating approximately to the 16th century BCE. In Madagascar, megaliths first appeared at the 18th century CE.

forms and styles from India to Maghreb would not be likely. In general, the archaeological evidence that connects India and Western Europe is weak.

Linguistic evidence

India – West Africa connection: According to a video, which has been edited and published by Thamilar Ulaham, the /*Mo-fud*/ people of Cameroon speak a language that contains words from the Tamil language. In addition, the video shows how some African place names have a meaning in Tamil.¹²¹ The potential Tamil loan words have been summarized in Table 28 below.

Table 28: Similarities between Tamil and Cameroonians

Word / concept	Language of the / <i>Mo-fud</i> /	Tamil
mountain that is deposited with sand	Mandura Mountains	man (“mountain”), thoor (“deposit”)
sorghum millet	solam	solam
ground soil	thara	tharai
dry (adj.)	barbara	varavara
catch, chase	puddi	puddi
It’s here	ingirku	ingirku
What is that	adhu yannama	adhu yannamang
black ant	malukotte	bal (black) kotti (sting); kotterumbu (stinging ant)

According to Homburger (1952, 1957, and 1964), the Dravidian languages share a significant amount of morphological features and vocabulary with the Senegalese and Mande languages of Africa.¹²² These similarities appeared, for example, between Dravidian languages and Peul and between Telugu and Mande.¹²³

According to N’Diaye (1977), “*Wolof, Pular, Serer, etc., should be classified as ‘Dravidoid languages’*

because they have emerged from some early Dravidian language.” All of the mentioned languages are spoken in West Africa. According to N’Diaye (1978), there are almost 500 cognates in Wolof and Dravidian.¹²⁴ Wolof is one of the Senegalese languages that are spoken in West Africa. If we assume that N’Diaye would have studied 2500–3000 concepts to find these 500 cognates and that these cognates would have appeared in one specific language or a very small language group (e.g. Kannada-Tamil), the Similarity of Wolof and this language or language group would have been 16.7–20.0% in year 1978. Based on the glottochronological equation (see p. 65), Wolof would have diverged from this Dravidian language or language group 2273–1841 BCE, which may be rounded to 2300–1800 BCE. This period indicates that Wolof would have diverged from Proto-Dravidian or Proto-South-Dravidian 2300–1800 BCE. If we reject the idea of a joint ancestral language for Wolof and the Dravidian languages, the 500 similar words should be treated as loan words that Wolof or some of its ancestral languages adopted after the immigration of a large group of Dravidian speakers to the region. Let us analyze this scenario based on two assumptions:

1. The similarity of Dravidian and this ancestral language was 50–60% in the beginning (after the immigrants had settled to the West Africa).
2. The similarity of these languages was only 16.7–20.0% in year 1978.

In this scenario, the decline of the Similarity Percentage would have been at least a decline from 50% to 20% and no more than decline from 60% to 16.7% (see chapter 3.7). When these values are converted to the C of the improved glottochronological equation, the migrations of Dravidian speakers to Senegal would have ended 1100–200 BCE. Due to the accumulation of unreliable assumptions and unconfirmed scenarios, it would be

¹²¹ “*Cameroonians Speak Tamil*” by Thamilar Ulaham, retrieved 2022-03-07.

¹²² Homburger (1952), referenced by Homburger (1977) and N’Diaye (1977); Homburger (1957 & 1964) referenced by Winters (2012b, 6)

¹²³ Homburger (1950) and Homburger (1951), referenced by N’Diaye (1977)

¹²⁴ N’Diaye (1978); referenced by Winters (2012b, 6)

necessary to re-examine carefully N'Diaye's list of potential cognates to verify the Similarity Percentage and to form a better estimate of the loss of contact between Wolof speakers and native Dravidian speakers. The review of N'Diaye's cognate list, however, is difficult as N'Diaye 1978 is not available in any major library.

According to Upadhyaya & Upadhyaya (1983), the Senegalese languages share a large amount of vocabulary and grammatical, morphological, and phonetical features with Dravidian. Table 29 below shows some examples of similar words, mentioning also their potential cognates in the Mande language.

Table 29: Similarities between Dravidian, Senegalese, and Mande (Upadhyaya & Upadhyaya 1983)

Word / concept	Dravidian	Senegalese	Mande
mother	amma	ama	ma
father	appan	ampa	ba
skin	uri	guri	guru
king	mannan	maansa	mansa
grand	biira	buur	ba
cultivate	bey	mbey	be
boat	kulam	gaal	kulu
feather	sooge	siige	sigi
mountain	kundru	tuud	kuru
stream	kolli	kal	koli

Out of these words, the word *cultivation* would date the arrival of the Dravidian influence after 3000 BCE when the cultivation fruits and melons begun in West Africa.¹²⁵ Another possible time would be the second millennium BCE when the variety of the cultivated crops increased (Manning 2010). However, the words *boat* and *stream* could fit equally well some later moment of time when people from an advanced seafaring culture would have migrated to West Africa (e.g. 850–230 BCE). The word *king* could suggest an even later period, such as the time of the construction of the first quarters of Old Oyo.

According to Sengkor (1974), the vocabulary relating to metallurgy and cotton spinning is the same in the Negro-African languages and in the Dravidian languages of India. The concepts listed by Senkor are presented in Table 30 below. These similarities suggest that the connection between Dravidian and Wolof would have appeared after the invention of iron in Western Africa or southern India around 3000–2500 BCE (see p. 119). The similarity of these words would also indicate that the knowledge of iron metallurgy might have migrated from India to West Africa or from West Africa to India approximately 3000–2500 BCE.

Table 30: Similarities of metallurgy and spinning related Dravidian and African words (Sengkor 1974)

African word and language	African meaning	Dravidian word and language	Dravidian meaning
<i>Xanjar</i> (Wolof)	bronze	<i>xancara</i> (Telugu)	work in bronze
<i>numu</i> (Bambara)	forge	<i>inumu</i> (Telugu)	iron
<i>kamara</i> (Wolof)	blacksmith's caste	<i>kamara</i> (Telugu)	blacksmith's caste
<i>eec</i> (Wolof)	producing yarn from raw cotton	<i>Ec</i> (Pengo)	to card cotton

According to Aravanaan (1976), there are ten common features shared by “Black African languages” and the Dravidian languages.

1. Simple set of five basic vowels with short-long consonants
2. Vowel harmony
3. Absence of initial clusters of consonants
4. Abundance of geminated consonants
5. Distinction of inclusive and exclusive pronouns in first person plural
6. Absence of degrees of comparison for adjectives and adverbs as distinct morphological categories
7. Consonant alternation on nominal increments noticed by different classes
8. Distinction of completed action among verbal paradigms as against specific tense distinction

¹²⁵ Baker, D. “The Origin of Agriculture in Africa”, retrieved 2022-05-05; to be replaced with a better reference.

9. Two separate sets of paradigms for declarative and negative forms of verbs
10. The use of reduplication for emphasis¹²⁶

These similarities suggest migrations between Sub-Saharan Africa and India, although the terminology of Aravanaan is outdated (“Black African languages”). In total, the linguistic evidence in support of the India – West Africa connection seems tentative (or moderate). Yet, this body of tentative linguistic evidence can be challenged by the following counter arguments:

Outdated and unverified sources: According to this argument, Homburger (1952, 1957, and 1964), Aravanaan (1976), N’Diaye (1978), and Upadhyaya & Upadhyaya (1983) are outdated sources, simply based on the publication years. Yet, it is necessary to note that research data does not change as fast as the theories and terminology that are used for interpreting the data. This means that the list of almost 500 similar words in Dravidian and Wolof is not likely to get outdated as fast as the language tree of the African languages, or the names of the language families. Yet, this criticism is valid to that extent that all the original sources should be carefully examined, and errors in data or methodology corrected in new studies.

Unconvincing proto-languages: According to this argument, two languages cannot be related to each other, unless one can prove with the methods of comparative linguistics that they originated from the same proto-language. As Homburger, N’Diaye, Upadhyaya & Upadhyaya, Sengkor, and Aravanaan have not demonstrated the existence of such a proto-language, the Dravidian languages cannot be connected to Wolof, Mande, and Basque. This argument, however, is a straw man as the India→Western Europe hypothesis does not claim that some Dravidian languages would belong to the same language family as some African or Western European languages. It is also possible that some African or European language would have loaned a large amount of Dravidian words without belonging to the Dravidian language family (see chapter 2.6).

False cognates: This is a variant of the *unconvincing proto-languages* argument. It is based on a strict and limited definition, according to which cognates are *two words that are related by descent from the same ancestral language*.¹²⁷ According to DH theory, the Similarity of two languages can be high, even if the languages would never have belonged to the same language family according to the strict language tree model that assumes that one language can have only one parent language (see p. 90). In order to avoid getting into the argument of false cognates, it is better to speak about lists of *similar words*, not about lists of *potential cognates*. These lists can be used as evidence of a cultural connection even if the compared languages do not belong to the same language family.

Chance resemblance: According to this argument, the identified potential cognates that seem to connect India and West Africa would have been caused by the independent emergence of similar words (that also have a similar meaning), in several regions in parallel and independently without any cultural contact. This argument is not very convincing when presented against the almost 500 similar words that N’Diaye (1978) detected in Wolof and Dravidian languages or against the long list of similarities identified by Lahovary (see p. 93 and 280). Although some similarities may be caused by chance resemblance, it is unlikely that they are all just coincidences.

Ethnic nationalism: According to this argument, N’Diaye, Upadhyaya & Upadhyaya, Sengkor, and Aravanaan are unreliable sources as they have a hidden nationalist agenda, which leads them to search for such evidence that would glorify the past of the Dravidians, or Indians in general. It is a valid argument that academic scholars may have ideological motives for their studies and conclusions. However, it is important to note that also western scholars may be biased by ideological memplexes such as racism, colonialism, and eurocentrism even without noticing it. Therefore, all critics of the given linguistic sources should ask themselves, whether

¹²⁶ According to Aravanaan (1976),; referenced by Winters (2012b, 6); original source to be checked.

¹²⁷ Merriam-Webster, [definition 3a](#).

their suspicion against Indian sources is partly motivated by racism or by the belief that all significant cultures have developed in the Middle East or at the coasts of the Mediterranean Sea.

In total, the linguistic evidence that connects India and West Africa seems to be *tentative (or moderate)* as there are many sources that report lexical, grammatical, or morphological similarities between Dravidian and West African languages or between Dravidian and Western European languages. The credibility of the evidence would be increased in word list comparisons, in which the list is a Swadesh list or a systematic sample of words from a specific sector of culture. Proper sampling would reduce the probability of cherry picking and the over-emphasis on similarities that have been caused by chance resemblance.

India–Africa–Western Europe connection:

According to chapter 3.8, the high similarity of the Basque language with the Kannada and Tamil languages of India and the low similarity of Basque with other Dravidian languages suggests that Proto-Basque would have received a large amount of Proto-Tamil-Kannadan loan words 1500–500 BCE. Although the similarity figures would need to be validated in additional studies, the amount of similar words is relatively high. This indicates notable migrations from India to Iberia unless one can show that the similarities would have been caused by descent from a shared ancestral language or by the migration of the similar words to Basque via some intermediate languages.

According to Rouard (2004, 38–39), French contains 113 words that resemble Dravidian words. He interprets these words as potential cognates that would have descended from an ancient Trans-Eurasian proto-language. Yet, an alternative explanation is that these words were loaned from Dravidian languages to French much later. This interpretation matches with the migrations around Africa. In addition, there is some weak evidence concerning the lexical connection of the Etruscan language with Dravidian (see p. 137). Yet, the total linguistic evidence for the India–Africa–Western Europe hypothesis seems only *tentative (or weak)*.

Cultural evidence

According to Upadhyaya & Upadhyaya (1983), several Indian, African, and Western European cultures share the ancient matriarchal system of inheritance in which property is inherited from mother to daughter: Dravidians of Kerala and South Kanara, the Basques of Pyrenees, the Berbers of Sahara, and many communities of Negro-Africa. If this observation could be verified from other supporting sources, it would provide relatively strong support for the India–Africa–Europe theory, as such matriarchal inheritance system seems to be rare in the Middle East and in the central and Eastern Europe. In addition, there is a distinct similarity between Dravidian India and Africa in the worship of serpents: In the Western Coast of South India the dead body of a serpent is cremated with funeral rites, and among many African indigenous peoples it is buried with ritual formalities (*Ibid.*). If one could show that such rituals have not existed in Middle East, Balkans, and Eastern Europe, this would indicate that the worship of serpents would have been an Indo-African phenomenon. This would suggest direct migration from India to Sub-Saharan Africa.

According to Caesar, the Britons were civilized people who dressed in colorful and patterned clothing and who used war chariots very skillfully [DBG 5]. This could be interpreted as (very) weak evidence concerning a potential cultural connection from Africa to Britain, as the colorful and patterned clothes are especially common in Africa.

Old traditions and unreliable sources

A relatively large body of old traditions and unreliable histories that match with the early Indian presence in East Africa was already presented in chapter 4.4. The following traditions and histories relate more specifically to the Indian presence in West Africa and Western Europe. Critical readers may wish to jump over this section to page 125.

Strabo and Megasthenes: According to Strabo “Some say that the Mauretanians are Indians who accompanied Hercules hither” [Geog. 17.160]. According to Megasthenes, the Indians of the

Maurya Empire valued a legend, according to which King Hercules of India *traversed all sea and land* at the time when the first cities were built to India [Arr. Indic. 8]. Both of these stories could be interpreted as weak evidence concerning the Indian origin of some African peoples. Both would date the migrations to the early Bronze Age.

Family tradition of Mbengue: According to Thierno Amath Mbengue, the Lebu family *Mbengue* (/mbeng/) came from Bengal (North East India), and their name is derived from *Bengal*.¹²⁸ The Lebu people live in Senegal where the Wolof language seems to have adopted almost 500 loan words from Dravidian languages.

Homer's Odyssey: According to Baikouzis and Magnasco (2008), there is reason to believe that Odysseus (Ulysses) was a historical person who lived around 1178 BCE. When this hypothesis is combined with the India→Africa→ Western Europe hypothesis, it is possible to interpret Odysseus as an Indo-African hero. This interpretation is supported by the following passages of Odyssey.

1. When returning home from the Trojan War, Odysseus was frequently sailing on the Oceanus, which means the sea that encircles Africa and Eurasia [Hom. Od. 12].
2. During his sea voyage, Odysseus was in contact with the *Far-off Aethiopians*, meaning the dark-skinned Sub-Saharan Africans. He also made contact with the Phaecians who lived at the extreme end of Aethiopia [Hom. Od. 5]. *Extreme end* would mean the opposite side of Africa, looking from the Mediterranean point of view. The forename *Fecia* is still most common in Nigeria although it appears also in South Africa.
3. According to Homer, Aethiopians were divided into two halves: one looking east and the other one looking west [Hom. Od. 1.20]. This suggests that the Ancient Greeks would

have inherited the story of Odysseus from the Mycenaean Greeks, who would have known that Africa is a long continent that has one part facing east, and the other part facing west. This knowledge of the shape of Africa would then have been erased by the Late Bronze Age collapse.

4. At ancient times, there was a tradition of first founding cities to the shores of the Indian Ocean and then founding cities with the same name to the Mediterranean region.¹²⁹ This suggests that there would have been *Ithaca* and *New Ithaca*. The older *Ithaca* might have been located at the Indian Ocean (e.g. Socotra), and the *New Ithaca* would have been located in Greece. The names *Ithaca* and *Itaka* appear most frequently as anthroponyms in India and in Sub-Saharan Africa.
5. Homer describes how Odysseus, during his journey, met Calypso who was the daughter of Atlas. According to Apollonius of Rhodes, Calypso lived next to *Melite*, *Cerossus*, and *Nymphaea*, and next to a mountain of Thunder.¹³⁰ The names *Melite* and *Nymphaea* still appear as anthroponyms at the coasts of the Indian Ocean, which suggests that the story of Atlas and Calypso might have originated from the coasts of the Indian Ocean.
6. After meeting with Calypso, Odysseus sailed forward, and almost lost his courage at a place where the winds from all directions clashed [Hom. Od. 5.295]. This description matches with the Cape of Good Hope where the friendly northeastern winds meet with the strong westerlies.¹³¹
7. The forename *Odysseus* is most common in the Philippines, India, Iraq, and Nigeria, and the surname Odysseus is most common in Israel, Malaysia, and Nigeria. This suggests that Odysseus would not have been originally a Mediterranean character.

¹²⁸ Thierno Amath Mbengue, referenced by N'Diaye (1977)

¹²⁹ Sidon and Tyre, for example, first existed at the shores of the Indian Ocean, and later on at the Mediterranean region.

¹³⁰ Apollonius of Rhodes [Argonautica I].

¹³¹ The westerlies of the southern hemisphere are strong between May–September, and mild during November–March. Once this yearly cycle is known, the Cape of Good Hope can be passed without problems from the east to west.

Iliad: According to Homer, Hera once said, “*For I go to see the ends of the bountiful earth, Oceanus source of the gods and Tethys divine their mother.*” [Iliad 14.200-201] This means that the Greek gods would have originated from the sea that surrounds Africa and Eurasia. This can be interpreted in two ways: 1) The stories of the gods originated from the shores of Oceanus, or 2) the Greek gods were originally humans who inhabited the shores of Africa or Eurasia, and who were then exaggerated to a divine position by later generations. Both interpretations locate the origin of the Greek gods outside the Mediterranean region.

Marsh Tritonis: According to Greek mythology, Heracles and the Argonauts traveled sometimes at the Atlantic Ocean [[Argon.1](#)]. At one point of their travels, the Argonauts entered Marsh Tritonis. When they tried to return to the sea, they could not find their way out of the marsh. This marsh has a speculative match with the giant Lake Chad, which was turning into a marsh after 3000 BCE.

Atala: According to a Berber tradition, the ancestors of the Berbers are *sons of the source, Atala* ([Joseph 2005, 32](#)). There is still a river called *Atala* in Cameroon and a locality called *Atala* in Chad. This indicates migrations from the Cameroon-Chad region to Maghreb. This interpretation is supported by ancient African traditions, according to which King Atlas of tropical West Africa conquered large areas of land in the northwestern part of West Africa [[Diod. Libr. Hist. III.54.1](#)]. The anthroponym *Atalas* is most common in Pakistan, and the village of *Atala* still exists in Uganda. Based on this piece of weak

evidence, there is a potential connection from the Indus Valley to West Africa and Maghreb.

In addition, there are some other unreliable sources, which might offer a potential connection to the Indian migrations towards Western Europe. They are only given in footnotes due to their lower significance and reliability.¹³²

Disaggregation of the India → Africa → Western Europe hypothesis

The purpose of this section is to break down this migration corridor to shorter sub-corridors and to summarize the already given evidence for each of them. In general, all the shorter migration corridors can be used as evidence for the longer ones. For example, the India → East Africa corridor 3000–1070 BCE can be used as evidence for the India → West Africa corridor 3000–220 BCE, which can be used as evidence for the India → Maghreb corridor 1500–220 BCE. This is partly because the shorter corridors show that the migrants that were heading for more far-away destinations would have known the main part of the route, and would have possibly been supported by friendly colonies along the way.

India → East Africa hypothesis: According to this hypothesis, *there were several migration waves from India to East Africa 3300–500 BCE* (p. 109). The evidence that supports this hypothesis has been classified as *moderate or strong* in chapter 4.4 (p. 114). After the colonialization of East Africa, the migrations most likely continued as far as Namibia based on GAHAH data, which indicates migrations from India to Namibia around 850 BCE.

¹³²**Chartres:** According to Autran (1935, 112), the tradition of worshipping the Black Virgin in Chartres and Marseilles originated from a group of sailors who came to these areas, and was based on the Indian tradition of worshipping the goddess Kali. In addition, Autran notes that the calendar in the Tamil culture starts in April, and so does the calendar in the Cathedral of Chartres. These similarities could indicate a connection between India and France. However, the reference to Autran was obtained from Pathmanathan (1979, 26), who sometimes provides inaccurate, misleading, and unreliable references (see p. 132).

Saptadvīpa Vasumatī: According to Śiva Purāṇa (II.2.35) and Varāha Purāṇa (LXXIV), Indian kings once ruled the Saptadvīpa Vasumatī, which means the seven continents, islands, or peninsulas of the world. Although these dvīpas

have sometimes been considered as equal to the seven continents of the world, Saptadvīpa Vasumatī describes the continents as concentric rings of land that were separated by concentric oceans. According to older Vedic texts, there were only four continents, which were separated from each other by the mountain Meru. This version could possibly have some connection to real geography, as the Himalayas can be seen as one almighty mountain that divides Eurasia into four subcontinents. In this older version, which was dominant until approximately 500 BCE – 400 CE, the Indian rulers of these four continents were not mentioned.

India → West Africa hypothesis: According to this hypothesis, *Indians founded a colony into tropical West Africa 3000–2500 BCE or 1550–100 BCE.*

The evidence that supports this hypothesis has been presented on pages 115–125, and a summary is presented in Table 31 (p. 126).

Table 31: Summary of the evidence concerning the migrations of Indians to West Africa 3000–50 BCE

#	Type of evidence	Central evidence	Strength of evidence
1	Genetic (p. 117)	The Fulani of West Africa have a similar HLA system as the Nadar of India. GAHAH shows a migration corridor from the Indian Ocean to Namibia ~850 BCE, and to Morocco ~710 BCE. This indicates migrations to West Africa approximately 850–710 BCE.	Moderate (or tentative)
2	Linguistic (p. 120–123)	The Wolof language of Senegal and Mauritania contains approximately 500 similar words as Dravidian languages (N'Diaye 1978). Wolof should be classified as a Dravidoid language (N'Diaye 1977). According to Homburger (1952, 1957, and 1964), the Dravidian languages share a significant amount of morphological features and vocabulary with the Senegalese and Mande languages of Africa. According to Upadhyaya & Upadhyaya (1983), the Senegalese languages share a large amount grammatical, morphological, and phonetical features, and vocabulary with the Dravidian languages. The vocabulary relating to metallurgy is the same in the Negro-African languages and in the Telugu language of India (Sengkor 1974). The language of the Mo-food people of Cameroon contains at least 6 words that have the same form and meaning as a Tamil word.	Tentative (or moderate)
3	Onomastic	According to Thierno Amath Mbengue, the Lebu family <i>Mbengue</i> (/mbeng/) came from Bengal (South East India), and their name is derived from <i>Bengal</i> (N'Diaye 1977). There is a town called <i>Benguela</i> in Namibia close to the place that received Indian immigrants ~850 BCE according to GAHAH. This suggests that the immigrants would have arrived from the vicinity of the Bengal Bay in India.	Tentative
4	Historical (p. 115)	Based on the description of Juba of Numidia, there was an Indian colony in South Africa or in West Africa still around 50 BCE [Plin. Nat. Hist. II.34.97].	Tentative
5	Archaeological (p. 119)	The war hatchets, daggers with ring-shaped hilts, and ankle rings of Togo have notable similarities to the ones from India (Leroi-Gourhan & Poirier 1953). According to Upadhyaya & Upadhyaya (1983), the Peuls of West Africa and Dravidians of India use the same techniques of dying, jewelry, and the making of metal weapons. The similarity of the Manding Script of West Africa with the Indus Script indicates a cultural connection between West Africa and India 3000–500 BCE (p. 119). Iron metallurgy appeared in Southern Chad and West Africa around 3000–2500 BCE without a preceding bronze metallurgy (Holl 2020, 16). On the other hand, according to Rajan (2023), a large quantity of iron objects, dated to 3000–2500 BCE, have been found in Sivakalai in southern India. This suggests that southern Indians might have brought iron metallurgy to West Africa 3000–2500 BCE.	Tentative
6	Indirect	There is <i>moderate or strong</i> evidence that supports migrations from the Indian Subcontinent to East Africa and Namibia 3200–850 BCE (p. 114), and <i>tentative (or moderate)</i> evidence to support the India → Western Europe hypothesis (p. 128). This combined body of evidence supports also the India → West Africa hypothesis.	Tentative
7	Old traditions	A large body of old legends and traditions matches with the India → West Africa hypothesis (p. 123).	Very weak
Total evidence			Moderate (or tentative)

The genetic evidence concerning the HLA system proves the migration of people from India to West Africa without clarifying a route and date, whereas the GAHAH evidence shows a route and dates the migrations without showing that the migrations would have originated from India. This sums up as moderate (or tentative) evidence. When this is combined with the tentative (or moderate) linguistic

evidence, the total evidence can be summed up as moderate (or tentative).

India→Maghreb hypothesis: According to this hypothesis, *Indian migrants arrived to Mauritania and Maghreb 1550–200 BCE via the route around Africa*. This hypothesis is supported by a relatively limited set of cross-scientific evidence, which has been summarized into Table 32 below.

Table 32: Summary of evidence for the Indian migrations to Mauritania and Maghreb 1550–200 BCE

#	Type of evidence	Central evidence	Strength of evidence
1	Linguistic (p. 118)	N'Diaye (1978) identified almost 500 similar words in the Wolof language (Senegal and Mauritania) with the Dravidian languages (India).	Tentative
2	Historical (p. 115)	Hannibal used Indians as elephant riders 219 BCE when he attacked Rome [Pol. Hist. 1.40.250]. This could indicate a small colony of Indians at the Maghreb region.	Tentative
3	Indirect	The moderate (or tentative) evidence that supports the India→ West Africa hypothesis supports also the India→Maghreb hypothesis.	Tentative
4	Genetic (p. 117)	GAHAH data shows migrations from India to Namibia ~850 BCE. In addition, it shows migrations from Kenya to Morocco ~710 BCE, to Sicily 654–430 BCE, and to Spain 542–234 BCE (see p. 118). This shows that migrations around the Cape of Good Hope occurred already 850–234 BCE.	Tentative
Total evidence			Tentative

The evidence, in total, has been rated as *tentative*. The upgrading of this evidence rating to moderate would require a critical review of the ~500 potential Dravidian loan words that N'Diaye (1978) identified in the Wolof language of Senegal and Mauritania.

India→ Africa→ Western Europe hypothesis: According to this hypothesis, *a large group of Dravidian speakers sailed to West Africa at some point of time 1500–500 BCE and to Western Europe 1500–200 BCE*. A summary of supporting evidence has been presented in Table 32 (p. 127).

The strongest evidence comes from historical sources, which describe Indian colonies in the

Atlantic side of Africa, in Iberia, and in Germania. This tentative (or moderate) evidence is then supported by additional cross-scientific and linguistic evidence. The lack of a solid and well-dated genetic connection from India to Maghreb and Western Europe can be used as an argument against the hypothesis. Yet, the hypothesis does not require the migration of genetic Indians to Iberia or to Britain, as it refers to Indo-Africans and not to genetic Indians. Based on these considerations, the total strength of evidence has been rated as *tentative (or moderate)*.

Table 33: Evidence for the migrations of Indians or Indo-Africans to Western Europe around Africa 1500–200 BCE

#	Type of evidence	Central evidence	Strength of evidence
1	Historical (p. 115)	According to Philostratus, Indians founded 60 cities to Sub-Saharan Africa 1550–1070 BCE (see p. 111) According to Juba of Numidia (~50 BCE), there was an Indian colony at the Atlantic side of Africa [Plin. Nat. Hist. II.34.97]. Hannibal used Indians as elephant riders when he attacked Rome ~219 BCE [Pol. Hist. 1.40.250]. According to Cornelius Nepos, a group of Indians sailed to Germania before 50 BCE and established a kingdom there (Plin. Nat. Hist. II.67, Strab. Geog. 3.5).	Tentative (or moderate)
	Onomastic (p. 115)	According to Strabo, Ptolemy, and Mela, the tribe of the <i>Indicetans</i> or <i>Indigetæ</i> lived in Iberia, and according to Stephanus of Byzantium, one of their cities was called <i>Indika</i>. According to Titus Livius, the Iberian chieftain <i>Indibilis</i> fought against Rome around 220 BCE [Liv. 29]. The names <i>Indicetans</i>, <i>Indigetæ</i>, <i>Indika</i>, and <i>Indibilis</i> suggest a connection to India. In addition, several ancient European tribes had a name that is currently more common as an anthroponym in India than in Europe. Some Irish surnames such as <i>Doyle</i> mean “Black stranger”. According to Hawkins (1965, 28), the surname <i>Dravidian</i> appeared among the first historically documented names of Ireland. Although Hawkins seems like an unreliable source, the geographic distribution of the Dravid* name family supports his claim: This name family appears as an anthroponym mostly in India, Sub-Saharan and Western Africa, and in Western Europe (Iberia, Italy, and Britain).	
2	Genetic (p. 117)	GAHAH shows a migration corridor from the Indian Ocean to Namibia ~850 BCE, to Morocco ~710 BCE, to Iberia 542–234 BCE, and to the British Isles 598–402 BCE, and from Indus region to the North Sea region 600–400 BCE.	Tentative
		The Fulani of West Africa have a similar HLA system as the Nadar of India. This is strong evidence of migrations, but does not specify their date or route.	
3	Indirect	There is moderate or strong evidence that supports migrations from the Indian Subcontinent to East Africa 3200–900 BCE (p. 114), and moderate (or tentative) evidence to support the India → West Africa hypothesis (p. 126). In addition, there is tentative evidence to support the India → Maghreb hypothesis (p. 127). This combined body of evidence supports also the India → Africa → Western Europe hypothesis.	Tentative
4	Archaeo-logical (p. 119)	Several confirmed but undated similarities of archaeological features connect India and Britain (p. 131). There are many unconfirmed similarities in the style and form of the artefacts and archaeological features in India and West Africa (p. 119)	Weak or tentative
5	Linguistic (p. 120)	Basque has a 5–14% similarity with Tamil and Kannada based on Lahovary (1963). This suggests that Proto-Basque and Proto-Tamil-Kannada would have had a heavy contact with each other 1500–500 BCE (see 3.8). In addition, there are at least 113 similar words in French and Dravidian (Rouard 2004, 38–39). The similar words in the Dravidian and West African languages suggest migration of Dravidian speakers from India to West Africa, Iberia, and France along the sea route around Africa.	Weak or tentative
Total evidence			Tentative (or moderate)

4.6 India → British Isles hypothesis

According to this hypothesis, *notable amounts of migrants from the Indian Subcontinent arrived at the British Isles 3000–50 BCE*. This hypothesis does not yet specify the route of migration, as the route-specific evidence is presented separately in chapter 4.4–4.5 and 4.7–0. In addition, it does not specify whether there would have been one single migration wave or several smaller migration events.

Genetic evidence

According to GAHAH, immigrants arrived to the British Isles from Eastern Afghanistan in one or two migration waves 600–400 BCE. The aggregated range of 95% confidence for these migrations is 710–206 BCE (see p. 143). The GAHAH populations that indicated migrations from the Indus region to the British Isles are the following:

1. Kalash who are a small cultural minority at the borderlands of Pakistan and Afghanistan
2. The populations of people who currently inhabit Ireland, Wales, Scotland, and Orkney Islands

The genetic similarity between the Kalash and the Scottish is 23.1%, which is much higher than the second highest similarity, measured between the Kalash and the Lithuanian population (5.0%). Although the migrations between the Kalash and the British Isles were marked as multiway in GAHAH, it is possible that the migrations from India to Britain would have been only a counter-current, whereas the main flow of migrants would have been from Northern Europe towards India. It is also possible, that the similarity of the Kalash and the Scottish populations is caused by migrations from Northwestern Asia to Afghanistan and Scotland.

In general, the populations of the British Isles have a relatively low similarity with the populations of the Indus Valley. The Scottish and Balochi populations have a 2.0% similarity, and the Scottish and Indian Jew population 0.1%.¹³³ In addition, the

people of the Orkney Islands have a genetic match with the following Indian or Indus Valley populations: Indian Jew (1.5%), Brahui (0.3%), Kalash (0.2%), Burusho (0.2%), and Balochi (0.1%). Similar but weaker connections appear also between the Irish, Welsh, and English populations with the populations of the Indian Peninsula. This suggests that the volume of migrations would have been comparable to several small fleets of ships carrying no more than 30–300 migrants, although the scenario of one single bigger fleet of 500–1000 migrants is also possible. The genetic similarities between Indus region and the British Isles cannot be explained by modern migrations, as there is a higher similarity between Scotland and the Indus region than between England and the Indus region. (Modern migrations from India to the British Isles have been directed more to England than to Scotland.)

The connections of the Kalash to Western Europe have also been questioned. According to Ayub et al. (2015), the Kalash would have diverged from an ancient Asian population approximately 12,000 years ago, with no evidence of more recent admixtures from Europe. Yet, this argument relates to the ancient origin of the Kalash based on cluster analysis and therefore does not refute the potential migrations of the people from Eastern Afghanistan or from the northern parts of the Indus Valley to Scotland 710–206 BCE.

Linguistic evidence

Basque: According to chapter 3.8, Basque language and the Tamil-Kannada language group have a relatively high similarity, whereas the similarity of Basque to the other Dravidian languages is much lower. This suggests that Proto-Basque would have diverged from to Proto-Tamil-Kannada around 1500–500 BCE after the mixing of the local Iberian population with Indian immigrants (see p. 93–95). Although the similarity figures and divergence times would need to be validated with additional studies, the amount of similar words in Basque and

¹³³ According to GAHAH, the people of the Scottish sample had a 2.0% match with the sampled Balochi people.

the Tamil-Kannada language group is so high that it indicates notable migrations or an active trade route from India to Iberia. As the Basque country is relatively close to the British Isles, a connection between the Basque country and India could possibly indicate a connection also from India to the British Isles. This interpretation is supported by the relatively high similarity of the Welsh and Scottish populations with the Basque population in the GAHAH data.

Onomastic evidence

According to Hawkins (1965, 28) one of the first Irish surnames was *Dravidian*, but he did not provide any reference to some historical sources that would have confirmed his claim. In addition, the credibility of Hawkins as a scholar of history is reduced because he was a professor of astronomy and not of history, archaeology, or linguistics. If the early appearance of the surname *Dravidian* could be confirmed, it would act as strong evidence for ancient migrations from India to Ireland. Partial support for Hawkins is provided by the geographic distribution of the *Dravid** name family (p. 117).

Pathmanathan: Migrations from India to Western Europe and the British Isles are supported by Dr. Pathmanathan of the University of London, who provides a relatively large set of Tamil words, which appear as place names in Western Europe and in the river valleys that reach from the Atlantic to Central Europe. According to him, the Tamil word for “River” is *Aru*, which appears in the name of the Swiss river *Aar* (Pathmanathan 1979, 5). In addition, there is *River Arun* in southern England. This might create a connection from India to England. According to Pathmanathan, the Tamil word *Makan* (“son”) appears in Scottish as *Mac*. The Tamil word for “Coast” is *Oram*, which appears in the Gaelic language as *Earramh*. In addition, there was a place called *Yccanora* in Sussex, England, which seems to have meant “Yacca’s

shore” (Ibid, 5). The Tamil word *Kappal* (“ship”) appears in the North Frisian language in the form of *Skapp* (Ibid, 5).

According to Pathmanathan (1979, 29), the following Druidic names originate from India: *Madan*, *Muirgen*, *Murugan*, *Morgan*, *Mongan*, *Manannan*, *Anmann*, *Tennisan*, *Tennyson*, *Callaghan*, *Taliesin*, *Taliesingam*, *Conn*, *Conroy*, *Ness*, and *Nesan*. According to him, this indicates a Dravidian origin of the Druidic culture. Yet, the onomastic study of chapter 5.11 provided only weak or tentative support for this conclusion (p. 196). Pathmanathan (1979, 42) also claims that the following Scottish place names are “pure Tamil”: *Annan*, *Arinangun*, *Cara*, *Conan*, *Conagan*, *Copay*, *Inchture*, *Linga*, *Panmure*, *Oncan Raasay*, *Rachan*, *Ramsay*, *Rathven*, *Urr*, and *Tirie*. According to him, this same applies also to the Irish place names *Racavan* (*Rathcoon*), *Ramoan* (*Rathmorán*), *Ballinagore*, *Killala*, *Aghavallin*, *Omey*, *Ballisumbaghan*, and *Athenassy*. Some of these place names are so long that they would be unlikely to appear independently at different regions (e.g. *Ballisumbaghan*, *Aghavallin*, and *Arinangun*). This means that the similarities must have originated from a cultural connection, even if the list of similarities might have been produced by cherry picking. The problem of this evidence is that Pathmanathan is not a very reliable source.¹³⁴

Wiktionary: According to Wiktionary, many English surnames originate from Dravidian languages.¹³⁵ The amount of English surnames that have been adopted from five different Dravidian languages has been summarized in Table 34 below, and the detailed name list is shown in Appendix table 51. Whereas the migration of loan words may occur just based on cultural contacts and word loaning, Dravidian surnames would be unlikely to migrate without the migration of people. The problem of this evidence of migrations is that it does not provide information of the time of migrations.

¹³⁴ In some cases, Pathmanathan bases his argumentation on very old sources, which did not contain any information to support his claims. For example, according to Pathmanathan, Mitra (1923, 282) and Gomme (1880, 75) have demonstrated that the technologies of copper metallurgy and the terrace cultivation methods of India were similar to the ones in Ireland

and England. Yet, these sources do not contain any information of these topics.

¹³⁵ Wiktionary: [English surnames from Dravidian languages](#).

This means that the names may have migrated to Britain also after the ancient times.

Table 34: English surnames that originate from Dravidian languages (Wiktionary)

Dravidian language	Main location of speakers	Amount of English surnames that originate from this language
Telugu	Southern India	49
Tamil	Southern India	34
Malayam	Southern India	24
Kannada	Southern India	6
Total		67

Archaeological evidence

According to Das (2018), many artefacts and megalithic features show similarities between Western Europe and India. These similarities include the following:

1. Similarity of the “bullaun” stone of Templebryan in Ireland with the Indian “mortar” stones, and the similar beliefs that deemed these stones sacred (p. 5)
2. Similarity of the perforated/holed stone of Totterdown in Britain with the perforated / holed stone of the Punkri Burwadih megalithic complex in India (p. 6)
3. Similarity of the one sided animal head at the entrance to West Kennet Long Barrow in Britain (dated to 3600 BCE) with the one sided lizard head at Banadag in Jharkand in India
4. Similarity of the propped stone structure in Pembrokeshire in Wales and the structures of Purni Mandar and Rahriya Tand in India (p. 7)
5. Similarity of the Chun Quoit megalith of Cornwall with the Mushroom Stone of Kerala (p. 7)
6. Similarity of the pecked concentric circles of Heygate Stone, the Ballochmyle Walls, and Achabreck (Britain and Ireland) with the Neolithic concentric circles in Sopore (India)
7. Similarity of the position of the megaliths of Britain and India in comparison to the sunrise

and sunset during the equinoxes and solstices (p. 9)

The problem of these similarities is that megaliths are very difficult to date, unless ceramics or organic materials are found in associated contexts, so that the dating of the megaliths could be based on the radiocarbon method or other similar natural scientific methods. In the absence of dating evidence for the Indian megaliths, it is impossible to know whether the tradition of constructing megaliths would have spread from Europe to India or vice versa, or from some other region to Europe and India.

The observations of Das receive tentative support from Professor L.A.K. Iyer (1967), according to whom the prehistoric English cairns and cists are similar to the cairns and cists encountered in Nilgiri, Malabar, and Carnara in southern and southwestern India. The value of Iyer (1967) as evidence of migrations is reduced, as he did not provide detailed description of these similarities and as he did not tell the dating of the artefacts and features that were claimed similar.

Historical and cultural evidence

According to Cornelius Nepos (110–25 BCE), the proconsul of Gaul received a present from the king of the Suevi who had sailed from India to Germania in order to do commerce.¹³⁶ As this historical source did not mention the route of sailing, it can be treated as general evidence concerning the connection between India and Germania. As Britain is close to Germania, it is likely that the sailors who knew the route from India to Germania would have also known the way from India to the British Isles. Although it might sound incredible that Indians would have sailed all the way to Germania and Britain, it must be noted that several parties navigated around Africa already 600–400 BCE (p. 101).

According to Sharkey (1975, 82), “the customs of hanging cloodies in trees or bushes by a sacred well was once widespread throughout Scotland, Wales

¹³⁶ Cornelius Nepos, who was quoted by Pliny the Elder [*Nat. Hist.* II.67] and by Pomponius Mela [*Geog.* 3.5]

and Ireland”, and this custom was also common in India and Sri Lanka.

Unreliable sources

According to Pathmanathan (1979, 56), the tradition of *offering milk to the gods on top of a flat stone every Sunday* appears in one of the islands close to Harris (Scotland), and also among the Dravidian culture. In addition, according to him, the British had a habit of polyandry at the times of Julius Caesar and this somewhat rare habit has been found in Sri Lanka and Malabar in southwestern India (Ibid, 30). This would suggest a potential cultural connection. According to Pathmanathan (1979), some Roman sources report that the Druids came to the British Isles by seas, and only later on expanded their influence to continental Europe. This matches with the old Irish traditions that have been documented to *Lebor Gabála Érenn*, according to which some notable ancestors of the Irish people came to Ireland

with 50 ships. According Hawkins, some Irish legends tell about “*a seventh group of invaders – the Dravidians from India*”. This note appears in (Hawkins 1965, 31), but a more detailed reference to these Irish legends is not given. The tendency of Pathmanathan (1979) and Hawkins (1965) to provide weak references like *some Roman sources report* or *some Irish legends tell* reduces their overall credibility.

According to Guha (2021), the *Danavas* of the Vedic literature might have a connection to the “children of Danu” of the Irish mythology. This link, however, is only a very speculative one.

Evaluation of supporting evidence

According to the India – British Isles hypothesis, *notable amounts of migrants from the Indian Subcontinent arrived at the British Isles 3000–50 BCE*. The supporting evidence has been summarized to Table 35 (p. 132).

Table 35: Summary of the evidence for the Indian Subcontinent → British Isles migrations 3000–50 BCE

#	Type of evidence	Central evidence	Strength of evidence
1	Indirect	There is tentative (or moderate) evidence in support of migrations from India to Western Europe. This indicates migration also to the British Isles.	Tentative
2	Genetic (p. 129)	The British Isles received migrations from the Indus region in two migration waves approximately 600–400 BCE, range of 95% confidence being 710–206 BCE. The genetic similarity between the Scottish and the Kalash is 23.1% (high).	Tentative (or weak)
3	Historical (p. 131)	According to Cornelius Nepos, a group of Indians sailed to Germania before 50 BCE and established a kingdom there (Plin. Nat. Hist. II.67, Strab. Geog. 3.5). As the route to Germania would have passed the British Isles, migrations to Britain may have occurred equally well.	Tentative (or weak)
4	Onomastic (p. 130)	According to Hawkins (1967), one of the early surnames in Ireland was Dravidian. The geographic distribution of the Dravid* name family supports his argument. At least 67 English surnames have originated from India (Wiktionary). Six ancient Scottish anthroponyms, 15 Scottish place names, and 8 Irish place names have a Dravidian origin (Pathmanathan 1979). Several place names in Western Europe seem to originate from the Tamil language (Ibid.).	Tentative (or weak)
5	Archaeological (p. 131)	The rock carvings (game boards), bullaun stones, perforated stones, one sided animal heads, and megaliths of Britain and Western Europe have equal counterparts in India (Das 2018). The similarities, however, have not been dated.	Weak or tentative
6	Customs (p. 131)	The customs of hanging clooties in trees or bushes by a sacred well was once widespread throughout Scotland, Wales and Ireland, and still appears in India and Sri Lanka (Sharkey 1975, 82).	Weak or tentative
	Traditions	Various unspecified traditions, myths, and legends that offer speculative interpretations.	Zero
Total evidence			Tentative (or weak)

The total strength of the evidence that supports migrations between the British Isles and the Indus Region can be summed up as *tentative*. The archaeological similarities between India and Britain would date the connection to 3000–1000 BCE, whereas genetic evidence and historical sources would suggest years 710–60 BCE. Additional support for this hypothesis is provided in the next chapters, which present route-specific evidence and additional information of the most likely dates.

4.7 India → Phoenicia hypothesis

According to this hypothesis, *the Phoenicians received a part of their culture and genes from the Indian Subcontinent 3000–1800 BCE*. This hypothesis is an introduction or prologue to for the India → Mediterranean → British Isles hypothesis.

Archaeological, genetic, and historical evidence

The connection of the Phoenician and Indian cultures is supported by genetic data, according to which there were migrations from the Indian Subcontinent to West Syria starting from year 2650 BCE (Witas et al. 2013 and Palanichamy & al. 2014). This is close to year 2750 BCE when the first Phoenician cities were founded according to Herodotus [Hdt.hist.2.44]. The third millennium BCE migrations from India to Mesopotamia are supported also by evidence received from strontium isotope analysis (Keynoyer et al. 2013). In addition, the bronze bowls discovered in Nilgiris (South India) show remarkable resemblances to the bronze bowls of Ur and Assyria (Upadhyaya & Upadhyaya 1983).

India connects with the Phoenicians via the *Dilmun culture* of Bahrain. This culture was somewhat connected to the Harappan culture 2250–1650 BCE when they used the Indus Valley weight measurement system in trade. In addition, the Dilmun culture used Harappan seals for the

documentation of trade (Laursen 2018). According to Strabo, the Phoenicians came from Bahrain [Strab.16.3]. If we assume that Bahrain was part of the Harappan culture, and Bahrain was the source of the Phoenician culture, then the Phoenicians would have inherited a large part of their culture from the Harappan culture. This conclusion, however, is based on two unproven assumptions.

Unreliable sources

After the review of the more convincing evidence, it is possible to check out some less reliable sources. According to Waddell (1924, 9-14), the Phoenicians called themselves as *Khattiyo Ariyo Barats* in their documents, monuments, and coins. This would have a strong connection to India as in Sanskrit the word *Bharat* means “India” and *Arya* means “noble”. Unfortunately, the precise source texts were not specified by Waddell, which reduces the credibility of his argumentation. According to Waddell, the Phoenician coin of Figure 14 contains the inscription *Prwt*, which would be a cognate with *Barat*.¹³⁷ Yet, the connection from *Barat* to *Prwt* can be disputed.

According to Waddell (1924, 14), the Khatti of the Hittites made a treaty with the Mitanni ~1400 BCE, and this treaty was legitimized by invoking the names of the Vedic gods using the Indian names of these gods. This would mean that the Hittites and the Mitanni had a close connection to the Indian culture. Therefore, also the Phoenicians might have had a close connection to the Indian culture. In addition, the Phoenicians worshipped *Indara*, which was their other name for the Father-god Bel (Ibid, 13). *Indra* is one of the primary deities of India. This suggests that the Phoenician culture would have originated from India.¹³⁸ Due to the tendency of Waddell (1924) to use unclear argumentation lines and very old references without mentioning page numbers, the evidence provided by Waddell cannot be used without extraordinary caution.

¹³⁷ Waddell (1924, 9) with reference to *Histoire Romaine* (Duruy 1850)

¹³⁸ Contrary to this interpretation, Waddell intends to show that the Indian seafarers would have originated from Syria, instead of the Phoenician culture originating from India.

According to Waddell (1924, 13), the *Krivi* were the most sea-going clan of the Indians, and the name *Krivi* would have an onomastic connection to *Kuru*, which appears in the context of the Phoenicians “of Kur”, meaning “of Syria”. This onomastic connection, however, seems weak and speculative.

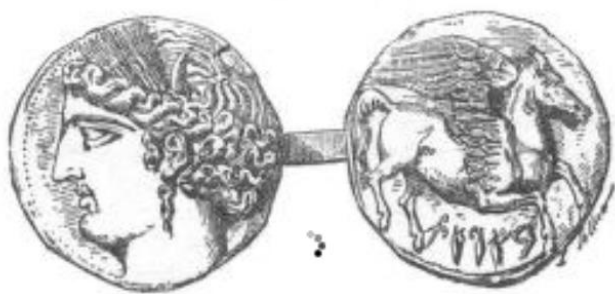


Figure 14: Phoenician coin with the word *Prwt*

According to Cicero, there once lived a famous man called *Hercules Belus* in India.¹³⁹ This name connects him to *Baal* who was worshipped in Syria. This means that the original source of the *Heracles* stories of the Phoenicians and the Greeks could have possibly been this *Hercules Belus* of India.

Evaluation

According to the India → Phoenicia hypothesis, *the Phoenicians received a part of their culture and genes from the Indian Subcontinent*. Even if we completely ignore the stories and interpretations that relate to Waddell and Cicero, the evidence in support of this hypothesis can be rated as *tentative* because it consists of coherent archaeological, genetic, and historical evidence.

4.8 India → Mediterranean → British Isles hypothesis

According to this hypothesis, *there was some migration from the Indian Subcontinent to the British Isles via the Mediterranean Sea 3000–50 BCE*. This hypothesis is supported by only tentative evidence. Therefore, the more critical readers may skip over this chapter entirely. However, it is necessary to present this tentative evidence in order to get a comparison point for the India → Africa → Western Europe hypothesis.

Historical context

According to chapter 4.2 there was a somewhat active trade route between the Mediterranean region and the coasts of the North Sea 2300–1500 BCE.

During this period, the Egyptians constructed a canal that joined the Nile with the Red Sea 1850 BCE.¹⁴⁰ It is possible that the canal of the Egyptian pharaohs 1850 BCE would have been an answer for this growing trade between India and the Mediterranean region or even for the growing trade between India and Western Europe. In addition, chapter 4.7 shows that there were early migrations from the Indian Subcontinent to Western Syria either via Bahrain and Mesopotamia, or via the Red Sea. The canal between Nile and the Red Sea was rebuilt a few times 1850–50 BCE. One likely period would have been the Hyksos dynasty of Egypt 1638–1530 BCE, as the Hyksos were Asians who would have had a motive of keeping the canal open in order to speed-up travel and trade. Another period of active use of the canal started around 600 BCE, when Pharaoh Necho II rebuilt the canal [Hist. 4.43]. This date matches with the GAHAH dates of the migrations from the Indian Subcontinent to the British Isles (600–400 BCE).

The Phoenicians of Carthage used to sail frequently to the British Isles already ~500 BCE (p. 101). Herodotus (Greece) and Strabo (Anatolia) were less informed of the details of this tin trade route. According to Herodotus, the Greeks received their tin from the *Tin Islands* [Hdt. 3.115] and according to Strabo, the tin originated from the *Casserites*, which he considered as relatively small islands that were located north from Iberia [Strabo 3.5.11]. According to the *Periplus of the Erythraean Sea*, the Romans traded with Indians during the first century CE. The central point in the trade of the Indian Ocean was the Gulf of Khambhat (Seland 2016). This creates a tentative end-to-end trading route between India and the British Isles already 500 BCE – 150 CE, organized by the Phoenicians.

Genetic evidence

According to Borsboom (2020, p. 21), the geographical distribution of mtDNA haplogroup *I* and mtDNA haplogroup *W* indicate a maritime migration route from India to the coasts of the North Sea via the Mediterranean Sea. This conclusion,

¹³⁹ Cicero [De Natura Deorum 3.16.42]

¹⁴⁰ Encyclopedia Britannica, Suez Canal, History.

however, is a bit shaky, as haplogroup *I* appears widely in Scotland and Iceland, but not very frequently in the Indus Valley. Haplogroup *W*, on the other hand, appears densely in the Afghanistan – Tajikistan region, but is almost non-existent in the Northwestern Europe.

According to GAHAH, there was migration from Tuscany to the Indus Valley around 3678 BCE, range of 95% confidence being 5890–710 BCE (Table 36, p. 135). This indicates migrations also to the opposite direction based on the counter-current principle (see p. 25). In addition, there were migrations from the Indus region to Syria, Wales, and Scotland ~598 BCE and to Palestine, Ireland, and Scotland ~402 BCE (GAHAH, “Kalash”). This

suggests that the people who migrated to the British Isles would have used the Mediterranean route. The migrations from Eastern Afghanistan to Syria coincide with the date ~600 BCE when Pharaoh Nechos reconstructed the Nile – Red Sea canal [Hist. 4.43]. There is also some undated GAHAH data, according to which the *Southern Italian* population has a 5.8% genetic match with the Indian Jew population, and east Sicilian population has a 0.9% match with the Balochi population of the Indus Valley. Although these similarities are undated, they prove that migration from the Indus Valley to Southern Italy has probably occurred.

Table 36: Migrations between the Indian Subcontinent and the Mediterranean – Black Sea region (GAHAH)

Group	Origin of migration	Destination	Likeliest year (BCE)	Start of 95% confidence (BCE)	End of 95% confidence	Regional likeliest year (median, BCE)	Regional confidence range (BCE)
1	Caucasus	Burusho	5218	11910	214 CE	2446	4602 BCE – 94 BCE
		Burusho	2446	4602	270 CE		
		Balochi	850	8550	94 BCE		
2	Caucasus	Sindhi	710	3958	94 BCE	402	710 – 94 BCE
		Kalash	402	710	38 BCE		
		Pathan	346	7262	410 CE		
3	Saudi Arabia, Yemen, UAE	Brahui	3678	9894	598 BCE	3678	9894 – 598 BCE
4	Cyprus	Brahui	3678	9894	598 BCE	3678 – 3034	5890 – 710 BCE
	Tuscany	Makrani	3034	5890	710 BCE		
	Caucasus						
	Saudi Arabia						
5	Western India	Ethiopia	~1886	3062	430	1886	3062 – 430 BCE
6	Palestine	Kalash (multiway)	402	710	38 BCE	598 – 402	710 – 38 BCE
	Druze (Syria)	Kalash (multiway)	598	990	206 BCE		
7	Yemen	Balochi	850	8550	94 BCE	402	710 – 94 BCE
	Saudi Arabia	Kalash	402	710	38 BCE		
	Iran	Kalash	402				
8	Wales, Scotland, Lithuania	Kalash (Eastern Afghanistan, multiway)	598	990	206 BCE	598 – 402	710–206 BCE
	Ireland, Scotland, Orkney Islands, Norway		402	710	38 BCE		

Archaeological evidence

According to Schuhmacher (2017), Asian ivory, dating to 3500–2500 BCE, has been found in Iberia in large quantities. As there is no evidence of Syrian elephants before year 1800 BCE,¹⁴¹ the Asian ivory that was used in Iberia during the fourth and third millennium could have arrived from India, along with Indian traders and migrants. The likeliest route of these migrations would have passed via the Middle East, as the Iberian ivory industry used Asian ivory on the east coast of Iberia whereas African ivory was used on the western and southwestern coasts of Iberia. This ivory trade route from the Indian Ocean to Iberia might have been a motivation for the Egyptians who connected the Nile to the Red Sea with a canal around 1850 BCE.¹⁴² Soon after, amber of the North Sea and the Baltic Sea was traded to Mycenaean Greece; it has been found in a shipwreck at the southern coast of Turkey, dated approximately to 1550 BCE (Bunnefeld and Diethrich 2023). These archaeological findings indicate a trading route from India to the Mediterranean and from the Mediterranean to the British Isles already 3000–1500 BCE.

According to Serner (1938, 27), the cup-marks on the boulders that surround some Indian tombs, are identical with the marks found in the stones placed around the same class of tumuli in Europe; these dolmen appear in South India, Jordan, Abyssinia, North Africa, Sardinia, Corsica, Pyrenees, Spain, and Scandinavia.¹⁴³ According to the Historic Environment Scotland, cup-marks on stones are common also in Scotland, dated to 4000–2000 BCE. This distribution of the cup-marks suggests diffusion of the cup-mark tradition from India to Britain (or vice versa) via the Mediterranean region, or alternatively diffusion of this tradition from the Mediterranean region to India and Britain. A third alternative would be the *chance resemblance*, unless

the constellations of cup-marks would be complicated enough and yet show high similarity.

According to Haimendorf (1945, 84), a special feature of Indian and Western European dolmen was “*the custom of leaving open one end of the cist or breaking a hole at the rim of the capstone, the so-called soul-hole believed to serve as an escape to the soul of the deceased*”. According to Dikshitar (1947, 22), the ceramic wares of India had a close resemblance with the Egyptian, Greek, and Etruscan ceramic wares, and the Indian sarcophagi of Pallavaram resemble certain terracotta coffins found in Bagdad and Etruria. According to Upadhyaya & Upadhyaya (1983), the ornaments of gold discovered in the tombs of Adichanallur of Dravidian India resemble those discovered in Enkomi, Cyprus and the surrounding regions of the Bronze Age. This would suggest migration or close cultural connection from India to Cyprus, which is also one leg of migration on the way from India to Italy. According to Das (2018), the game boards that have been carved to flat stones in Britain, Italy, and India are strikingly similar (p. 4). Unfortunately, Das did not provide any detailed information of the locations or dating of these carvings.

The expansion of the Phoenician culture to Britain receives weak or tentative support from the rock-paintings of the Tanum area of the Bohuslän in Sweden. Some of these paintings seem to show a rostrum, which was typical for the Phoenician warships and then later on for the Greek triremes. It is likely that the use of rostrums would have arrived to Bohuslän via the Mediterranean–Atlantic route, passing the British Isles on its way.¹⁴⁴

Linguistic and onomastic evidence

The relatively weak linguistic and onomastic evidence that supports the India → Mediterranean → Britain hypothesis has been summarized below.

¹⁴¹ Çakırlar et al. (2016)

¹⁴² Encyclopedia Britannica, Suez Canal, History.

¹⁴³ Book review available by Clemen C. (1939) Review of “Serner, Arvid: On “Dyss” Burial and Reliefs about the Dead during the Stone Age with special Regard to South Scandinavia.

¹⁴⁴ Rostrums are more typical to sea-faring vessels than to boats that are used on narrow river routes, as as rostrums make it more difficult to pull boats across dry land. Therefore, rostrums were unlikely to arrive via the Volga-Baltic route.

Insular Celtic: The Insular Celtic language of Britain shares many features with Afro-Asiatic languages, which are spoken in the Near East and in Northern Africa. According to Jongeling (2000, 64), “*After the studies of Morris-Jones, Pokorny, Wagner, and Gensler it seems impossible to deny the special links between Insular Celtic and Afro-Asiatic*”. This view is shared by Gensler (1993) and Matasović (2012). According to Gensler (1993), there are 20 grammatical, morphological, or phonetic similarities, which connect the Insular Celtic to Afro-Asiatic languages, and which are missing from the Indo-European languages.¹⁴⁵ This suggests migrations from the Near East to the British Isles, maybe during the times of the Phoenicians. Although the features of the Insular Celtic language could possibly connect it to Afro-Asiatic languages, this is still very weak evidence concerning the connections from India to Britain.

Basque: Based on a critical review of Lahovary (1963), the Basque language has a relatively high lexical similarity with the Tamil-Kannada language group of India, and relatively low similarity with other Dravidian languages (p. 94). This indicates that Proto-Basque would have received Proto-Tamil-Kannadan loan words 1500–500 BCE (see 3.8). Such a late date suggests Indian migrations to the Basque country via waterways, which means either the Mediterranean Sea or the route around Africa.

Etruscan: According to Konov (1904), the Etruscan and Dravidian languages have many cognates, and share grammatic, morphemic, and phonetic features. Konov reported his findings of similarity based on Torp (1902), and all these similarities could be a result of cherry picking. Therefore, this evidence should be given low weight, or alternatively, the similarities that Torp (1902) reported should be re-examined. The self-published research results of Professor Santos (1995–2005) may add some weak or tentative evidence to the similarity of Etruscan and Dravidian. Santos studied several hundred Etruscan words, focusing at those words that did not seem to originate from intending

to cover all known Etruscan words that were not loaned from Phoenician, Celtic, Latin, or Greek. According to Santos, the potential cognates that he found indicate cultural contact and the borrowing of words. In addition to the similarity of words, Santos reported also grammatical similarities between Etruscan and Dravidian:

1. Both languages belong to an unknown linguistic family.
2. Both use suffixes, and seldom or never prefixes or infixes.
3. Both invariably place the main root or stem at the start of a compound word.
4. Both are agglutinative, forming their words more or less at the spur of the moment.
5. Both use odd consonantal connectives that closely correspond in the two.
6. The cases and conjugations (where known) are also closely matched.
7. The phonetics of the two tongues, known from their alphabets, etc. are remarkably similar.

The credibility of the study of Santos is reduced, as he did not publish the list of identified potential cognates and as he did not even tell their quantity.

If we assume a connection from India to the Etruscan language via loan words, then this connection would have occurred 900–200 BCE, which was the era of the Etruscan culture. This period matches with the estimated time of the heavy contact between Proto-Basque and Proto-Tamil-Kannada 1500–500 BCE. This would suggest a tentative migration corridor from India to Etruria and Basque country 900–500 BCE. The problem of this hypothesis is that the potential Dravidian influence in Etruria could have arrived equally well around Africa via the Atlantic Ocean.

Pathmanathan: According to Pathmanathan (1979, 3–4), the Tamil word *ur* (“city”) connects with the Sumerian city of *Ur*, with the Egyptian city of *A-Ur* and the Scottish city called *Ur*. In addition, the Tamil word *ur* connects with the Latin word *urb* (“city”) and may have some connection to the Basque word *iri* (Ibid, 3–4). The geographical

¹⁴⁵ For a critical review concerning these similarities, see Graham (2008, 26).

distribution of the word *ur* suggests that it would have diffused from India or Sumer to Basque country and Scotland via the Mediterranean Sea before the times of the Romans and before the *urb* variant of the word. According to Pathmanathan (1979, 3–4), another Tamil word is *ar* (“Plough”) which appears in old English dictionaries in the form of *ard* (“Plough”). This could indicate that the British Isles received their knowledge of agriculture from the Dravidians (Ibid, 4). In addition, the Tamil word *ari* (“Lion”) is the root of the names of the Irish kings *Ari* and *Ariri*, and the Tamil name of the god *Bala Singham* is the root of the Sumerian god *Bal* and the Irish god *Bel* (Ibid, 28). The geographic distribution of these loan words would suggest migrations from India to Britain via the Mediterranean region. Yet, all of these words and names are very short, which increases the probability of chance resemblance. In addition, Pathmanathan has proven to be a relatively unreliable source (see p. 130).

Historical evidence

According to Polybius, Hannibal used Indian elephant riders when he attacked Rome 218 BCE (see p. 116). This indicates a migration route from India to Carthage. According to Himilco, the Phoenicians traded with Britain already ~500 BCE (p. 100). These historical sources suggest that the route from India to Britain via the Mediterranean Sea would have been known already 500–200 BCE.

According to Cornelius Nepos (~50 BCE), an Indian chieftain had sailed with a relatively large group of Indians to Germania in order to do commerce, and had then acquired the position as the king of the Suevi.¹⁴⁶ This voyage to Germania occurred during a period, when the Roman Empire imported silk, spices, and pearls from India via the Red Sea.¹⁴⁷ This suggests migration from India to Germania via the Mediterranean Sea.

Cultural similarities

According to Swaminathan (2012), the Sea Peoples (~1200 BCE) and the Etruscans (~800 BCE) originated from the Tamil culture of India. According to him, this is proven by the similarity of the following shared cultural traits:

1. cremation of the dead and the usage of ash urns
2. belief in the afterlife
3. a calendar that contained information of the flight of the birds
4. belief that the gods speak to people via thunder and lightning
5. usage of liver for predicting the future
6. belief in seers
7. writing from right to left (like in the Indus seals)

In addition, the Etruscan culture and the ancient Vedic culture were both based on gender equality, and the musical instruments of the Etruscans resembled their Indian counterparts (e.g. Tamil’s Horn and Lyre). The problem with these observations is that they have not been peer reviewed. In addition, Swaminathan does not analyze alternative interpretations, such as chance resemblance or the descent of these cultural traits from a shared ancestral culture that would have been located outside of India.

According to Pliny the Elder, the following customs of the Druids seemed as if they had been imported to Britain from Persia: *The worship of the stars, lakes, forests, and rivers; the ceremonials used in cutting the mistletoe, samiolus, and selago, and the virtues attributed to the adder’s egg* [Nat. Hist. V.4.427]. These similarities could have arrived to Britain during the period when the Achaemenid Empire reached from Pakistan to Egypt (550–330 BCE) and when there was a channel that connected the Red Sea to the Mediterranean Sea, starting from the times of Darius the Great (522–486 BCE).

¹⁴⁶ Cornelius Nepos (quoted by Pliny the Elder [Nat. Hist. II.67] and by Pomponius Mela [Geog. 3.5])

¹⁴⁷ See Seland 2016, and Google Classroom: The Maurya and Gupta Empires.

Old myths and John Waddell

This chapter starts with some old myths, and then continues with the observations and conclusions of Waddell (1924).

The India→Mediterranean→ British Isles hypothesis receives weak support from an Indian legend, which was documented around 300 BCE by Megasthenes.¹⁴⁸ According to this legend, the indigenous Indian *King Heracles* ruled India at the time when the first cities were built to the Indus Valley. After becoming the king, Heracles *traversed all sea and land* and defeated all evil tribes. This indicates travelling to very distant places that were over the seas. The note about the first cities of India would date Heracles and his marvelous voyages approximately to 3000 BCE. This matches with the motif, according to which *Heracles* did not use metal weapons, and instead, was wielding a club. According to Diodorus Siculus, Heracles retired in Sardinia after completing his heroic acts [Libr. Hist. IV.29]. If we assume that *Heracles* of India and the Mediterranean Heracles were the same character, this would suggest migration from India to Sardinia ~3000 BCE. The unity of *Heracles* and the Mediterranean Heracles receives some weak or tentative support from Cicero, according to whom the *Indian Hercules* was called *Hercules Belus*, which means that he would have been the origin of the Phoenician stories of Heracles and Baal. According to Waddell (1924, 44), one temple in Britain was dedicated to “Hercules of the Segonti Britons”.¹⁴⁹

According to Strabo, some people claimed that the Mauretanians had come from India to Mauretania, along with Hercules [Geog. 17.160]. As *Mauretania* referred in ancient Roman texts to the region of Algeria, Tunisia, and Morocco, the likeliest route from India to Mauretania would have passed via the Red Sea and the Mediterranean Sea, assuming that

there would have been a canal to connect the Red Sea and the Nile. The reference to *Hercules* would date the migration to early Bronze Age, and the assumption of a canal would locate the end of the beginning of the second millennium BCE, when a canal first time connected the Nile to the Red Sea. The problem of these old traditions is that they would date the migrations to a very early period, and in addition, they are very unreliable sources of information.

According to Waddell (1924, 17), the so called Newton Stone, which was found close to *Gady* and the *Gadie River* near Aberdeen, seems to be of Phoenician origin. The place names *Gady* and *Gadie* have a connection to the *Gades/Gadeirus* name family, which is generally considered a Phoenician name, but which seems to originate from India (see p. 87 and 199–201). This creates a tentative connection from India to Britain via the Mediterranean Sea. According to Waddell (1924, 32) the text in the Newton Stone reads as follows.

*This Sun-Cross¹⁵⁰ was raised to Bil¹⁵¹ by the
Kassi¹⁵² of Käst¹⁵³ of the Siluyr of the Khilani,¹⁵⁴
the Phoenician (named) Ikar of Cilicia, the
Prwt.¹⁵⁵*

Based on the letters and symbols used, the stone cannot be from a later time than ~400 BCE (Ibid, 33). According to Waddell, the *Kassi* of the inscription in the Newton Stone has a connection to the *Kāśi* of the Vedic literature, who were described as offerers of the sacred fire and as especial protégés of Indra (Ibid, 48). The name *Kassi* appears in Briton coins also in the form of *Cas* (Ibid, 48, see Figure 15). The name *Prat* / *Prwt* of the Newton stone appears also in a Phoenician coin of Carthage (see p. 134). According to Waddell, this would have a connection to the name *Bharat* that means “India” in the Sanskrit language.¹⁵⁶ The change between B

¹⁴⁸ The original manuscript of Megasthenes has been lost, but the story of Heracles has been quoted by Arrian [Indica] and by Diodorus Siculus [Libr. Hist. II.38].

¹⁴⁹ Waddell (1924, 44) bases this claim on Caesar [Gal. 5.21], but this chapter does not contain a note about Hercules.

¹⁵⁰ Swastika (Waddell 1924, 32)

¹⁵¹ *Bel*, the God of Sun-Fire (Waddell 1924, 32)

¹⁵² or Cassi-bel[-an], Waddell (1924, 32)

¹⁵³ *Käst* of *Kwast* would refer to the city of Kasta-bala, which is located at Budrum (Waddell 1924, 45)

¹⁵⁴ Hittite-palace dwellers (Waddell 1924, 32)

¹⁵⁵ Synonym of *Prat*, meaning *Barat*, *Brihat*, or *Briton* (Waddell 1924, 32)

¹⁵⁶ Waddell (1924, 9), see also Figure 14 (p.141).

and P is a small one (see p. 85); this is illustrated by the Greek word for the Britons, *Pretanoi*.

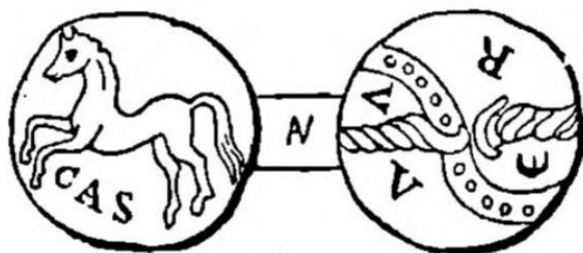


Figure 15: Briton coin with the name CAS (Waddell 1924, 48)

According to Waddell (1924, 49), the pre-Christian cross and swastika appear in the Newton stone and in Babylonian and Indian inscriptions. This indicates a cultural connection from India to Britain or from Mesopotamia to India and Britain. Swastikas have also been found in the pottery in Eastern Africa (Dunham 1965), which is along the way from India to Britain along the Mediterranean route.

According to Waddell (1924, 5), the early Briton kings of the pre-Roman times called themselves *Catti*, which is the same honorary name that the Hittites used for themselves, *Khatti* or *Catti*. The members of this *Khatti* ruling class called themselves as *Arri* in Syrio-Phoenicia and as *Khattiyo Ariyo* in India (Ibid, 8). As noted in chapter 4.7, Waddell does not provide sufficient evidence of the existence of the expression *Khattiyo Ariyo* in Indian texts. According to Waddell (1924, 65), the name of the tribe of the *Britons* originated from the word *Barat-ana*, which means “the ones who came from Barat”. The affix *ana* appears Hitto-Sumeric and Vedic texts as *ana* (e.g. Rajput-ana or Gondwana), in Cymric Welsh as *ain* (e.g. Pryd-ain), and

in Scottish as *ane* (Ibid, 93). The name *Barat* appears also in the name of the *Dun-Barton*, which means the Fort of the Bartons (Britons). The other variants of Barat have been introduced in page 141. As Waddell does not give specific references to the languages and texts in which the word *Barat-ana* would have appeared, the link from *Barat* to *Britons* remains very weak.

If we assume that the Indians participated in the Trojan War ~1184 BCE, it may be possible to create a link from India all the way to Britain. According to Geoffrey of Monmouth (~1140 CE), the Trojan hero Brutus sailed to Italy after the collapse of Troy. From there he sailed to Gades and then to the British Isles (Waddell 1924, 151-152). If we assume that Brutus had made friends and alliances of Memnon’s Indians (p. 113), it would be possible that a large group of the Indians would have followed him all the way to Britain, which was famous for its abundant quantity of tin (see p. 108). This creative patchwork of old legends could possibly explain the arrival of Indian genes, names, customs, and artefact styles to the British Isles.

According to Waddell (1924, 9), the old Brythonic word *Bretani* originated from the same root as *Bharat*, and the historical variants of this word include *PRT* (Phoenicia), *Barateon* (Lycaonia), *Barata*, *Briitum*, and *Piritum* (Babylonia), *Parat* and *Prydi* (Sardinia), and *Prat* or *Pwrt* (Britain). According to Waddell, the goddess *Britannia* appears in Lycaonian, Briton, and Phoenician coins as a maritime female character who has a special type of a hat and who carries along a cross (see Figure 16 below).



Phoenician coin from Sidon
(undated)



Lycaonian coin from Anatolia
(Roman period)



Roman coin from Britain
(138-161 CE)

Figure 16: Indo-Phoenician goddess Barati in ancient coins (Waddell 1924)

According to Waddell (1924, 58), the god that was called *Barati* in the Lycaonian coin was characterized as *Brihad-the-Divine*¹⁵⁷ or *Mother Earth Pritvi*¹⁵⁸ in the Vedic hymns. This suggests that the characterization of the Indian goddess *Brihad* would have migrated to Britain via the Phoenician culture. However, a better interpretation of these names would be to consider the Indian goddess of poetry, *Bharati*, as the root of this goddess family. According to Waddell (1924, 58), this same goddess may appear also as the Egyptian goddess named *Bāīrthy*, who was the goddess of the water and who was an imported character within the Egyptian culture (Ibid, 60). She is also possibly the same character as the *Lady Protector of Zapuna*, which was a city along the coast of the Red Sea. The name of *Zapuna* reads in Egyptian texts as ZA-PUNAQ, which has a likely connection to the Phoenicians who were called *Panag* by the Egyptians (Ibid, 61) and *Punic/ Punicus/ Poenus* by the Romans. As the word ZA means “sailing”, the Lady Protector of Zapuna would have been the protector of Phoenician sailings. According to Assyrians (950 BCE), the country of *Za-Bu-na* was under the protection of *Lady of Bil* or *Bel* (Ibid, 61). This connects to Britannia and the Phoenicians as *Bel* was a Phoenician god. This Lady Protector of Za-Bu-na was invoked by a Babylonian emperor about 680 BCE as a *Phoenician god across the Sea*

(Ibid, 62). One more *Peer* of the goddess *Barati* was *Brito-Martis*, who a Phoenician goddess according to Roman traditions (Ibid, 63). She was the divine daughter of Phoinix, the king of Phoenicia. Brito-Martis was worshipped mainly on the island of Crete. Although she has been commonly considered a Greek goddess, she could equally well be a Phoenician goddess, as Crete has been colonized by the Phoenicians after the collapse of the Minoan culture. If she were to be a Phoenician goddess, her name would create a clear link on the onomastic chain from *Barati* to *Britons*. The problem of the hypothetical lineage from *Bharati* (India) to *Bretani* and *Prat* (Britain) via the names *Barata*, *Barateon*, *Briitum*, *Brito Martis*, *Piritum*, *Parat* and *PRT* is that the characterization of these goddesses (or persons or tribes) varies among the different instances of this name family. For example, the *Bharati* of India was a goddess of poetry, whereas the *Barateon* of Lycaonia was characterized with motifs that did not connect her to poetry.

In general, the problem with Waddell’s book is that it does not present its sources with sufficient precision so that his arguments and conclusions could be verified. Waddell, for example, claims that the Indians had an elite caste called *Khattiyo Ariyo*, but does not specify in which texts this expression would have been used.¹⁵⁹ In addition, he is too

¹⁵⁷ The correct spelling is *Brihat deva* or *Brihaddeva*, and he was a god and not a goddess in the Vedic texts.

¹⁵⁸ The correct spelling is *Prithivi*.

¹⁵⁹ In India, there existed a warrior clan or “caste” called *Kshattriya varna* [RV IV.42.1]. However, there is a need for identifying the specific text, in which *Kshattriya varna* would have transformed into *Khattiyo Ariyo*.

focused at interpreting the archaeological findings and historical sources via the lens of the Aryan invasion theory, assuming a powerful white Aryan race that would have lived in Anatolia or Caucasus, invading India later on and expanding to the British Isles around 400 BCE via the Mediterranean Sea. As the connotation of the theory of the “Aryan race” declined after the collapse of the Nazi ideology around 1945, Waddell’s theory was considered rather outdated, and his deciphering of the Newton Stone was disputed. A good example of Waddell’s Aryan bias is his interpretation of the *Siluyr*. Waddell (1924, 32) considered them a sub-clan of the supposedly Aryan tribe of the Khilani, although he recognized that the *Siluyr* could also have

referred to the dark-skinned people who came to Britain via Spain from the vicinity of *Mountain Silurus* (Ibid, 51). Despite the biased interpretations of Waddell, his archaeological findings and historical references can offer interesting clues of the origin of some ancient ethnic groups of Britain.

Evaluation of evidence

According to the India → Mediterranean → British Isles hypothesis, *there was some migration from the Indian Subcontinent to the British Isles via the Mediterranean Sea 3000–50 BCE*. Table 37 (p. 142) summarizes the *tentative* evidence that supports this hypothesis.

Table 37: Summary of evidence for the India → Mediterranean → British Isles hypothesis

#	Type of evidence	Central pieces of evidence	Strength of evidence
1	Genetic (p. 129)	There were migrations from the Indus region to Syria, Wales, and Scotland ~598 BCE, and to Palestine, Ireland, Scotland, and Orkney Islands ~402 BCE (p. 135). The Southern Italian population has a 5.8% genetic match with the Indian Jew population, and the Scottish population has a 23.1% match with the Kalash of the Indus region.	Tentative
2	Historical (p. 138)	A canal joined the Red Sea and the Nile sporadically 1850–200 BCE. Hannibal used Indians as elephant riders 218 BCE [Pol. Hist. 1.40.250]. This indicates an Indian colony in Northwestern Africa or an active sea route from India to Carthage. The Phoenicians of Carthage and Gades sailed occasionally to the British Isles already ~500 BCE according to Himilco (p. 100). According to Cornelius Nepos, an Indian chieftain had sailed to Germania ~50 BCE in order to do commerce.	Tentative
3	Indirect	There is tentative evidence concerning migrations from India to Britain without specifying a route (p. 153). This provides some support for the Mediterranean route.	Tentative (or weak)
4	Onomastic (p. 136)	Several Indian-like anthroponyms appeared in ancient Iberia. Several ancient European tribes had a name that is still more common as an anthroponym in India than in Europe (see p. 115).	Weak or tentative
5	Archaeological (p. 136)	There was a large industry of Asian ivory in Iberia already 3000–2000 BCE, and a maritime trade route connected the Mediterranean region and the coasts of the North Sea already 2300–1500 BCE. The ceramic wares of India resemble the Etruscan ceramic wares, and the Indian sarcophagi of Pallavaram resemble certain terracotta coffins discovered in Bagdad and Etruria (Dikshitar 1947, 22),	Weak (or tentative)
6	Linguistic (p. 136)	Based on a critical review of Lahovary (1963), the Proto-Basque may have loaned a large amount of words from Proto-Tamil-Kannada 1500–500 BCE (see 3.8). The Etruscan language shares cognates and grammatical features with the Dravidian language (Konov 1904, Santos 1995–2005, unreliable).	Weak
7	Cultural (p. 136)	There are similarities between the Etruscan culture and the Vedic culture of India (Swaminathan 2012). Three somewhat complicated ceremonies appear in a similar form in India and at the British isles (Pathmanathan 1979, 30, 56). The culture of the Druids of Britain resembled the culture of the Persians [Plin. Nat. Hist. V.4.427]; the Persians controlled parts of the Indus Valley 522–486 BCE when a canal connected the Red Sea and the Nile.	Weak
8	Unreliable sources	Waddell (1924) presents a large amount of examples of the potential migration of cultural replicators from India to Britain, or from the Near East to Britain (p. 139).	Weak
Total evidence			Tentative

Although there might have been occasional trading parties that would have sailed all the way from India to Britain and Germania via the canal of the Pharaohs and via the Mediterranean Sea, it is unlikely that large fleets could have used this route for travelling to Western Europe. Based on this, it is unlikely that migrations via the eastern part of the Mediterranean Sea could explain the lexical similarities between Etruscan and Dravidian or between Basque and the Dravidian languages. This weakens the credibility of the presented linguistic evidence.

4.9 Baltic → Caspian → Indus hypothesis

According to the Baltic → Caspian → Indus hypothesis, *people from the Baltic region migrated to the Indus Valley 5200–200 BCE via eastern river routes. The likeliest route would have been the Baltic–Volga–Caspian–Amu Darya route.*

Genetic evidence

According to GAHAH data, there were 11 admixture events, which carried genes along the route that goes from the North Sea to Russia, Chuvash (Volga), Caucasus, and the Indus region (Table 38 below).

Table 38: Migration from Northern Europe to the Indus region 5218–346 BCE (GAHAH)

#	Origin of migration	Destination in the Indus region	Likeliest year (BCE)	Start of 95% confidence (BCE)	End of 95% confidence	Aggregated likeliest year (median or median range, BCE)	Aggregated confidence range
1	Wales, Scotland, Orkney Islands, Lithuania	Burusho	5218	11910	214 CE	3678 – 2530	4602–598 BCE
	Finland, Lithuania	Brahui	3678	9894	598 BCE		
	Norway, Germany, Poland, Lithuania, Finland	Pathan	2530	10510	1242 CE		
	Orkney Islands, Scotland, Norway, Germany, Poland, Lithuania	Burusho	2446	4602	270 CE		
2a	Orkney Islands, Norway, Finland	Russia (Valkeajärvi)	2054	5162	710 BCE	2054	5162–710 BCE
2b	Chuvash						
3	Orkney, Norway, Finland, Russia (Valkeajärvi)	Chuvash (Volga)	1606	2558	298 CE	1606	2558 BCE – 298 CE
4a	Orkney Islands, Poland, Lithuania, Finland	Balochi	850	8550	94 BCE	850	4a–4c : 710–94 BCE
4b	Wales, Scotland, Lithuania	Kalash (Afghanistan multiway)	598	990	206 BCE	598–402	710–38 BCE
	Ireland, Scotland, Orkney Islands, Norway		402	710	38 BCE		
4c	Ireland, Wales, England, Orkney Islands, Lithuania	Sindhi	346	3118	74 CE	346	3118 BCE – 74 CE
5	Chuvash (Volga)	Kalash (Afghanistan multiway)	402	710	38 BCE	598 – 402	710–38 BCE
6	Caucasus		598	990	206 BCE		

This suggests migrations from the Orkney Islands to the Indus region via the Baltic Sea. The first group

of these admixture events connects the North Sea and the Baltic Sea with the Indus region. Likeliest

period of these migrations would have been 3678–2530 BCE as this interval represents the median of the likeliest years.

The regional confidence ranges were estimated by taking the latest starting date of the 95% range, and the earliest end date of the range, selecting from all migration events within that regional group (red highlight). The route of the Orkney Islands → Indus migrations seems to have passed via Lake Valkeajärvi (Karelia) and via River Volga (Chuvash). This is because the *Russian* population of GAHAH is located next to Lake Valkeajärvi,

which is located along the Baltic Sea – Volga route. In addition, *Chuvash* is a settlement along the Volga River. Lake Valkeajärvi and River Volga are connected (almost) to each other via River Šeksna. The migrations between the Orkney Islands and Indus Valley have been illustrated to Figure 17 below. Based on this diagram, some likely legs of this route would have been 1) the North Sea to Valkeajärvi leg, 2) the Valkeajärvi to Chuvash leg, 3) the Chuvash to the Caspian Sea leg, and 4) the final leg from the Caspian Sea to the Indus Valley, possibly via the Amu Darya River. The data of Table 38 has been illustrated to Figure 17 below.

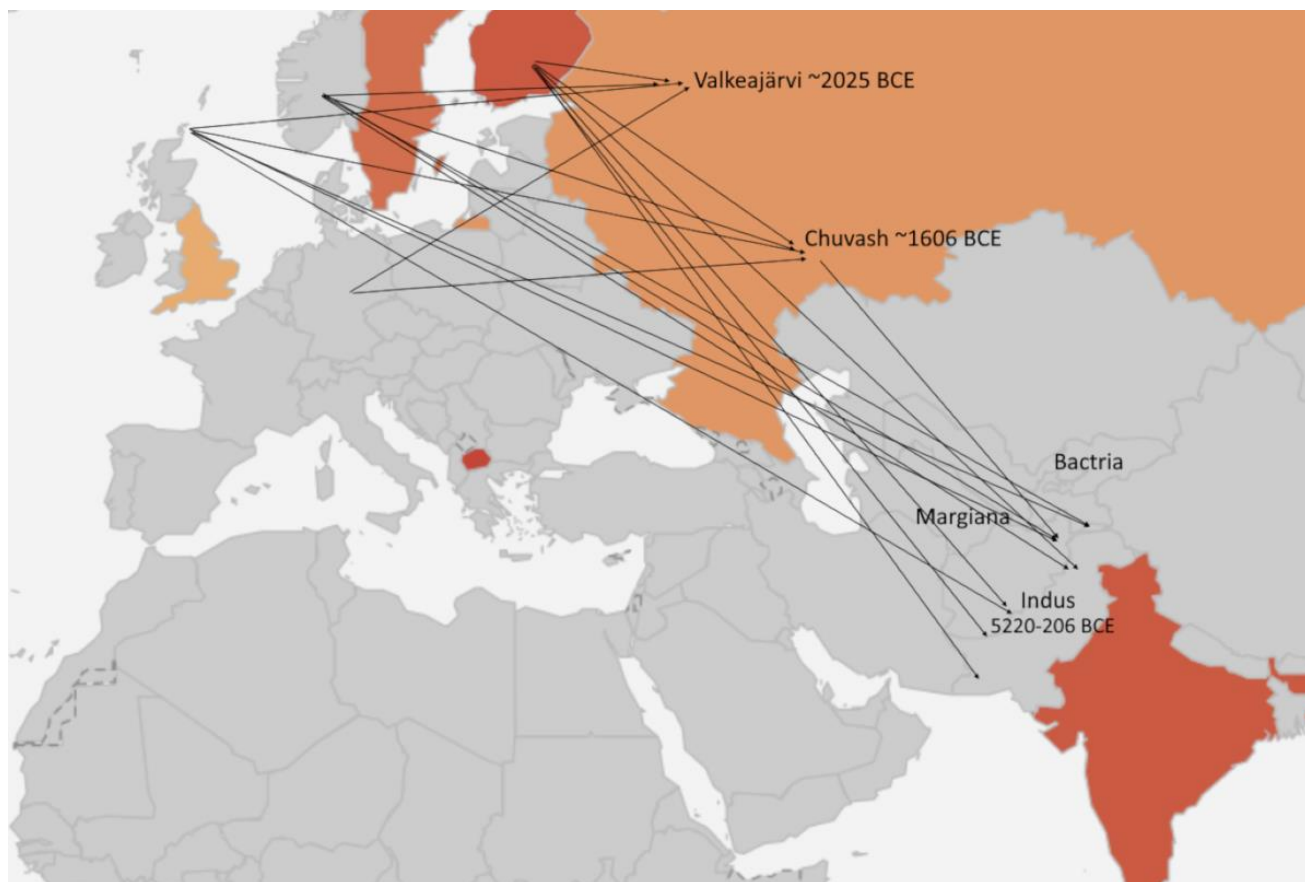


Figure 17: Migration of genes from Europe to Indus Valley 5220–206 BCE

The time of the migrations from the Orkney Islands and Finland to Chuvash (~2050 BCE) and the migrations from Chuvash to the Indus Valley (~1606 BCE) match with the period of the Bactrian-Margiana Archaeological Complex (BMAC), dated to 1900–1550 BCE (see [Parpola 2017](#)). This

suggests that the route from the Baltic Sea to the Indus Valley would have passed through BMAC.

Archaeological evidence

According to Carpelan (2002) and Parpola (2012), the Netted Ware culture emerged at Upper Volga

~1900 BCE.¹⁶⁰ This culture reached all the way to the Northwestern Finland, and covered mostly those rivers that connected Volga to the Baltic Sea. This suggests that the Baltic–Volga route would have been important already ~1900 BCE. According to Tallgren (1916, 360), the people of the Baltic region not only traded with the Volga–Kama region, but also founded colonies there during the late Bronze, based on the geographic distribution of the Mälär bronze axes.¹⁶¹ The center of the Volga–Kama region is close to the Chuvash population of Figure 17. According to Lavento (2023, 123–212), the geographic distribution of the Akozino–Mälär bronze axes 1200–1000 BCE indicates migrations between Sweden and the Volga–Kama region via Finland during this period, and the distribution of the later Ananino axes 800–400 BCE indicates migrations between northern Sweden and the Volga region via Finland.¹⁶² This matches with Tallgren (1916, 360), but leaves open the direction of migrations.

Linguistic and cultural evidence

According to Parpola (2017), the Abhashevo culture and the related Sejma-Turbino network (2200–1900 BCE) were bilingual Proto-Finno-Ugric and Proto-Indo-Aryan. This suggests some kind of a connection between Finland and India.

According to Foghlu (2016), the Indians of Kerala still use similar C-shaped horns that the Irish and the Scandinavians used 2000 years ago. This would suggest a potential cultural connection via the Baltic–Volga–Caspian route. A C-shaped horn is illustrated in the rock carvings on stone #8 in the Kivik tomb, Scania, Sweden. Yet, the unearthed horns seem to have been 3-dimensionally curved 1300–500 BCE (De Angeli et al. 2018, 54)

The Kalash, whose genes indicate migration events between the Indian Subcontinent and the British Isles consist of several peoples. One of them is the *Väi* people, who were also called *Vai*, *Vä*, or

Varjan (“upper people”); other Kalash peoples included the *Čima-nišei* and the *Vântă* (Strand 2011). These names may have a connection to the Kalevalan hero *Väinä* / *Väinämö* / *Väinämöinen*. The Kalash have a high degree of gender equality. A woman who wishes to separate from his husband only has to write a letter to his new husband candidate, telling that he wants to change husbands. This connects with the ancient cultures of the Nordic peoples, including the Vikings and the ancient Finns, as in both cultures women were responsible for making financial decisions and for leading the servants of the house. The Kalash have animistic beliefs and shamans, and value nature. This resembles the ancient Finno-Ugric cultures.

Evaluation of evidence:

The evidence concerning the migrations from the North Sea and Baltic Sea regions to the Indus Valley seems to be *tentative or moderate*, as it consists of coherent genetic, archaeological, and linguistic evidence. A potential counter-argument against this hypothesis is the existence of martial tribes like Scythians along the route from Volga–Kama to the Indus Valley, increasing the risks of travel. Yet, the Caspian Sea and the Volga River would have offered a relatively safe route for sailing and rowing, as the martial tribes of the steppe region tended to specialize in riding and not in boating.

4.10 Indus → Caspian → North Sea hypothesis

According to this hypothesis, *people from the Baltic region migrated to the Indus Valley 5200–200 BCE via eastern river routes*. The supporting evidence is presented below.

Linguistic evidence: As noted in the previous chapter, the Abhashevo culture and the related Sejma-Turbino network (2200–1900 BCE) were bilingual Proto-Finno-Ugric and Proto-Indo-Aryan. This indicates migrations from the Finno-Ugric

¹⁶⁰ Carpelan (2002) and Parpola (2012); referenced by Parpola (2017).

¹⁶¹ Tallgren (1916, 360), referenced by Ojala & Ojala (2022).

¹⁶² According to Lavento (2019, 36), “Finland can be described as a border zone between Scandinavian and eastern

cultural phenomena during the entire Early Metal Age (Bronze Age)”. This means that genes and artefacts that came to Finland from the west were likely to continue their way towards east, and vice versa.

regions to India and vice versa; not only migrations from north to southeast. This interpretation is supported by Holopainen (2019, 335–338), according to whom the Finnish language has adopted words from Indo-Iranian languages throughout the centuries and not only via the descent of words from some ancient, shared proto-language. In addition, the Finnish language contains many words that resemble Dravidian words (see p. 283). Although the dominant theory is that these words would have descended from a shared Siberian proto-language to, it is also possible that the Finnish and Dravidian languages have exchanged loan words several times during the last five millennia.

Genetic evidence: There is tentative genetic evidence concerning migrations from the Indus Valley to Scotland 710–206 BCE, although the route of these potential migrations is not known (p. 129). In addition, it is likely that the migrations from the North Sea and Baltic Sea regions to the Indus Valley along the Caspian route 5200–200 BCE would have induced also counter-currents of migration to the opposite direction. This interpretation receives some weak support from Ashby (2020), according to whom many Vikings still had a black hair at the end of the first millennium CE.

Archaeological evidence: In general, there is weak archaeological evidence concerning the migrations from India to the North Sea region, and strong evidence concerning migrations between the Volga-Kama region and Sweden. This stronger evidence comes from the geographic distribution of the Akozino-Mälär axes (1200–1000 BCE) and Ananino axes (800 – 400 BCE), which appeared on the area that reaches from Sweden to the Volga-Kama region. In addition, there is some weak or tentative evidence, which might connect India with Sweden. The rock paintings at the Bohus area in Western Sweden (1800–500 BCE) show human characters with erect penises and with horns in their head (Lawrence 2015). Both the erect penis and the horns are motives that appear in the Pashupati seal of the three-faced god at Mohenjo Daro, dated approximately to 2350–2000 BCE. It is possible that these motifs would have migrated from the Indus

Valley to southwestern Sweden 2000–1800 BCE via the Caspian–Volga–Baltic route.

In addition, the Gundestrup Cauldron, which was discovered in Denmark and dated to 200 BCE – 300 CE, shows an image of a horned character in a yogic position, which resembles the position of the three faced god of Mohenjo Daro. This could be interpreted as evidence concerning the connection between Denmark and the Indus Valley, but the metallurgy of the cauldron suggests a Thracian origin (Southeastern Balkans). In addition, according to Pathmanathan (1979, 51), the graves of Norway and South India resemble each other, as men and women were buried together with food, dishes and bowls. Pathmanathan, however, does not provide a sufficient description or dating of these similarities and is a relatively unreliable source (see p. 130).

Cultural evidence: According to Foghlu (2016), the Indians of Kerala still use similar C-shaped horns that the Irish and the Scandinavians used about 2000 years ago. This suggests a potential cultural connection via the Baltic–Volga–Caspian route.

Old traditions and unreliable histories: Several Norse sagas speak of the ancestral tribe *Æsir* who came to Scandinavia from *Asgård* [*Völuspá*, *Skáldskaparmál*, and *Ynglinga*]. It is possible to interpret the *Æsir* as Asians, and *Asgård* as a settlement in Asia. This matches with the Indus–Caspian–Volga–Baltic route.

According to *Taiu Bo Cualange* from the Book of Leinster, the Matriarch Cesair landed with her horde at Dunn-m Barcin in Bantry Bay that is also called Fin-tragh Bay. One name for this horde was *Fins* (Waddell 1924, 94). This suggests that the invaders would have arrived from *Finland*. The motif of a *matriarch leading the horde* matches with Kalevala, according to which Matriarch Louhi was the ruler of the Bothnic kingdom of the Finns, and personally led its military operations at the sea.

Indirect evidence: As there is tentative or moderate evidence of migrations from the North Sea region to India along the Baltic – Caspian – Indus route, this acts as weak or tentative evidence concerning the migrations to the opposite direction.

Evaluation: The *Weak or tentative* evidence that supports the Indus→Caspian→North Sea hypothesis has been summarized in Table 39 below. The problem of this evidence is that the archaeological evidence supports the migrations

from Volga-Kama region to the Baltic region, and linguistic evidence supports the migration of some words from India (or Volga-Kama) to Finland. Much weaker evidence is available for supporting the migrations from India to the North Sea region.

Table 39: Summary of the evidence concerning the Indus→Caspian→North Sea migrations 710–206 BCE

#	Type of evidence	Central evidence	Strength of evidence
1	Genetic (p. 145)	There were nine migration waves from the coasts of the North Sea to the Indus Valley along the Indus–Caspian–Volga–Baltic route 5200–350 BCE (GAHAH). This indicates migrations also in the opposite direction. In addition, there was migration from Eastern Afghanistan to the North Sea region 710–206 BCE (see p. 143). According to GAHAH data, the Kalash people of Eastern Afghanistan have a very high genetic similarity with the Scottish population (see p. 129).	Weak or tentative
		Many Vikings had a black hair at the end of the first millennium CE (Ashby 2020).	Very weak
2	Indirect	There is tentative or moderate evidence concerning the migrations from the British Isles to India via the Baltic→Caspian→Indus route. This can be interpreted as <i>weak or tentative</i> evidence concerning the migration of some people also to the opposite direction.	Weak or tentative
3	Archaeo-logical (p. 145)	The Netted Ware culture, which emerged at Upper Volga ~1900 BCE, covered mostly those rivers that connected Volga and the Baltic Sea (Parpola 2017). This suggests that the Baltic – Volga route was important already ~1900 BCE. Akozino-Mälar bronze axes 1200–1000 BCE have been found at the region that reaches from Norway to the Volga–Kama region via Finland (e.g. Kuzminych 1996). The Ananino axes, dated to 800–400 BCE, have been found within the region that reaches from Volga–Kama to Northern Sweden via Finland (Lavento 2019).	Weak or tentative
		The pictured slabs at the Bohus area (1800–500 BCE) show human characters with erect penises and horns in their head (Lawrence 2015). These motifs are also found in the Pashupati seal of Mohenjo Daro.	Very weak
4	Linguistic (p. 145)	The Uralic languages have adopted words from Indo-Iranian languages (Holopainen 2019), and some Dravidian words have migrated to the Finnish language. According to Parpola (2017), the Abhashevo culture and the related Sejma-Turbino network (2200 – 1900 BCE) were bilingual Proto-Finno-Ugric and Proto-Indo-Aryan.	Weak or tentative
5	Historical (p. 145)	The Indian king of the Suevi had sailed from India to Germania ~50 BCE. However, rowing up the river Volga does not exactly match with <i>sailing</i> .	Weak
6	Cultural	The Indian horns of Kerala resemble the ancient Irish C-shaped brass horns.	Weak
7	Legends and traditions	Three traditions support the migrations on the Indus→Caspian→North Sea route: 1) Jason and the Argonauts, 2) Norse stories of the Æsir of Asgård, and 3) Taiu Bo Cualange (p. 146).	Very weak
Total evidence		Weak or tentative	

4.11 Indian Hyksos hypothesis

The Indian Hyksos hypothesis is an extension of the India→ East Africa hypothesis. According to this hypothesis, *the Hyksos conquerors of Lower Egypt (1638 BCE) were Indian, Middle Eastern or East African successors of the Indus Valley civilization.*

Historical evidence

Pharaoh Senusret I ruled Egypt 1971–1926 BCE. According to Herodotus, Diodorus Siculus, and Strabo, he conquered the “whole world”, even Scythia and Ethiopia.¹⁶³ His son Senuseret II, who ruled Lower Egypt 1897–1878 BCE, received Asiatic visitors 1890 BCE. These visitors were called *Hyksos* (“Foreigner”), and their delegation was led by *Abisha the Hyksos* (Stantis et al. 2015). Soon after this visit, Egypt was already at war against the Hyksos during the reign of Senusret III who won a battle against the Hyksos in an unknown country called of *Sekmem*. The Indian migrations to Ethiopia around 1886 BCE¹⁶⁴ coincide with the appearance of the Asiatic Hyksos to the vicinity of Egypt. The Hyksos managed to conquer Lower Egypt around 1638 BCE and founded their new capital to Avaris (Stantis et al. 2015). This conquest could have occurred as a sudden surprise attack via the canal that connected Nile and the Red Sea. Alliances, politics, and bribery are alternative explanations of the raise of the Hyksos to power. Such methods should have been accessible to the Asians, as there was a large population of Asiatic immigrants in Egypt at that time. One more piece of weak evidence for this hypothesis is that the Hyksos rulers published a handbook of mathematics in Egypt (Morenz and Popko 2010, 104). As the Indus Valley culture was one of the most advanced cultures in the world in the field of mathematics at the time of the Hyksos conquest, the Hyksos could have been Middle Eastern or Kushite successors of the Indus Valley civilization.

Cultural evidence

The Indian Hyksos hypothesis receives some weak or tentative support from the following cultural similarities between the Harappan culture and the Egyptian culture.

1. Both Egyptians and Indians worshipped cow, sun, snake, and river. In India, the rivers Saraswati and Ganga were personified and worshipped as nourishers in a similar fashion as the Egyptians worshipped the river god Hapi of the Nile.
2. The Egyptian sun god Ra resembles Ravi, the Indian sun god. The Egyptian god Heru or Nar Heru originates from the Indian god Hari, which is also called Nara Hari in India and Naar Ari in Hebrew texts.
3. Both Indians and Egyptians considered lotus flowers as something sacred. In India, it symbolized wealth and fertility. In Egypt, the blue lotus flowers were offered to the deceased, and held in the hand as if they possessed the power to revitalize the dead and to bring them back to life.
4. When the Pharaohs of Egypt died, beating of one’s chest was a common way of showing mourning. This same custom appears also in Tribal Purilia in west Bengal.

In order to increase the value of these similarities as evidence for the Indian Hyksos hypothesis, one would have to prove that these similarities appeared soon after the Hyksos conquest of Egypt.

Evaluation

The combined strength of this evidence that supports the Indian Hyksos hypothesis remains *weak or tentative* as the historical evidence is somewhat speculative and as the appearance of the similar cultural features in Egypt could not be dated within this study.

¹⁶³ Source: Encyclopedia Britannica, Sesostris.

¹⁶⁴ GAHAH, Ethiopian (Ethiopian analysis: second event); Retrieved 2022-05-09.

4.12 *Atlantian metallurgy in Chad hypothesis*

The name of this hypothesis starts with the word *Atlantian* and not with the word *Atlantean*, in order to take some distance from Plato's story of Atlantis. According to this speculative hypothesis, *Indians colonized the shores of Lake Chad ~3000 BCE and brought along their knowledge of metallurgy, which led to the invention of iron and to the development of an Atlantian culture in West Africa.* The Indian migrants would have used the waterway from Lake Congo to Lake Chad to reach the Cameroon-Chad region. This region was an important trade junction, as it connected to the Atlantic Ocean via Niger River, to Uganda via gigantic Lake Chad and Lake Congo, and to Upper Egypt via Lake Chad. According to the *Atlantian metallurgy in Chad* hypothesis, the Cameroonians tried to make copper based on Indian knowledge of metallurgy, but due to the lack of copper ore, they accidentally invented iron around 3000–2500 BCE. This hypothesis receives support from the following pieces of relatively weak evidence.

Archaeological evidence

The Manding script of West Africa has a higher resemblance to the Indus Script than to the Egyptian pottery signs of the first dynasty or to the Indian megalithic pottery signs that appeared after the Indus Valley civilization (see p. 54). This suggests that there might have been a connection from India to West Africa already 3300–1300 BCE. According to Rajan (2023), iron objects from 3000–2500 BCE have been found in Sivakalai in southern India. On the other hand, iron metallurgy was applied in southern Chad 3000–2500 BCE without preceding copper metallurgy (Holl 2020, 16). This suggests that the knowledge of metallurgy would have been imported to southern Chad from some other region. The cultivation of Asian bananas started in Cameroon no later than 2500 BCE (Mindzie et al. 2002). This suggests potential migrations of ethnic

Indians to Cameroon directly from southern India, or from Uganda where Asian bananas were cultivated ~3220 BCE.¹⁶⁵ This suggests that iron might have been invented in Chad accidentally when trying to produce copper based on Atlantian metallurgical knowledge. This speculative interpretation receives support from the fact that copper ore is rare in West Africa, Chad, Cameroon and Central African Republic,¹⁶⁶ whereas iron ore is a common resource in West Africa. An alternative explanation is that iron metallurgy was first invented in southern India, from where it expanded to Chad 3000–2500 BCE. Neither interpretation explains why iron metallurgy did not expand to Northern India or to Northern and Eastern Africa already before ~1500 BCE. One explanation could be that iron was smelted only in Western Africa and Chad where iron metallurgy was considered a valuable secret. Therefore, the iron objects of southern India would have resulted from long-distance trade. Another potential explanation is that the Indians considered iron as “failed bronze” and did not like the idea that it had been invented by someone else (in Africa). This prejudice, combined with the tendency of iron to corrode rapidly in tropical environments, could have led to the belittling of the significance of iron. In addition, the benefits of iron weapons against bronze armor would not have been realized before bronze armor became common: In the absence of metal armor, there is not much difference in the deadliness of iron weapons and bronze weapons.

Genetic evidence

According chapter 4.5, the Fulani of West Africa and the Nadar of South India have a similar HLA system (p. 117). This indicates migrations from Southern India to Western Africa, or vice versa. In addition, based on GAHAH, the studied BiakaPygmy population of Central African Republic had a genetic match with the populations of the Indus Valley (Pathan 0.6%, Sindhi 0.5%, and

¹⁶⁵ The entry time of Asian bananas to Cameroon coincides with the estimated founding time of one of the largest megalithic concentrations at the eastern border of Cameroon. The earliest of these megaliths have been dated to ~2100 BCE (Zangato 1999; referenced by Delvoye (2021).

¹⁶⁶ Copper is not mined in West Africa, Cameroon, Chad, and Central African Republic according to [Wikipedia 2022-07-10](#). On the other hand, West Africa has large resources of iron ore ([U.S. Global Investors 2015](#)).

Burusho 0.3%) and with the South Indian population (0.4%). As the GAHAH data is relatively sparse at the continent of Africa, additional studies concerning Central African and West African populations might reveal even higher levels of similarity.

Linguistic and onomastic evidence

According to Sengkor (1974), the vocabulary relating to metallurgy and cotton spinning is the

same in some West African languages and in some Dravidian languages of India (see Table 30). This suggests that the vocabulary would have migrated from India to West Africa along with the knowledge of Bronze metallurgy. One of these shared words is *Kamara* (“Blacksmith’s caste”). The geographical distribution of *Kamara* as a forename supports the interpretation, according to which metallurgy would have arrived to West Africa from India via Central Africa (Figure 18 below).

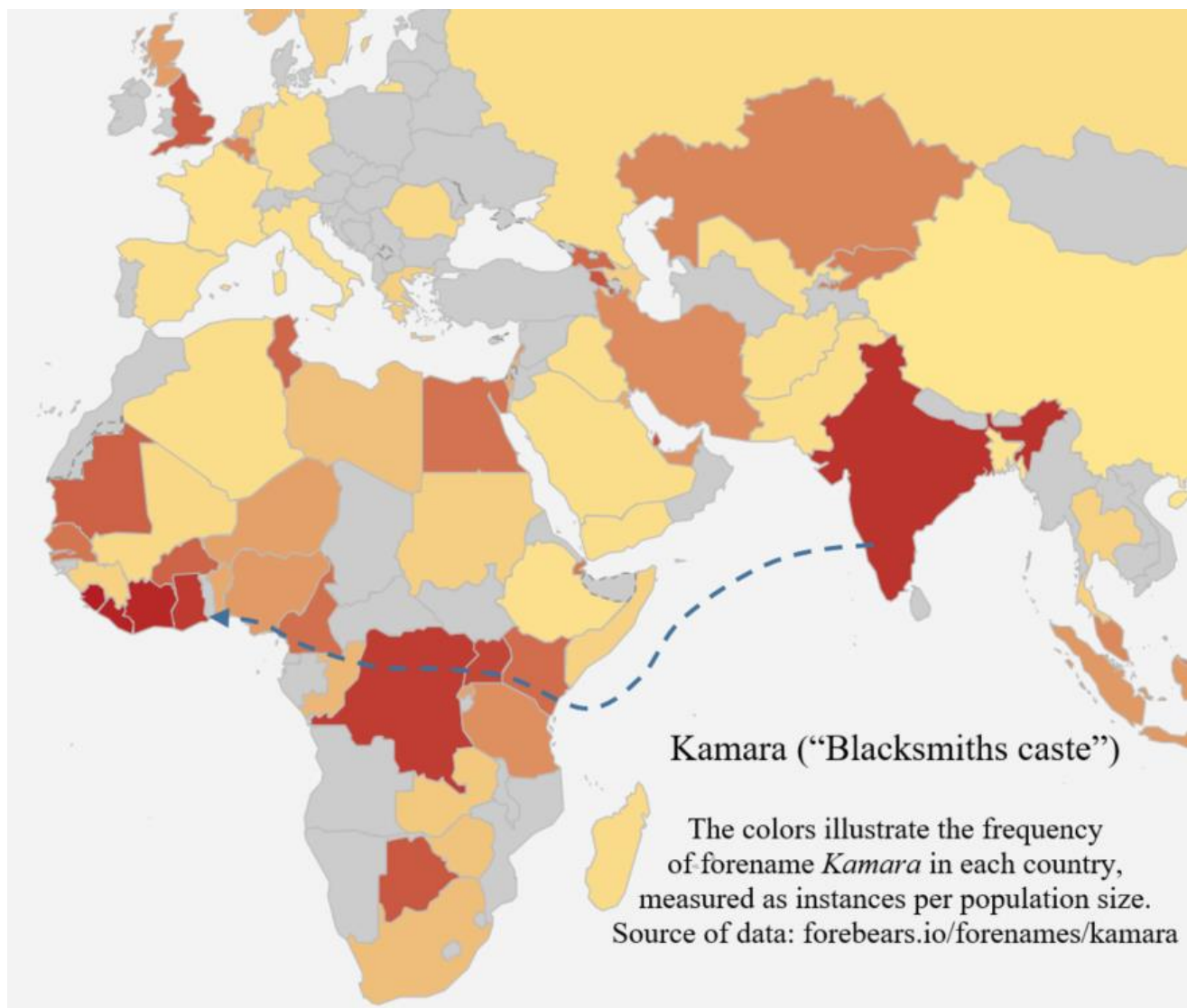


Figure 18: Geographic distribution of the name Kamara

According to Upadhyaya & Upadhyaya (1983), the words *king*, *cultivate*, and *boat* appear in similar form in the Dravidian languages of India, and in the Mande language of tropical West Africa (see

p. 121). This supports the idea of close cultural connection between India and tropical West Africa 3000–2500 BCE, which is the period when iron

metallurgy was invented in Chad¹⁶⁷ and when the cultivation of fruits and melons started in West Africa.¹⁶⁸ In addition, the geographical distribution of the forename *Kamara*, which means “Blacksmith’s caste” in Wolof and Telugu, matches with the hypothesis concerning the migration of iron metallurgy from India to West Africa via Kenya, Uganda and Congo

There seems to be an approximately 14% similarity between the Basque language of Iberia and the Kannada language of Western India (chapter 3.8). When this figure is inserted to the glottochronological equation, the result indicates that the Basque language would have diverged from the Dravidian language family around 2600 BCE (see p. 94). This would match with Indian migrations to West Africa ~3000 BCE, as the migration route could then have continued to Iberia 2600 BCE. Yet, a likelier scenario is that a group of Proto-Tamil-Kannada speakers would have migrated to Iberia 1500–500 BCE (p. 93–95).

The expansion of the African iron metallurgy to Europe and Anatolia from West Africa during the second millennium BCE receives tentative support from the West African, Etruscan, and Norwegian words for iron: *fari* (Hausa, West Africa), *firi* (Fulani, West Africa), *fer* (Wolof, Senegal), *fers* (Etruscan), and *fari* (Old Norse, Scandinavia). Based on this, the Latin word *ferrum* might have been inherited to Latin from Etruscans, who might have inherited it from West Africa where iron objects were fabricated already 2000 years before the Roman times.

Oral traditions and unreliable histories

The Fon people of Benin have oral traditions of their ancestral hero *Gu* who came to Benin in the form of an iron sword, and then changed into a blacksmith.¹⁶⁹ This legend matches with the introduction of iron to West Africa 3000–2500 BCE. It also connects tentatively to India, as the name *Gu* is more common in India than in Benin even if the incidence of the name is divided by

population size (see Figure 19). The Fon people live in *Benin*, and the forename *Benin* appears most commonly in India, Afghanistan, Ethiopia, DR Congo, and Nigeria.

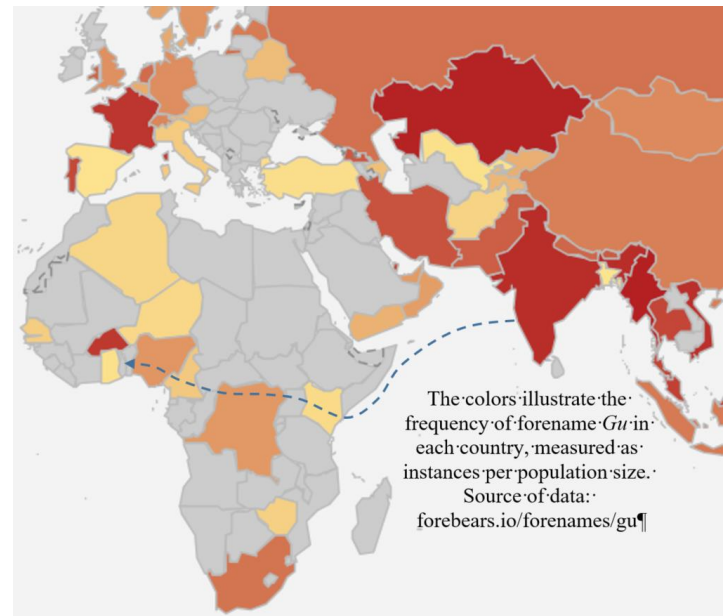


Figure 19: Geographic distribution of the forename *Gu*

According to Strabo [Geog. 17.160], some people claimed that the *Mauretanians* were originally Indians who would have arrived to Mauretania along with Hercules. Although the concept of Mauretania at the Roman times referred to coastal areas of Morocco, Tunisia, and Algeria, this concept was sometimes used to refer more widely to Northwestern and Western Africa. Therefore, the description of Strabo is in line with the idea that some groups of Indians would have migrated to Chad and West Africa 3000–2500 BCE. The anthroponym *Maure* appears most frequently in Nepal, India, and Sub-Saharan Africa.

According to Megasthenes (~300 BCE), the Indians had a legend according to which King Herakles of India traversed all sea and land, defeating evil tribes at the time when the first cities of India were constructed (see p. 113). These traditions would tentatively date the arrival of Indians to Africa to the

¹⁶⁷ Holl (2020,16)

¹⁶⁸ Mindzie et al. (2002) and Baker, D. “[The Origin of Agriculture in Africa](#)”, retrieved 2022-05-05.

¹⁶⁹ Britannica “[Gu Makes the World Habitable](#)”.

beginning of the Indus Valley civilization, 3300–3000 BCE. The story of King Hercules matches with the Roman belief, according to which the Mauretanians migrated to Africa along with Hercules (p. 139).

Atlanteans: According to Diodorus Siculus, the Atlanteans of West Africa had a very advanced culture at the time when they started the cultivation of fruit trees and the construction of cities [Libr. Hist. III.60]. This culture first expanded towards northwest (towards Morocco), and then to Sicily and Crete [Libr. Hist. III.61]. This description matches with a Berber legend, according to which their ancestors came from *Atala*, as there are still two places called *Atala* in the tropical West Africa (p. 125). According to Diodorus, the conqueror of Sicily was Cronus, and the conqueror of Crete was Zeus, who was not the same Zeus that the Greeks worship as a god. Based on these narrative elements, the events of this story would have occurred during the third or the second millennium BCE, assuming that they can be interpreted as historical events. According to Diodorus Siculus, King Atlas of the Atlanteans introduced the cultivation of fruit trees and the construction of cities to the local natives. This suggests that he would have come to the region as an immigrant. The names *Atlas* and *Atalas* are most frequent as anthroponyms in Pakistan.

Diodorus characterized King Atlas as a *very skillful astronomer*, which matches with Homer's description of Atlas as *possessor of frightening knowledge* and as a person who *connected the earth and sky* together (see p. 56).

Atlantia: According to Pliny the Elder, the Sub-Saharan Africa (Aethiopia) was called *Atlantia* before people started calling it Aethiopia [Nat. Hist. VI.35]. This suggests that there might have been once an *Atlantian* culture, which would have reached from the Horn of Africa all the way to West Africa. The anthroponym *Atlantia* is most common in South Africa.

According to Diodorus Siculus, the Atlanteans lived close to Cerne [Libr. Hist. III.54.4], and according to Cornelius Nepos, Cerne was located at the other side of Africa, at the same meridian as Carthage [Plin. Nat. Hist. II.36.106]. These descriptions

support the idea, that there once would have been an Atlantian culture close to the Cameroon–Chad region, where iron metallurgy was invented 3000–2500 BCE. This creates a weak connection from the Indus Valley culture to the Atlantians of West Africa, and dates this connection to the same time when iron metallurgy appeared in India, Chad, and West Africa.

Atlantis: According to Pliny the Elder, there was an island called Atlantis somewhere close to Cerne, which was located in front of Cameroon [Plin. Nat. Hist. II.36.106]. Pliny treated this island as a geographical phenomenon and did not connect it in any way to Plato's story of Atlantis.

If we were to find connections between the West African Atlantis with Plato's Atlantis, the following motifs would match with Plato: Atlantis had a huge population of elephants and the plain of Atlantis was protected from northern winds [Criti. 114e]. In addition, the plain of Atlantis was a maze of small islands that were separated from each other with narrow canals [Criti. 119a]. This matches with the form of the coastline in many countries in West Africa. Yet, no evidence of an advanced urban culture in West Africa 3000–1500 BCE has been found, unless we assume that Old Oyo would have been constructed thousands of years before its generally agreed construction time.

Phrygians: According to Diodorus Siculus, the Phrygians were a tribe that (originally) lived at the coast of *the ocean* [Libr. Hist. III.59.7]. The expression “the ocean” suggests that Diodorus was referring to the Oceanus, meaning the sea that surrounds Africa and Eurasia. According to Herodotus, the Phrygians dwelled in the southern Balkans, before they migrated to Anatolia. The exact date of this migration is not known, but it is believed to have occurred during the Bronze Age. This migration from west to east matches with Diodorus, according to whom the Atlanteans advanced towards Crete from the west. According to Souckova-Siegolová (2001), the first iron objects appeared in Turkey ~1800 BCE, but that did not yet start the replacement of bronze weapons with iron weapons. Based on the *Atlantian Metallurgy in Chad* hypothesis, the iron objects and the

knowledge of iron metallurgy might have arrived to Anatolia along with the Phrygians, who would have migrated to from the Atlantic coast of Africa.

Evaluation of evidence

According to the Atlantian metallurgy in Chad hypothesis, *Indians colonized the shores of Lake*

Chad ~3000 BCE and brought along their knowledge of metallurgy, which led to the invention of iron. This hypothesis is supported by weak or tentative evidence that has been summarized into Table 40 below.

Table 40: Summary of evidence in support of the Atlantian Metallurgy in Chad hypothesis

#	Type of evidence	Central evidence	Strength
1	Archaeological (p. 149)	Asian banana trees cultivated in East Africa ~3220 BCE (Leiju & al 2006, 104) and in West Africa no later than 2500 BCE (Mindzie et al. 2002). Iron metallurgy appeared 3000–2500 BCE in Chad without a preceding period of bronze metallurgy (Holl 2020, 16), which indicates importation of metallurgical knowledge from some other region. According to Rajan (2023), iron metallurgy appeared in southern India ~3000 BCE. West African and Indian techniques of dying, jewelry, and weapon metallurgy resemble each other (Upadhyaya & Upadhyaya 1983). The ankle rings, war hatchets, and daggers with ring-shaped hilts of Togo have notable similarities with the ones of India (see p. 119). The similarity of the Manding Script of West Africa with the Indus Script indicates a connection between West Africa and the Indus Valley culture (p. 54).	Weak or tentative
2	Genetic (p. 149)	The Fulani of West Africa have a similar HLA system as the Nadar of India (Winters 2012a). Based on GAHAH, the studied BiakaPygmy population of Central African Republic had a genetic match with the populations of the Indus Valley (Pathan 0.6%, Sindhi 0.5%, and Burusho 0.3%) and with the South Indian population (0.4%).	Weak or tentative
3	Linguistic and onomastic (p. 150)	The words for “Bronze”, “Forge” and “Blacksmith’s caste” are the same in Telugu (India) and in two West African languages (Sengkor (1974). The words <i>king</i> , <i>cultivate</i> , and <i>boat</i> appear in similar form in the Dravidian languages of India, and in the Mande language of tropical West Africa (Upadhyaya & Upadhyaya 1983). The geographic distribution of the name <i>Kamara</i> (“Blacksmith”) supports migrations from India to West Africa via Central Africa at the time of the invention of iron metallurgy in Africa.	Weak or tentative
4	Unreliable histories and related anthroponyms (p. 151)	The story of ancestral blacksmith Gu and the stories of Atlas and the Atlantians suggest that there might have been a relatively advanced culture in West Africa during the 3 rd and 2 nd millennium BCE.	Very weak
Total evidence			Weak or tentative

4.13 Summary, conclusions, and suggestions for further studies

According to the India–Africa–Europe theory, *long distance migrations via waterways occurred at various occasions and during various periods 3000–*

200 BCE. In this hypothesis, *long distance migrations* mean the migration of people, genes, or cultures at least 5000 km during less than 500 years. Based on archaeological evidence, there are signs of long distance trade over sea routes already 2300–1500 BCE (see 4.2). According to the Genetic Atlas

of Human Admixture history (GAHAH), there were migrations between the North Sea region and the Indus Valley 5218–346 BCE (see p. 143). In addition, there were maritime migrations from India to Namibia ~850 BCE and from Kenya and South Africa to Morocco and Iberia 710–234 BCE

(p. 118). Based on these long distance migrations, the first part of the India–Africa–Europe theory seems to be relatively well supported. The most likely migration route from India to Western Europe would have been the route around Africa (see Figure 20 below).

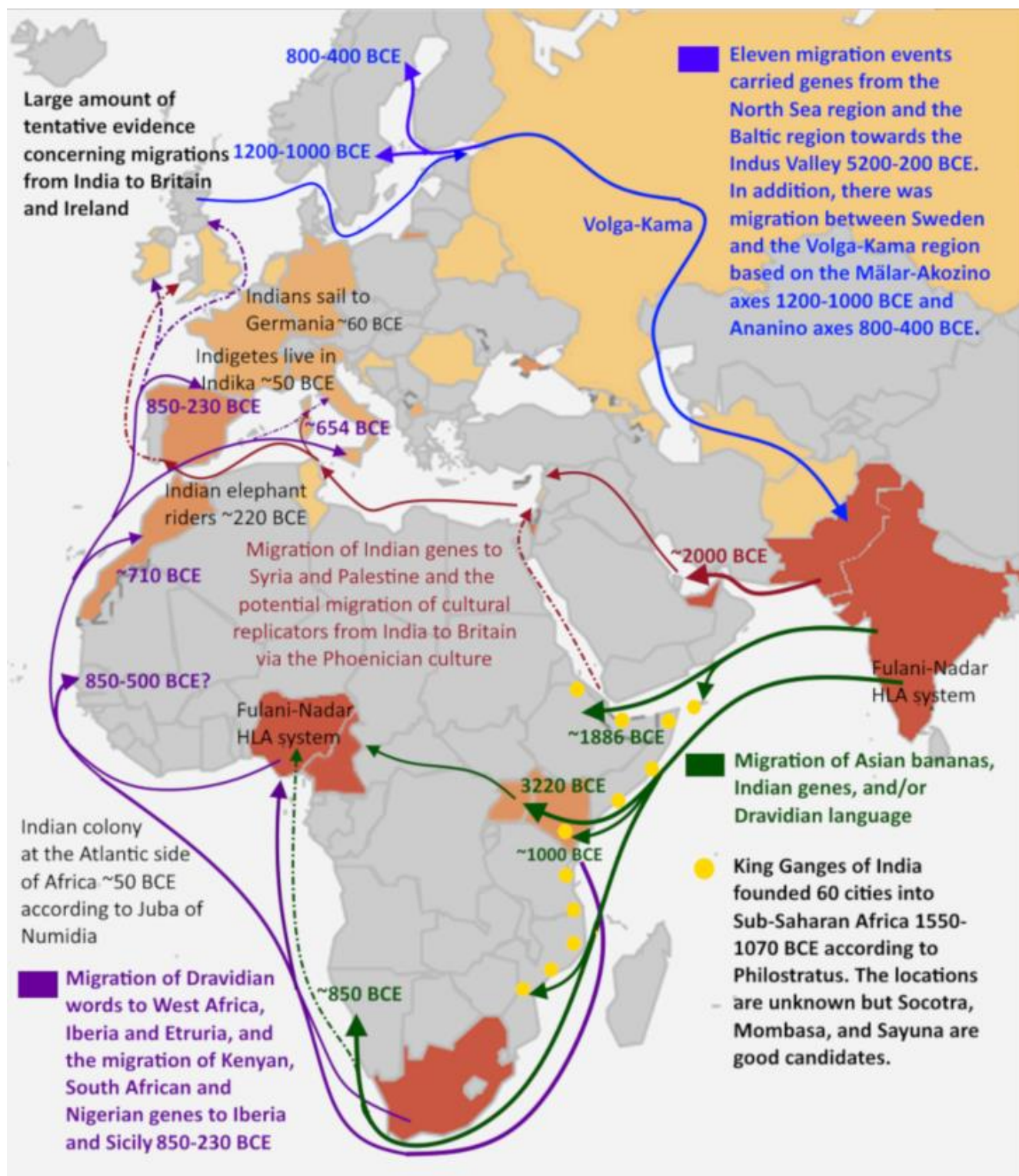


Figure 20: Migrations from the Indian Subcontinent towards Scotland 3000–200 BCE

On the map, thick arrows illustrate moderate or strong evidence, and the narrow and dotted lines illustrate tentative evidence. The evidence that supports each of the three alternative routes has been described in chapter 4.6 –4.6 and is briefly summarized below.

Migrations from India to East Africa and Western Europe around Africa

According to genetic and archaeological evidence, people from the Indian Subcontinent founded colonies to East Africa 3300–1800 BCE. The main evidence for these migrations are the Asian bananas that were cultivated in Uganda already 3220 BCE, and the GAHAH data, according to which there was migration from Kenya and Tanzania to India ~3034 BCE and from India to Ethiopia ~1886 BCE. In addition, the African sorghum millet migrated to India ~2500 BCE, which shows a cultural connection between India and Africa (see p. 113). The Indian colonies in East Africa reached as far as Mozambique based on al Idrisi, and as far as Namibia based on GAHAH. In addition, there seems to have been an Indian colony or state between the Lake Victoria and Mombasa in the first millennium BCE (see p. 112).

For the migrations from India to Western Europe via Sub-Saharan Africa, there are two alternative scenarios. The first of these scenarios would date the migrations to 3500–2500 BCE, and the second one to 1500–50 BCE (see Figure 20 p. 154). The earlier scenario, which is called *Atlantian metallurgy in Chad*, is somewhat unlikely, yet interesting. It is based on the following pieces of evidence:

1. The genetic and linguistic similarity of the South Indian *Nadars* and the West African *Fulani* (p. Genetic evidence117)
2. The archaeological evidence, according to which Asian bananas migrated to East Africa ~3220 BCE and to West Africa ~2500 BCE
3. The similarity of the Indus Script with the Manding Script (p. 54)
4. The linguistic and archaeological evidence that connects India and West Africa especially in the fields of metallurgy, cotton spinning, and seafaring (p. 120–123)

The genetic, linguistic, symbolic, and archaeological evidence opens up space for a hypothesis, according to which the people of southern Chad and Central Africa tried to make bronze based on Indian knowledge of metallurgy, and then accidentally produced iron ~3000 BCE. If we assume that this scenario is valid, then a large group of people from this West African culture might have migrated all the way to Iberia, starting the European Bell Beaker phenomenon. This scenario needs to be presented with the assumption that the Dravidian speaking West Africans would have considered iron an inferior metal compared to bronze due to its tendency to corrode in tropical conditions. This would explain why iron metallurgy did not spread to Europe along with the Indo-African Bell Beaker migrants (p. 149–149). The advantage of this speculative hypothesis is that it could possibly explain how the haplogroup R1b spread to Western Europe from tropical West Africa. It would also explain why some Romans believed that the Mauretanians had arrived from India along with Hercules (during the early Bronze Age), and why an Indian legend claims that the autochthonous Indian King Heracles traversed all sea and land at the time when the first big cities were built in the Indus Valley. It also matches with the writings of Diodorus Siculus, according to whom the Atlanteans of West Africa had a very advanced culture, which gradually expanded all the way to Sicily during the third or second millennium BCE (p. 152).

As the *Atlantian metallurgy in Chad* is a relatively unlikely scenario, a better timing for the Indian migrations to Western Europe around Africa would have been 1500–50 BCE. According to Philostratus, Indians founded 60 cities to Sub-Saharan Africa 1550–1070 BCE, and according to Homburger (1952), the Kannadas of India were in an influential role in a large Bantu state during the first millennium BCE. According to GAHAH, there was migration from India to Namibia ~850 BCE. This suggests that there may have been a chain of Indian cities at the Sub-Saharan coasts of Africa 1550–850 BCE, reaching as far as Namibia. This interpretation receives support from al Idrisi, according to whom half of the inhabitants of a city in Mozambique were still Indians around 1150 CE (p. 111). In addition, the name of the city of *Benguela*

in Angola seems to originate from the same root as *Bengal* in India. Angola is right next to Namibia, which received Indian immigrants ~850 BCE.

In addition, there is relatively convincing linguistic evidence concerning the migration of Kannadan and Tamil words and linguistic features to West African languages (p. 120–123) and some evidence of the lexical similarity of Kannada and Tamil with Basque (see chapter 3.8). Yet, there is practically no genetic evidence concerning the migrations of Indians to Maghreb or Iberia. One way to resolve this paradox is to assume that the Indian migrants were low in numbers, but very influential in their new homelands in West Africa and Europe due to the knowledge they carried along. This could explain the high cultural and linguistic effect, combined with a weak genetic effect. Another solution would be to assume that the Indians founded some relatively strong Proto-Tamil-Kannadan speaking colonies into Mombasa, Mozambique and South Africa 1550–850 BCE, but that these colonies Africanized genetically by 710 BCE. This year starts the period, during which the Kenyan and South-African genes started to flow to Morocco (~710 BCE), Sicily (~654 BCE), and Iberia (542–234 BCE, see p. 118). This could explain the *Indigetean* city of *Indika*, which existed in Catalonia according to Greek and Roman scholars and the appearance of the Indian anthroponyms such as *Indibilis* in Iberia (see p. 115–123). It could also explain the approximately 7–14% similarity between the Basque language and the Kannadan language, measured in the data of Lahovary 1963 (see p. 94).

Although the migrations of Dravidian speaking Africans to Maghreb, Iberia, and Sicily might have been more voluminous than the migrations of genetic Indians, there is still some evidence concerning point-to-point migrations that would have started from India. The migrations from India to West Africa around the Cape of Good Hope receive support from the similarity of the HLA system of the Fulani of West Africa with the Dravidian speaking Nadar of Southern India (see p. 117). In addition, there was an Indian colony at the Atlantic part of Sub-Saharan Africa still around 50 BCE according to Juba of Numidia (see p. 115). These clues support the interpretation, according to which genetic Indians would have migrated to East Africa at

relatively large numbers and to West Africa at somewhat notable numbers (see p. 131). Yet, the migration of Dravidian words, names, and customs to Western Europe could have been caused by the migration of Dravidian-speaking Indo-Africans. This means that the Indian chieftain, who sailed to Germania at some time before ~50 BCE, might have started his journey from West Africa and not necessarily from India.

Migrations to Western Europe via Mediterranean

Some pieces of evidence that support the route around Africa to Western Europe can be interpreted also as support for the migrations via the Mediterranean Sea. For example, the lexical similarity of Dravidian languages with Basque and the sailing of an Indian chieftain to Germania ~50 BCE can be interpreted as evidence concerning Indian migrations to Northwestern Europe via the Mediterranean Sea. The same applies to the genetic similarity of the Scottish population and the Kalash population and to the appearance of the Dravidian surnames and words in England. In addition, there is some historical evidence concerning Indian migrations to Catalonia. According to Strabo, Ptolemy, Mela, and Stephanus of Byzantium, the tribe of the *Indigetes* had a city called *Indika* in Catalonia (see p. 116). Although this could also be explained by migrations around Africa, the route from India to Catalonia via the Mediterranean Sea would have been faster. There is also weak or tentative evidence concerning the similarities between the Etruscan language and the Dravidian languages (see p. 137).

There are five scenarios concerning the usage of the Mediterranean route. According to the first one, the archaeological industry of ivory objects in Iberia 3000–2500 BCE would have been organized by the Indus Valley people. This scenario receives weak or tentative support from the fact that a large part of this ivory originated from Asia, and there is no evidence of Syrian elephants yet from this period. Yet, the appearance of Asian ivory in Iberia is better explained by a trading network that would have imported ivory to Iberia from Syria and not from India. According to the second scenario, a large

group of Indus Valley people would have escaped the draught of the Indus Valley to Western Europe approximately 1950 BCE via the canal that was built by Pharaoh Senuseret, who reigned 1971–1926 BCE. The weakness of this scenario is that the draught occurred 2200–2000 BCE and not ~1950 BCE. In addition, the Egyptians might not have permitted a large group of trespassers to use their canal. According to the third scenario, a large group of Indians migrated to Britain 1638–1523 BCE during the Hyksos rule in Egypt. This is based on the hypothesis, according to which the Hyksos would have been Indians. This would have opened a sea route from India to Britain via the Mediterranean Sea, but the Indian origin of the Hyksos is supported by only weak or tentative evidence (see chapter 4.11 and p. 211). According to the fourth scenario, the migrations would have occurred 600–400 BCE along the canal that connected the Red Sea and the Nile around ~600 BCE. The migrations from India to the Mediterranean region at that time receive tentative support from GAHAH, according to which there were migrations from the Indus region to Western Syria ~598 BCE, and to Palestine ~402 BCE. This scenario is also supported by the existence of the Achaemenid Empire, which joined Egypt and Indus Valley into the same Empire approximately 550 BCE. Therefore, there would not have been problems of trespassing the canal that connected the Red Sea and the Mediterranean Sea. All of these scenarios receive some weak or tentative support from the Dravidian loan words in the Etruscan language, and from the tentative connections between the Indian and Phoenician cultures.

The problem with the scenarios concerning migrations from India to Western Europe via the Mediterranean Sea is that they do not explain the appearance of Indian genes in Namibia ~850 BCE, or the high similarity of the Human Leucocyte Antigen system of the Nadar of India with the Fulani of tropical West Africa. In addition, they do not explain why Juba of Numidia reported an Indian colony at the Atlantic coast of Africa and why there are so many similar words in Dravidian languages and West African languages. This suggests that the migrations from India to Western Europe would have

most likely passed via the sea route around Africa; the Mediterranean route seems like a potential supplementary route. Yet, it is not possible to draw any final conclusions concerning the route of the migrations from India to Western Europe. The time for such conclusions is after the hypotheses of the model have been compared to the results of a systematic empirical study, which in this case is the study that is described in chapter 5. The evidence that supports the main migration paths from India towards Scotland is summarized into Table 41 (p. 158)

Migrations via the northeastern river routes

According to the distribution of the Akozino-Mälar axes and Ananino axes, there was migration between the Volga – Kama region and the Baltic region 1200–1000 BCE and 800–400 BCE (p. 143). These periods match with the genetic data according to which there were migrations between the Indus region and the North Sea region 600–400 BCE. In addition, there were a dozen of migration events, which carried genes from the North Sea region to the Indus region approximately 5000–350 BCE. Based on the counter-current principle (see p. 25), these migrations would have induced migrations also from the Indus region to the coasts of the North Sea. Yet, no clear evidence was found concerning migrations from India to the Caspian region, or from the Baltic region to Scotland at this time. This reduces the credibility of the Indus–Caspian–Volga–Baltic–North Sea route.

Weaknesses and the need for additional studies

Genetics: The weakness of the genetic evidence that supports the India–Africa–Europe theory is that it consists mainly of the genes of current populations (GAHAH), and there is little evidence that would show similarities in ancient Indian, East African, West African, and Western European genomes. In addition, some of the migrations that are indicated by GAHAH have been disputed. Due to this, comparisons of ancient genomes would be needed to fill the gaps. This may be challenging, as human genomes are less likely to be preserved for thousands of years in tropical conditions, for example, in Southern India and in tropical Africa.

Table 41: Summary of evidence concerning the main migration routes from India to Western Europe

#	Hypothesis	Central pieces of evidence	Strength
1	India→ East Africa hypothesis: <i>there were several migration waves from India to East Africa 3300–500 BCE.</i>	East Africa received banana trees from Asia ~3220 BCE (Leiju 2006), and exported sorghum millet to India ~2500 BCE (Boivin 2014). African genes migrated to India ~3000 BCE and Indian genes migrated to Ethiopia ~1900 BCE (GAHAH). Indians founded 60 cities to Africa 1550–1070 BCE [LOA 3.20]. There was an Indo-African Bantu state in East Africa in the first millennium BCE (Homburger 1952). A large amount of additional evidence has been presented in pages 109–114.	Moderate or strong (p. 113)
2	India→ West Africa hypothesis: <i>Indians founded a colony into tropical West Africa 3000–2500 BCE or 1550–100 BCE.</i>	The large amount of similar words in the Dravidian and West African languages suggests migration of Dravidian speakers from India to West Africa. The Fulani of West Africa have a similar HLA system as the Nadar of Southern India (Winters 2012a). Juba reported an Indian colony in the Atlantic coasts of Africa ~50 BCE [Plin. Nat. Hist. II.34.97]. The evidence for hypotheses 1, 3, and 4 supports also hypothesis 2.	Moderate (or tentative) p. 126
3	India→ Maghreb hypothesis: <i>Indian migrants arrived to Mauritania and Maghreb 1550–200 BCE via the route around Africa</i>	A large amount of Dravidian words seems to have migrated to the Wolof language that is spoken in Mauritania. Hannibal used Indians as elephant riders when he attacked Rome [Pol. Hist. 1.40.250]. The evidence for hypotheses 1, 2, and 4 supports also hypothesis 3.	Tentative (p. 127)
4	India→Africa→ Western Europe hypothesis: <i>a large group of Dravidian speakers sailed to West Africa at some point of time 1500–500 BCE and to Western Europe 1500–200 BCE</i>	According to Cornelius Nepos, a group of Indians sailed to Germania ~60 BCE and established a kingdom there (Plin. Nat. Hist. II.67 , Strab. Geog. 3.5). GAHAH shows a migration corridor around Africa to Namibia ~850 BCE, to Morocco ~710 BCE, and to Iberia 542–234 BCE. There are many similar words in Dravidian languages and Basque (p. 280). The evidence for hypotheses 1–3 and 5 supports also hypothesis 4.	Tentative (or moderate), p. 128
5	Indian Subcontinent→ British Isles hypothesis: <i>notable amounts of migrants from the Indian Subcontinent arrived at the British Isles 3000–50 BCE.</i>	There was migration from the Indus region to Scotland 710–206 BCE and the genetic match between the Scottish and the Kalash is 23% (GAHAH). At least 68 English surnames have a Dravidian origin. <i>Dravidian</i> was an Irish surname already during the ancient times (Hawkins 1967 , unreliable).	Tentative (p. 132)
6	India→Phoenicia hypothesis: <i>the Phoenicians received a part of their culture and genes from the Indian Subcontinent.</i>	Based on genetic evidence and strontium isotopes, there were migrations from India to West Syria during the 3 rd millennium BCE and again 600 BCE. The Dilmun culture of Bahrain was connected to the Harappan culture 2250–1650 BCE and the Phoenicians originated from Bahrain [Strab.16.3].	Tentative (p. 134)
7	India→ Mediterranean→ British Isles hypothesis: <i>there was some migration from the Indian Subcontinent to the British Isles via the Mediterranean Sea 3000–50 BCE.</i>	There were migrations from Eastern Afghanistan to Palestine, Syria, and Britain 600–400 BCE, when the canal of Nechos II connected the Red Sea and the Nile. There was a migration route from India to Maghreb ~220 BCE, and a trade route from Cartago to Britain ~500 BCE. The evidence that supports hypotheses 1 and 4 supports also hypothesis 5.	Tentative (p. 142)
8	Baltic→Caspian→Indus hypothesis: <i>people from the Baltic region migrated to the Indus Valley 5200–200 BCE via eastern river routes.</i>	According to GAHAH, 12 genetic admixture events carried genes towards India along the Baltic→Volga→Caspian→Indus route 3700–350 BCE (p. 143). The Kalash of Eastern Afghanistan share cultural features and traditions with early Nordic tribes.	Tentative or moderate (p. 145)
9	Indus→Caspian→ North Sea hypothesis: <i>people from the Baltic region migrated to the Indus Valley 5200–200 BCE via eastern river routes.</i>	The Uralic languages have adopted words from the Indo-Iranian languages during several periods (Holopainen 2019, 335-338) and from Dravidian languages. The pictured slabs at the Bohus area (1800–500 BCE) show human characters with erect penises and horns in their head (Lawrence 2015), which may have a connection to the Pashupati seal of Mohenjo Daro. Evidence that supports hypothesis 8 supports also hypothesis 9 based on the counter-current principle of migration.	Weak or tentative (p. 147)

Archaeology: There is some archaeological evidence that would date the migrations from India to Africa to 3000–1500 BCE or to 700–1200 CE but there are only a couple of old and unspecific archaeological sources concerning the similarities of the material cultures of India and Africa during the first millennium BCE (p. 119–123). This lack of specific evidence could potentially be addressed in future studies, in which the similarities of the war hatchets, daggers, and ankle rings of Togo to their Indian counterparts would be measured and dated. In addition, studies concerning the similarities of the techniques of dying, jewelry, and metallurgy in West Africa and Dravidian India might reveal more specific and well-dated evidence (p. 119–123). In addition, it would be valuable to date the artefact styles and megalithic features that seem to create a connection between India and Britain (p. 131).

Linguistics: The migration route around Africa is supported by relatively old sources like Homburger (1952), Sengkor (1974), Aravanan (1976), N'Diaye (1978), and Upadhyaya & Upadhyaya (1983). Due to this, additional studies concerning the lexical similarity of Dravidian languages with West African languages would be needed. In these additional studies, it would be interesting to formulate the word-lists in such a fashion that they include terminology that relates to kingdoms, seafaring, metallurgy, and clothmaking. This is based on the findings of Sengkor (1974) and Upadhyaya & Upadhyaya (1976), according to whom the West African languages share terminology with Dravidian languages especially in these areas. In addition, it would be useful to examine systematically the lexical similarities that Lahovary (1963) identified between Basque and the Dravidian languages in order to clarify what similarities have been caused by descent, chance resemblance, and word-loaning. For the loaned words, it would be important to analyze also the route of loanings, taking into account also the West African languages.

History and old traditions: From the point of view of historical sources, the problem of the India→Africa→Western Europe hypothesis is the uncertainty of the historical sources that describe

migrations from India to Western Africa and Western Europe. Although these sources tell about small scale migrations like *sailing from India to Germania to do trade* and of *colonies in Western Africa and Iberia*, the references concerning the colonies are not clear and accurate. For example, when Juba of Numidia reported an Indian colony at the Atlantic side of Africa, this could have also possibly referred to the eastern coast of Africa. When Stephanus of Byzantium reported the city of *Indika* (of the Indigetes) in Iberia, this reference was not clearly enough supported by other historical sources that would have clarified that the *Indigetes* or *Indicetes* originated from India. In addition, some of the historical sources that reported travel from India to Western Europe around Africa are very unreliable and vague, such as Homer, according to whom Odysseus sailed at the *sea that encircles Africa and Eurasia* and was frequently in contact with tribes that lived *at the opposite side of Africa* (see p. 124). Another example of such an unreliable source is Megasthenes, according to whom the *Indian King Heracles traversed all sea and land* and the Roman belief, according to which the Mauretanians came from India along with Heracles. Due to the unclear nature of these references, additional analysis of these sources would be needed. In this analysis, the starting point should not be that *all stories of long distance travel during the Bronze Age and early Iron Age are invented*. This belief and assumption should be questioned because there is relatively strong archaeological and genetic evidence according to which long distance travel via waterways was much more common than was previously thought.

Onomastics: This chapter presented weak or tentative onomastic evidence that connects India to Western Europe. Such evidence should be investigated in depth in additional studies, using the current distribution of the ancient names as a guideline concerning the potential *urheimat* of each of the studied names (see chapter 5). In addition, some strong but yet unverified claims concerning the connection of Ireland and India deserve additional investigations. For example, according

to Hawkins (1965, 28), the surname *Dravidian* was common among the first documented last names of Ireland. If this could be confirmed, it would act as strong evidence concerning the connections from India to Ireland. Although such confirmation could not be obtained in this study, the geographic distribution of the Dravi*/Travi* name family suggests that these names might have migrated to Western Europe around Africa already during the ancient times (see p. 130 and 117).

Paradigms and ideologies: In all fields of science, the criticism against the India–Africa–Europe theory can be constructed on the *Eurocentric-Localist* paradigm, which is presented in Figure 21 below. If the starting point is the assumption that maritime long distance migrations were impossible before European colonialism, then the conclusion will be that the evidence that supports such migrations is questionable and weak. This conclusion is supported by five memplexes of metamemes. According to *Eurocentrism* and *Cultural evolutionism*, the European (and Near

Eastern) cultures, in general, have always been more advanced than the African and Asiatic cultures, which means that the first sailors who sailed around the Cape of Good Hope must have been European. Based on the *over-emphasis on cognates* within comparative linguistics, the Indian and African scholars who have created lists of similar words in African and Dravidian languages can be classified as unreliable sources. When these memplexes are combined with the *declining popularity of diffusionism* in archaeology in the 1960's, the result is the conclusion that long distance maritime migrations did not occur before the Romans started trading with India during the first century BCE. However, it is possible to interpret the evidence given in this chapter also without relying on the Eurocentric-localist paradigm. This can lead to a contrary paradigm, according to which long-distance migrations were actually somewhat common already 3000–200 BCE. Based on this paradigm shift, coherent pieces of tentative (and moderate) evidence concerning long-distance migrations start making sense.

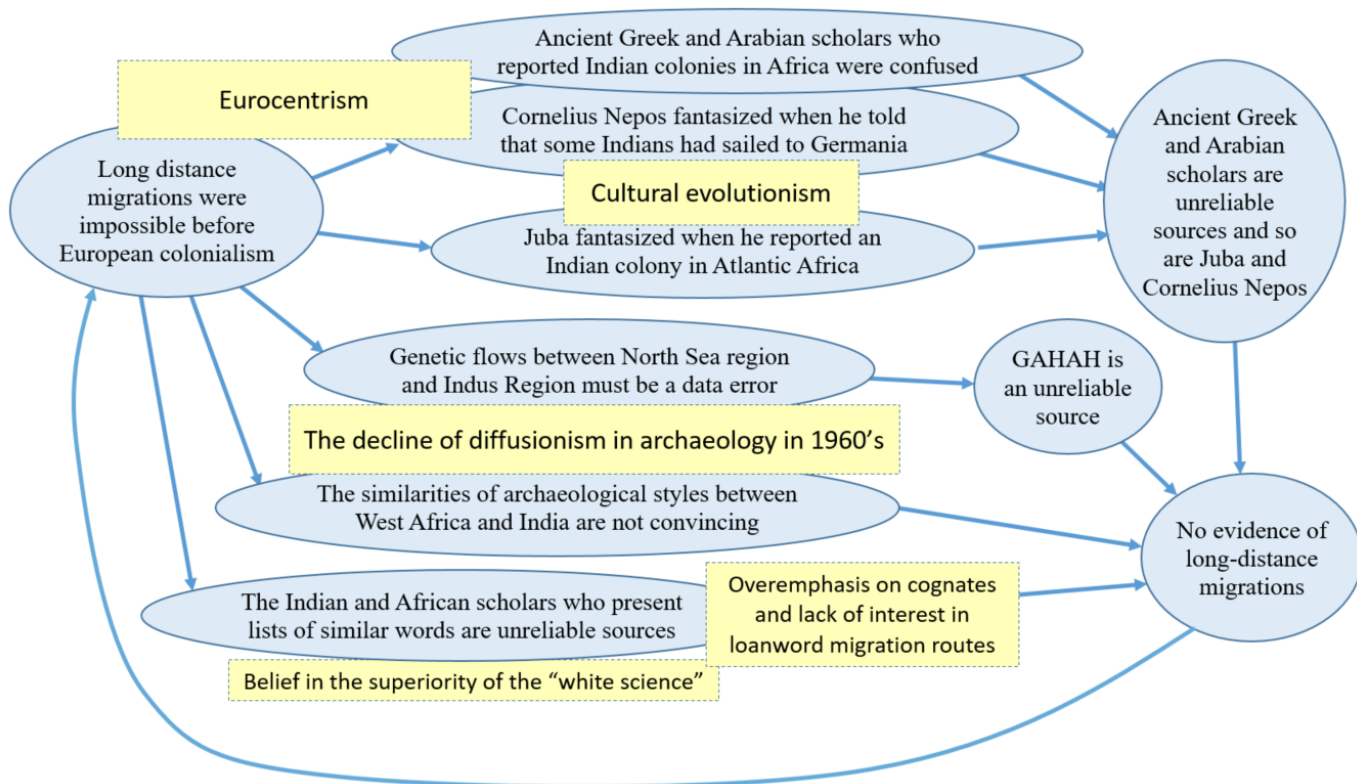


Figure 21: Eurocentric-localist paradigm for interpreting cross-scientific evidence

5 Testing the India–Africa–Europe theory against name data bases

5.1 Purpose and evaluated hypotheses

The purpose of this chapter is to test the India-Africa-Europe theory (chapter 4), and to reject or downgrade those hypotheses that do not receive support from the research data. No observations of this chapter have been used as additional evidence for increasing the credibility rating of the evidence that was presented in the previous chapter. This means that the potential methodological weaknesses of the study are not inflating the conclusions of chapter 4.

The testing (or evaluation) of the hypotheses is made along two paths. Firstly, the geographic distributions of ancient names are compared to the hypotheses of chapter 4. If no match is found, the credibility of the hypothesis is reduced. Secondly, three additional null-hypotheses were formulated.

Null hypotheses

The first null hypothesis was derived from the assumption that the Variation Rules of Table 42 are invalid. According to this null hypothesis, *the name families that that were created with the listed Variation Rules are not genealogically connected and therefore will not reveal any detectable urheimat; even if a potential urheimat could be identified, the appearance figures of the name family would not systematically decline when moving away from this urheimat.*

According to the second null hypothesis, the length of a name does not reduce the chance of the name being invented independently in parallel at different regions of the world. Therefore, *the long names and short names of a name set would have a similar geographic distribution.*

According to the third null hypothesis, *long distance migrations were rare during ancient times and therefore the high appearance of the same name set at distant locations is the result of modern migrations or chance resemblance.* Based on this null hypothesis, ancient name sets would appear mostly at their *assumed urheimat and in its adjacent*

regions. In addition, if a name set appears in some more distant regions, *no connecting migration paths can be identified*; in addition, the name set would not reveal a pattern according to which the appearance figures of the name set would decline systematically when moving away from the calculated urheimat towards the most distant appearances of the name set.

5.2 Method of the names study

The names study was divided into four phases, which are described below.

Preparation phase

Geographic scope: The first step of the preparation phase was the delineation of the *geographic scope* of the study to Eurasia and Africa, and by dividing this scope to *regions*, which are shown in Appendix table 4. Despite the focus on Eurasia and Africa, one exception was made. The name set of Inuit names was included into the study as a “control set”. In the case of the Inuit names, the Americas were included to the study of the geographical distribution of the name set.

Assumptions: The study relies on the assumption that names that are written with other scripts than the Latin alphabet have been transliterated into Latin alphabet in the onomastic databases and that the written form of these names has a relatively close match with the spoken form. This assumption is based on the International Phonetic Alphabet, which maps the Latin alphabet to phonetic sounds. In addition, it is assumed that names that exist in languages that do not have literature, are usually transliterated into Latin alphabet based on the phonetic sounds of the Latin alphabet.

Variation Rules: Based on these assumptions, a set of Variation Rules was confirmed in order to generate variants of the original names that were included of the name sets. These rules have been summarized to Table 42 (p. 163).

Name Sets: The next step of the preparation phase was the selection of the name sets of the study. The name sets were selected focusing at ancient anthroponyms. They were selected from India and Pakistan, which were the hypothetical urheimats of ancient migrations according to the India–Africa–Europe theory, and from the hypothetical destination areas, which covered Africa, Western Europe, Northern Europe, and the Middle East. Inuit names were added to the study as potential “control groups”, based on the assumption that migration from India to the homeland of the Arctic Inuit would have been rare. In a similar fashion, Greek names were added as a “control group” based on the assumption that since the eighth century BCE, the Greeks have had a relatively strong ethnic identity with some reluctance to promote names that would sound too Asiatic. Therefore, the hypothesis was that Indian influence in the Inuit and Greek name sets would have been small.

Implicit hypotheses can be derived from the way in which a name set was named in some external sources. For example, if the name of the name set includes the name of a Carrier (such as an ethnic group or a geographic region) then the name contains the implicit hypothesis that the *name set will have higher appearance figures within this named Carrier than within any other Carrier, if very famous names are excluded from the name set*. The exclusion of very famous names needs to be made, as internationally famous names that have a positive connotation have diffused globally during the modern times, making it difficult to study the authentic historical or prehistoric distribution of the name set. In addition, based on null hypothesis 3 that denies ancient long-distance migrations (p. 161), it is possible to conclude that *the any ethnic name set would have its second highest appearance figures in the regions that are adjacent to the assumed urheimat*. The studied name sets and the related implicit hypotheses are listed in Appendix table 5 (p. 229).

Databases: The fifth step in the preparation phase was the selection of the name databases, from which the names of the selected name sets would be searched. Mapcarta.com was selected as the

database of place names, as it contained a good amount of variants for each place name so that the original name that was searched for, could appear either as an *identical name* of a place, or as a variant for the same place. For anthroponyms, the alternatives were Namesdir.com, Namespedia.com, and Forebears.io. Out of these alternatives, Forebears.io was selected, as it offered a detailed geographic distribution of each forename and surname, and as it automatically proposes variants when the original name is typed into the search field.

Data collection phase

Each name set was constructed via three steps, which were the selection of the original names of the name set, the generation of variants, and the documentation of the those forenames, surnames, and place names that were found in the databases.

Original names: After the name sets had been selected, the original names of each name set were selected, either by taking all names mentioned in an existing relatively short list of names or by sampling a longer list of names. Only names with at least *five letters* or at least *three different consonants* were accepted. Names of four letters were used in the study of small name sets as auxiliary data, which was not used to deduce the urheimat of the name set, but which was used in some cases for the illustration of potential migration paths. In future studies, the sampling could be based on the amount of syllables or sounds, not on the amount of letters. However, relatively good results have been obtained also from studies in which words were mechanically handled as strings of letters without analyzing sounds and syllables (e.g. Holman et al. 2011).

Minimum Similarity: For each name set, a *Minimum Similarity* threshold was set for guiding the way in which the original names were extended to larger name families. For the name sets of less than 20 original names, the Minimum Similarity was set to 75%, whereas for the name sets of 20–80 original names it was set to 80%, and for some very big name sets the threshold was set to 100%. This means that for the small name sets, the variants were permitted to be three small steps away from the original focal name, and for the name sets of 20–80

names two small variation steps were the maximum permitted *RouteLength* (see p. 61).

Generation of variants: Table 42 below shows the Lexical Variation Rule set 0.8, which was a bit less developed than the final 1.0 rule set, which is shown in Table 19 (p. 85). As the Variation Step Lengths were longer in the Rule Set 0.8, fewer variants were

generated from the original focal names than if the Rule Set 1.0 would have been used. This means that the results are more conservative and contain variants that have a shorter variant distance on average than if rule set 1.0 would have been used.

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Table 42: List of Variation Rules for altering word W1 into W2 (rule sets 0.8 and 1.0)

#	Rule and example	Variation Step Length in Rule Set 0.8	Variation Step Length in Rule Set 1.0
1	Substitute a phonetic character with its alternative representation: ph/f, z/ts, q/qu	1	0 for ph/f 0.5 for others
2	Substitute one character of the name with a Close Peer that represents the same stereo-concept out of the following list of stereo-concepts: CKQ, KG, PB, and FV	1	0.1 – 0.55 (see p. 49)
3	Duplicate a letter: caro → carro or vaka → vaaka	1	0.5
4	Convert a double consonant to a single consonant or a double vowel to a single vowel	1	0.5
5	Convert a vowel into a diphthong or vice versa	1	1
6	Add into the name a vowel that already exists in it	1	1
11	Add or remove a prefix or suffix: Gadeirus → Gadeir	0	0
12	Extend a word by adding a character to its end or beginning, or remove a character from the end or beginning of a word	1	1
13	Add several characters to the end of a word that has at least 4 characters	2	2
14	Add or remove a component of the name: Sakir-Har → Sakir	2	2

The Variation Rules were applied to the focal names by entering the focal name to Forebears.ie and Mapcarta.com. If longer variants of the same name were proposed by these databases, these variants were accepted to the research data if the similarity of the variant was at greater or equal than the Minimum Similarity. After this, letters were removed from the end of the original focal name in the database searches in order to find other empirically existing variants that would have had at least the Minimum Similarity with the original focal name. An additional requirement was that variants with less than five letters were not accepted to the

research data. At the end, variation rules 1–6 and 8 were applied to the these discovered names, accepting to the research data all those names that appeared as a place name or anthroponyms in the databases and whose similarity with the focal name was at least Minimum Similarity.

Documentation of incidences: Every time that *Forebears.ie* showed an acceptable variant, the incidence of that name in each country as a surname was documented, starting from the country of highest incidence, which was marked as the mode country. This was then repeated for forenames. After this, the acceptable variants that were revealed

by Mapcarta.com were documented, mentioning the location and the type of incidence. All place names that appeared in the Americas were ignored, as these names would have most likely been carried to Americas by migrants after the European Middle Ages. Due to same reason, also all anthroponyms that had their highest incidence in the Americas were handled so that the American countries were ignored and the first Eurasian or African country with the highest incidence of the name was marked as the mode country. This can be justified by the voluminous migrations from Europe to the Americas after 1500 CE, and by the unlikely migration of the European and African names to the Americas before the first millennium CE. Due to these factors, the appearance of European or African names in the Americas cannot be used for analyzing earlier migrations.

Place names that referred to companies and suburbs were ignored, as they have often been invented during the modern times and only in some cases have a relation to an ancient name. Homesteads and pastures were ignored, as they are often derived from the name of their owner, and as their names tend to change much more easily than the names of natural formations like mountains, rivers, and lakes. Buildings, churches, and temples were ignored, unless they were very ancient (ruins). Wells that have a name were not ignored, as some wells are thousands of years old and as the tradition of giving names to wells is somewhat uncommon in the modern times. In future studies, wells could be ignored, or given a lower weight.

The discovered names within each name set were summarized into a data table, which showed the incidence of the name as an anthroponym in different countries and the incidence of the focal name as a place name in different countries (see example in Appendix table 19). In this table, short names of six or more letters were separated from the short names of five letters and of the very short names of less than five letters. The most valid

distinction between short and long names would have been made based on the amount of phones (not letters) but in general, the amount of letters had a clear correlation with the amount of phones. For example, the name *Chara* contains five letters and four phonemes, but when its first phoneme (affricative /ch/) is analyzed, it actually contains of two separate phones, which are /t/ and /ʃ/. That means that the amount of letters and phones is the same. For future studies, it should be possible to create reproducible and automatable rules for calculating the amount of phones in a name, including also those cases in which it is unknown to which language or culture the name belongs. As a temporary solution, the amount of letters was adjusted to match better the amount of phones by substituting the grapheme “ph” with “f” when calculating the lengths of names. Double consonants and double vowels were considered as two separate phonetic characters when calculating lengths.

Data calculation and illustration phase

The purpose of this phase was to calculate urheimats of the name sets and then illustrate the appearance of the names in different geographic regions. The first step was to calculate the *Appearance* of the name set in each region (see p. 61). The appearances were calculated based on the appearance of each name of the name set as forename, surname, and toponym in each region. Long names were given more weight than short names by calculating separately the Appearance of all names (excluding the very short ones) and the Appearance of long names. Very short names were ignored from the calculations. In the illustrations, the appearance of the long names was shown as the integer part of the appearance figure, and the appearance of all names was presented as its “decimal part”. The place names were given much more weight in these calculations by using the following equation for Appearance within each region of the geographical scope of the study:

$$Appearance = \sum_{name=1}^N (ToponymAppearance + ForenameAppearance + SurnameAppearance)$$

In this equation, each toponym of the name set counted as one appearance, whereas tens of thousands of forenames counted as one single appearance if this forename was more common in the region than anywhere else. In a similar fashion, a surname counted as one appearance, if it was more common in the region than anywhere else. For example, let us assume that name X appeared most frequently in Bell Beaker Europe and as a forename, most frequently as a surname in the Middle East, and as a toponym two times in Bell Beaker Europe. This means that the appearance of name X in Bell Beaker Europe would have been $1 + 2 = 3$. In addition to the Appearance figures, the study made use of the following variables and functions.

Frequency (Name, Country) was calculated by *Forebears.ie* by dividing the incidence of a specific surname or forename in each country by the population size of the country. This variable, which measures the relative frequency of the surname or forename in each country, was used for spotting Countries of especially high density of the name, compared to the size of population. The countries of highest density were illustrated in the maps with italic text. These areas of high frequency were used in the plotting of the migration arrows that headed outwards from the calculated urheimat. (Areas of high frequency but yet low incidence would have been likely colonies of the culture that existed at the urheimat).

GeoDensity (Region, Nameset) was calculated as the *Appearance (Region, Nameset)* divided by the surface area of the region, multiplied by billion. This multiplication was done to get comprehensible integer results instead of long decimal numbers.

PopDensity (Region, Nameset) was calculated as *Appearance (Region)* of the name set divided by the population of the region, multiplied by billion. This multiplication was done to get comprehensible integer results instead of long decimal numbers.

The *Appearance*, *GeoDensity*, and *PopDensity* were calculated separately for the longer names (at least six letters), and for all names (including also the five letter names). After calculations, the regional appearances were plotted to the map at each region

in such a fashion that the appearance of longer names was shown as the integer value of the appearance figure, and the appearance of all names was shown as the decimal value. In addition, all place names of the name set were plotted on the map, excluding some cases in which the place names were extremely common in their urheimat (e.g. the incidence of ancient Indian place names in India). The plotting of place names helped in the spotting of outliers, which were then rejected if a brief study of their origin showed that the names were of modern origin. Yet, it is likely that the data still contains many modern place names that have no connection to some ancient root.

Deducing the urheimat of a name set based on its current distribution

The urheimat conclusions that were made based on the name set data relied on the following assumptions that were derived from the DH theory:

- 1) A large proportion of anthroponyms in all Neolithic and later civilizations have been loan names or opaque names that have been derived from some other name by shortening, extension, or phonetic change (see 3.2, p.78). When a name is opaque, it is no longer carried by a *language*; it is carried by people and by cultures and these people and cultures may be multi-lingual.
- 2) Based on assumption 1, it is possible to generate name families from the original focal names based on Variation Rules, and to study the geographic distribution of these families without studying their etymology first. If an etymological study is considered necessary, it should be done after first studying the geographic distribution of these variants because the knowledge of this distribution can help in the identification of the regions and languages from which the etymological roots of the names should be searched (see chapter 3.6).
- 3) A notable proportion of current anthroponyms still resemble the way in which the name was pronounced 3000 years ago (see chapter 3.3).
- 4) Long anthroponyms, which are currently written with at least six letters, have not been invented separately at different regions of the world, as six letters is already so complex that

chance resemblance is unlikely. If such names are found at different regions, the likely explanation is migration or a tight cultural connection (e.g. via the exchange of stories that carry the names of their protagonists).

- 5) The extinction rates of traditional and ancient names at different regions are relatively similar (as assumed in glottochronology), or we know some specific periods of high extinction rate of the local ethnic names due imperialist conquest or due to religious fundamentalism (see p.77–78).
- 6) Although the deduction of an urheimat for one single name is risky based on its current geographic distribution, it is safer to deduce the urheimat of a larger name set based on its current geographic distribution (see chapter 2.4 and 2.5).

Based on these assumptions, it is possible to deduce the likely urheimat of a name set based on its current geographic appearance in the form of anthroponyms and place names, measured by the *Weighted Urheimat Indicator* (WUI, see p. 63). Below is a summary of the weights and thresholds that were used for calculating WUI:

- Highest appearance of long names, weight = 2
- Highest appearance of all names, weight = 2
- Highest GeoDensity of long names, weight = 1
- Highest GeoDensity of all names, weight = 1
- Highest PopDensity of long names, weight = 1
- Highest PopDensity of all names, weight = 1

After the WUI had been calculated, the region with the highest WUI was concluded as an urheimat-candidate and WUI was treated as a measure of the *Reliability* of the urheimat conclusion: Values over four were considered relatively reliable, as no region could reach such a high WUI only based on large surface area, big population, and high appearance figures. (To reach a WUI over four would require also highest GeoDensity and/or highest PopDensity).

Once the urheimat-candidate had been identified, the *Reliability* of the urheimat conclusion was converted into *Total Reliability* based on Weighted LCA (see p. 62–65), which was applied based on estimated travel times without taking sea and river current effects or winds into account. If the Weighted LCA located the urheimat to the urheimat-candidate region, Total Reliability was set as Reliability plus one, and if the Appearance figures were systematically declining when advancing away from the urheimat-candidate, then Total Reliability was set as Reliability plus two. The Total Reliability scores were matched with verbal descriptions so that Total Reliabilities over six were considered reliable and below six as unreliable. Total Reliability of six was considered an indicator for a good urheimat candidate.

Deducing the migration routes

After the identification of the urheimat of a name set, the data was illustrated using the principles that have been presented in chapter 2.5 (p. 65). The migration paths were drawn outwards from the urheimat region as dotted curvy lines that connected Points of Interest (POI), which contained variants of the name that was most common in the urheimat. Once the urheimats of the name sets had been calculated and migration paths had been illustrated, the name sets were used for concluding migration routes from the Indian Subcontinent to Europe and Africa by using the criteria that are described in chapter 5.13.

5.3 Overview of the studied name sets

The study covered 26 name sets. The sizes of the name sets are measured by the amount name families and names. The name families are groups of names that contain the original name and its variants that were derived by the Variation Rules of Table 42 (p. 163).

Table 43: The name sets that were covered by the study

Name set	Reference (page)	Name families (at least 5 letters)	Names included in the name families			
			Total	Long names (> 5 letters)	5 letters	Short names (< 5 letters)
Ancient West African	248	25	64	50	12	2
Archaeological West African	245	28	39	30	9	0
Berber and Libu names	253	31	66	41	25	0
Catalan	260	14	56	38	18	3
Druidic	261	27	55	41	13	1
Ethiopian	240	32	32	18	14	0
Etruscan	258	79	105	69	36	0
Euhemerian	175	9	39	21	12	6
Fulani	246	40	40	40	0	0
Gadeir* names	268	1	23	18	5	0
Hyksos names	242	9	29	16	12	1
Iberian	255	23	36	29	7	0
Indigeteian	256	14	45	39	6	0
Indo-Asiatic	238	20	20	13	6	1
Inuit	233	22	34	13	16	5
Kalevalan	257	27	46	30	11	5
Kushite	243	17	42	30	6	6
Legendary African	250	17	18	6	4	8
Legendary Indian	266	10	59	32	17	10
Legendary Irish names	276	22	52	32	12	8
Mitanni	237	11	16	9	6	1
Norse Gods	264	47	52	20	32	0
Phoenician	234	61	106	76	30	1
Potentially Atlantean names	271	12	92	56	32	4
Sea People names	251	11	41	33	8	0
Traditional Greek	231	29	41	21	8	12
Total		665	1247	816	357	72

Table 44 below shows the likely urheimats of these name sets based on the *Weighted Urheimat Indicator* (WUI), which was calculated based on the Appearance, GeoDensity, and PopDensity figures (see p. 164). Corded Ware Europe has been

abbreviated to CW Europe, Bell Beaker Europe to BB Europe, and West Africa to W. Africa. The Total Reliability was calculated by adding zero, one, or two reliability points to the WUI depending on the results of the Weighted LCA

Table 44: The likely urheimats of the 26 name sets that were covered by the study

Name set	Highest appearance Letters>5	Highest appearance Letters>4	Highest Geo-Density Letters>5	Highest Geo-Density Letters>4	Highest Pop-Density Letters>5	Highest Pop-Density Letters>4	Maximum WUI	Urheimat (and Total Reliability)
Inuit, 171	North America	Sundaland	Gedrosia	Sundaland	North America	CW Europe	Sundaland (3), North America (3)	Eastern Asia (?)
Traditional Greek, 170	Balkans & Crete	Balkans & Crete	Balkans & Crete	Balkans & Crete	Balkans & Crete	Balkans & Crete	Balkans & Crete (8)	Balkans & Crete (8+1)
Kalevalan, 194	CW Europe	CW Europe	CW Europe	CW Europe	CW Europe	CW Europe	CW Europe (8)	CW Europe (8+2)
Old Norse, 195	CW Europe	CW Europe	CW Europe	CW Europe	CW Europe	CW Europe	CW Europe (8)	CW Europe (8+0)
Legendary Irish, 198	BB Europe	BB Europe	BB Europe	BB Europe	BB Europe	BB Europe	BB Europe (8)	BB Europe (8+0)
Catalan, 191	BB Europe	Ext. India	BB Europe	BB Europe	Balkans & Crete	Balkans & Crete	BB Europe (4)	BB Europe (4+0)
Legendary Indian, 174	Ext. India, BB Europe	Ext. India	Balkans and Crete	Balkans and Crete	Balkans and Crete	Balkans and Crete	Balkans and Crete(4)	Balkans and Crete(4)
Druidic, 196	Ext. India	Ext. India	BB Europe	BB Europe	BB Europe	BB Europe	Ext. India (4) BB Europe (4)	Ext. India or BB Europe
Indigetean, 189	Ext. India	Ext. India, Sundaland	Sundaland	Sundaland	Balkans & Crete	Balkans & Crete	Ext. India (3) Sundaland (3)	Ext. India (3+2)
Ethiopian, 179	Ext. India	Ext. India	Balkans & Crete	Japan & Koreas	Balkans & Crete	Maghreb	Ext. India (4)	Ext. India (4+0)
Phoenician, 178	Ext. India	Ext. India	BB Europe	Ext. India	Balkans & Crete	Balkans & Crete	Ext. India (5)	Ext. India (5+1)
Etruscan, 192	Ext. India	Ext. India	Balkans & Crete	Ext. India	Balkans & Crete	Balkans & Crete	Ext. India (5)	Ext. India (5+2)
Iberian, 188	Ext. India	Ext. India	Ext. India, Sundaland	Ext. India	Sundaland	Balkans & Crete	Ext. India (5.5)	Ext. India (5.5+2)
Hyksos, 180	Ext. India	Ext. India	Ext. India	Ext. India	Ext. India	CW Europe	Ext. India (7)	Ext. India (7+2)
Kushite, 181	Ext. India	Ext. India	Ext. India	Ext. India	CW Europe	CW Europe, Maghreb	Ext. India (6)	Ext. India (6+1)
Mitanni, 178	Ext. India	Ext. India	Ext. India	Ext. India	Sundaland	Kurgan Europe	Ext. India (6)	Ext. India (6+2)
Euhemerian, 175	Ext. India	Ext. India	Balkans and Crete	Ext. India	Balkans and Crete	Balkans and Crete	Ext. India (5)	Ext. India (5+2)
Indo-Asiatic, 172	Ext. India	Ext. India	Ext. India	Ext. India	Gedrosia	Gedrosia	Ext. India (6)	Ext. India (6+2)
Berber and Libu, 187	Ext. India	Ext. India	Ext. India Sundaland	Ext. India	Maghreb	Maghreb	Ext. India (5.5)	Ext. India (5.5+2)
Gadeir*, 200	Ext. India	Ext. India	Ext. India	Ext. India	Maghreb	Maghreb	Ext. India (6)	Ext. India (6)
Atlantean, 201	Sundaland	Ext. India	Sundaland	Ext. India	Maghreb	Maghreb	Ext. India (3) Sundaland (3)	Ext. India (3+2)
Ancient West African, 184	Ext. India	Ext. India	Ext. India	Japan & Koreas	W. Africa	W. Africa	Ext. India (5)	Ext. India (5+1)
Sea People, 186	Ext. India	Ext. India	Ext. India	Ext. India	W. Africa	W. Africa	Ext. India (6)	Ext. India (6+1)
Legendary African, 185	Central & S. Africa	Central & S. Africa	East Africa	East Africa	Central & S. Africa	Central & S. Africa	Central & S. Africa (6)	Central & S. Africa (6+2)
Fulani, 183	W. Africa	W. Africa	W. Africa	W. Africa	W. Africa	W. Africa	W. Africa (8)	W. Africa (8+2)
Archeological West African, 182	W. Africa	W. Africa	W. Africa	W. Africa	W. Africa	W. Africa	W. Africa (8)	W. Africa (8+2)

If the urheimat that was estimated based on Weighted LCA matched with the urheimat that was indicated by WUI, then one point was added to Total Reliability. In addition, if the Appearance figures declined systematically when moving away from this urheimat, then one additional Total Reliability point was added. If two regions shared the same highest WUI, then Weighted LCA was used for determining which of these urheimats would have been more likely. In that case, the Weighted LCA points were added to the likelier urheimat region. The results concerning the traditional Greek, Kalevalan, Old Norse, and Legendary Irish names were as expected; their likely urheimat is in Europe. However, the calculated urheimat of the Mitanni, Phoenician, Hyksos, Kushite, Ancient West African, Berber & Libu, Iberian, Etruscan, and Sea People name sets is located in India. This provides some preliminary support for the India–Africa–Europe theory, and indicates that the migration arrows of these name sets should be drawn from the Indian Subcontinent towards other regions. A more detailed analysis of the name sets is provided in the next chapters.

5.4 Inuit names and traditional Greek names as “control groups”

Two name sets were selected as control groups in order to evaluate null hypothesis 2 according to which *the long names and short names of a name set would have a similar geographic distribution* (p. 161). Another evaluated hypothesis was null hypothesis three (p. 161).

Traditional Greek names

The sample of traditional Greek names was created using the names from *Behind the Name* as a source. The longer names were sampled by going through the name list in alphabetical order and selecting for each letter of the alphabet the first name that had at least six letters. The set of shorter Greek names was sampled with the same method, taking the first shorter name. Authentic Greek names were preferred

to names that were transcribed, and ancient Greek names were preferred to the modern Greek names in those cases in which the name was given with variants. The sampled 40 names are shown in Appendix table 7 and the regional summary in Appendix table 8 (p. 232). The table shows that the Balkans has the highest appearance of the longer Greek names that have at least six letters, as expected. Bell Beaker Europe and Middle East have the second highest appearance figures. In the subgroup of 3–4 letter names, the geographic distribution is very different, as Bell Beaker Europe, Sundaland, Middle East, and Corded Ware Europe have a higher appearance figure than the Balkans. This result contradicts null hypothesis 2 according to *the long names and short names of a name set would have a similar geographic distribution*. The names of five letters reveal the same urheimat as the longer names. This means that the threshold between long names and short names can be set to five letters (or to five phones). Names with five letters (or phones) can be included to the research data, but they should be given less weight in the calculation of the Weighted Urheimat Indicator of the name set than the longer names.

Based on this the appearances of the traditional Greek names at different regions are illustrated in Figure 22 ignoring names with 2–4 letters. The integer number indicates the appearance of the at least six letters long names, and the decimal number shows the appearance of all names that had at least five letters. All regions of higher appearance are presented with a list of names, for which this region is the mode region for either first names or surnames. The calculated urheimat of this name set is Balkans & Crete based on the Weighted Urheimat Indicator (WUI). The WUI of Balkans & Crete was 8, which is the highest possible WUI (see p. 168). Weighted LCA seems to support this conclusion, as the appearance figures decline rather systematically when distancing away from the Balkans and Crete.

Inuit names

The Inuit names were obtained from schoolmykids.com by selecting all listed masculine first names. Appendix table 9 shows the detailed geographic distribution of the name set, and Appendix table 10 summarizes the total appearance of the selected 23 names and their variants in different geographic regions. The very wide geographic distribution of the 3–4 letter names across all regions suggests that names with less than five letters are easily invented independently in

parallel in several regions of the world. Due to this, the 3–4 letter names were ignored in the deduction of the urheimat of this name set. In addition, the decision was made not to include such short names to the deduction of urheimat even for the other name sets. The appearance of the long names was treated as the integer value of the appearance figure and the total appearance of the at least five letter long names was used as the decimal part (Figure 23 below). The colors show the frequency of the surname *Kallik* in different countries.

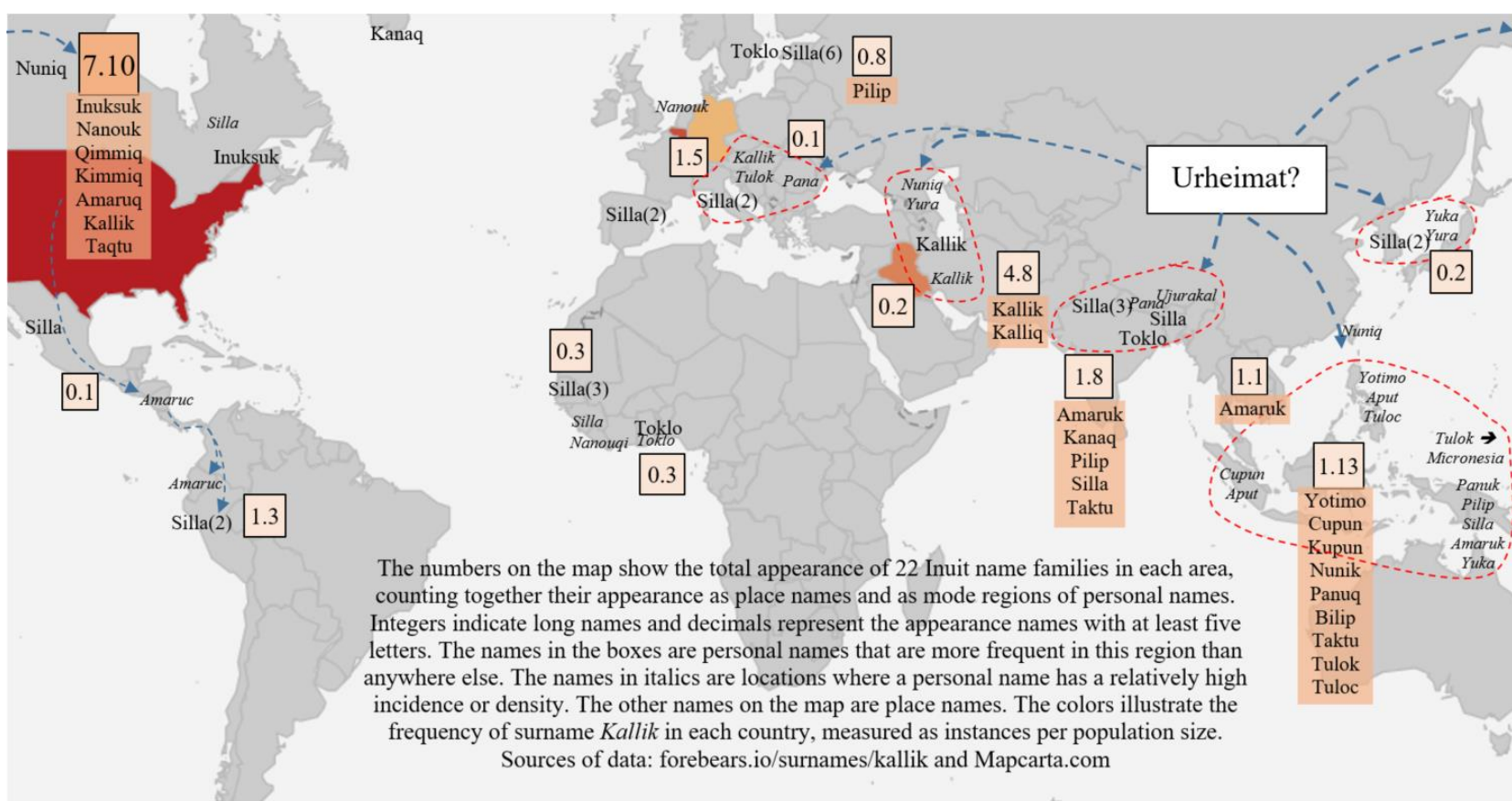


Figure 23: Geographic distribution of Inuit names in different regions

The calculated urheimat of this name set is Sundaland or North America with WUI = 3 for both of these regions (see p. 168). Based on Weighted LCA, the urheimat seems to be located somewhere in Eastern or Northern Asia from where the name set would have migrated to North America, Sundaland, and Gedrosia. This result matches with the genetic study of Kidd et al. (2022), according to which the origin of the North American natives is in Northern Asia. The geographic distribution of the Inuit names

does not match at all with the null hypothesis 3, according to which *long distance migrations were rare during ancient times and therefore the high appearance of the same name set at distant locations is the result of modern migrations or chance resemblance*. This is shown by the migrations from eastern Asia to North America: these migrations occurred long before the modern times.

5.5 Names from India and the Indian Ocean

Indo-Asiatic names

The Indo-Asiatic names were taken from the names of the states of India and from the ancient Indian names mentioned in the name list of Ahmed (2022). Place names have been marked only for places outside India because the high amount of place names in India would have made these place names impossible to read. The full list of the Indo-Asiatic name set is shown in Appendix table 15 and their

regional appearances are summarized in Appendix table 16. The distribution of the names is illustrated in Figure 24 below. The 4 letter name *Asia* was accepted to the sample as it has been used as a widely known geographical concept for thousands of years, and therefore, is unlikely to appear in Eurasia or Africa as an independently invented name that would have no etymological connection to the place name *Asia*. Some of the Indo-Asiatic names had a clear meaning in Sanskrit. These words include *Sagara* (“Night”) and *Andhakara* (“Darkness”).

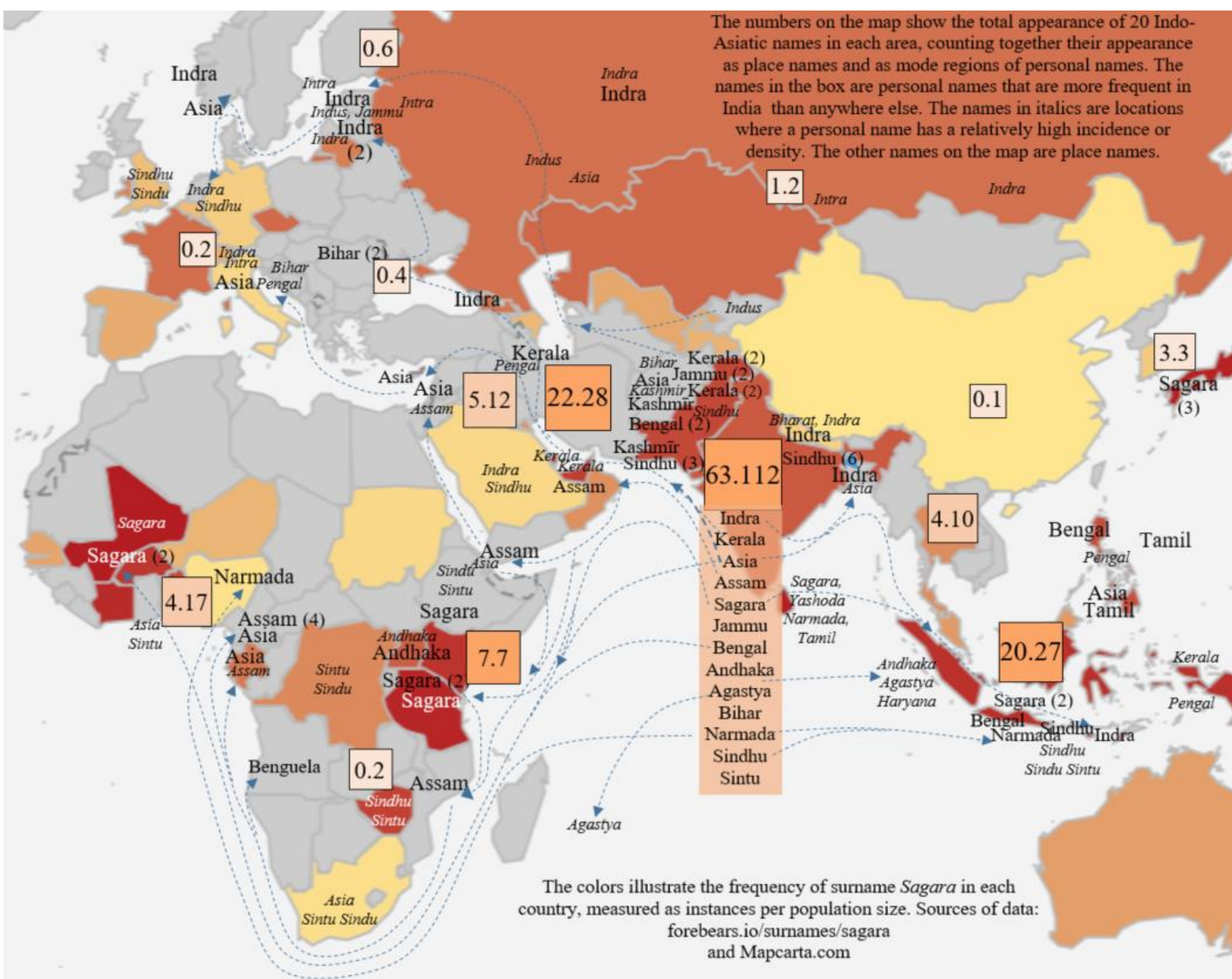


Figure 24: Geographic distribution of Indo-Asiatic names

The calculated urheimat of this name set is Extended India with WUI = 6 (see p. 168). Weighted LCA supports this conclusion, as India is the central location on the map in such a fashion that the appearance of the name set declines when travelling away from the India. The higher appearance of the surname *Sagara* in Wales than in England suggests that the Indo-Asiatic names would have travelled to Britain before modern times. The Indo-Asiatic names have a higher appearance in Corded Ware Europe than in Bell Beaker Europe or Kurgan Europe. This suggests that the Caspian Sea would have been the most effective connection from India to Scandinavia and to the Baltic Countries. The high appearance of the Indo-Asiatic names in Sundaland matches with Bellina (2023), according to whom there is robust evidence of the connection of India with SE Asia already 500–200 BCE.

Legendary Indian names

This name set covers the names mentioned by an Indian legend, which was documented by Megasthenes around 300 BCE and which was then saved for later generations in the writings of Arrian [*Indica*] and Diodorus Siculus [*Libr. Hist. II.38*]. This legend told how *Dionysus* arrived to the Indus Valley from northwest at the time when the big cities were constructed and how his son *Heracles Autochthonous*¹⁷⁰ became king of India. The legend mentions the later Indian kings *Spatembas*, *Bouduas*, and *Kraduas*, and the daughter of Heracles, princess *Pandaia*. After the listing of these names, a brief etymological study was made in order to find potential older variants and to reject the newer forms of the name. In addition, the name set was extended by dividing names to components. The results of these extensions of the name set are described below:

- **Dionysus** originates from *Dionys*, which appeared first in Greek texts in the form *Di-wo-nu-so*. The name seems to consist of two parts,

which would be *Diwo* and *Nuso*.¹⁷¹ Based on this etymology, the names *Dionys*, *Diwonuso*, *Diwo*, and *Nuso* were added to the name set, and *Dionysus* was removed, as it was considered a newer variant of *Dionys*.

- **Heracles** appears in Greek and Phoenician texts as *Heracles/Herakles* and in Etruscan texts as *Eracle*. The Roman variant *Hercules* was ignored, as it is younger than its Greek, Phoenician, and Etruscan namesakes. If *Heracles* is assumed a Greek name, it could possibly be formed from the name of the goddess *Hêra*, which has been combined with *klês* or *kleos*, giving the name the meaning “*The glory of Hera*”.¹⁷² Based on this the name was divided to the components *Hera* and *Kleos*, which were added to the name set. According to Cicero [*De Natura Deorum 3.16.42*], one of the early *Heracles* characters was *Heracles Belus*, which needs to be converted to *Heracles Baal*, as Cicero used the Latin variant of the name *Baal* in his text (*Belus*). The Phoenicians worshipped *Heracles* and assigned him the name *Baal*. Based on this, the name *Baal* was added to the name set.
- **Spatembas** was first mentioned by Megasthenes, and not much of the etymology of this name is known. In these prehistoric times, many names were short names, or combinations of two short names, like *Sakir-Har*. Based on this, *Spatembas* may have been originally *Spa-Tembas*. Therefore, the name *Tembas* was added to the name set. *Spa* was not added, as it was considered too short.
- **Bouduas** and **Kraduas** have an unknown etymology. Yet they both contain the component *duas*, which was added to the name set. Due to this, *Duas* was added to the name family.¹⁷³ As the components of *Bou-* and *Kra-*

¹⁷⁰ Autochthonous Indian (born in India)

¹⁷¹ Beekes (2009, p. 337).

¹⁷² Burkert (1985, p. 208–209)

¹⁷³ In Cebuano, *duas* which means “Bare”, “Uncovered”, “Naked” or a “Person who has a dirty white colour”. This

matches with the story of Megasthenes, according to which the tribe of *Bouduas* and *Kraduas* came from northwest, which means that they would have most likely had a white colour of skin than the local inhabitants of India.

were too small, they were not added to the name set.

For the other names, no reasons were found for dividing them to components, or for adding potential earlier versions of the original due to etymological hypotheses. After these adjustments, variants were generated based on these focal names, as described in chapter 5.2 (p. 162). The detailed geographic distribution of the resulting name set is shown in Appendix table 47 and the regional summary in Appendix table 48. The geographic distribution of the names is illustrated into Figure 25 below.

The calculated urheimat of this name set is Balkans and Crete with the WUI = 4 (see p. 168). This conclusion is not supported by Weighted LCA, which would locate the urheimat to the Middle East or to Gedrosia. Yet, it is possible to notice that the name set is divided to the more European names such as *Heracle** and *Dionys** and to the more Asiatic names such as *Pandaia*, *Bouduas*, *Graduas*, and *Spatembas*. The beginning of the name Spatembas (*Spa*) is carried as a first name by approximately 4500 Indians, but it was not included into the urheimat calculations due to its shortness.

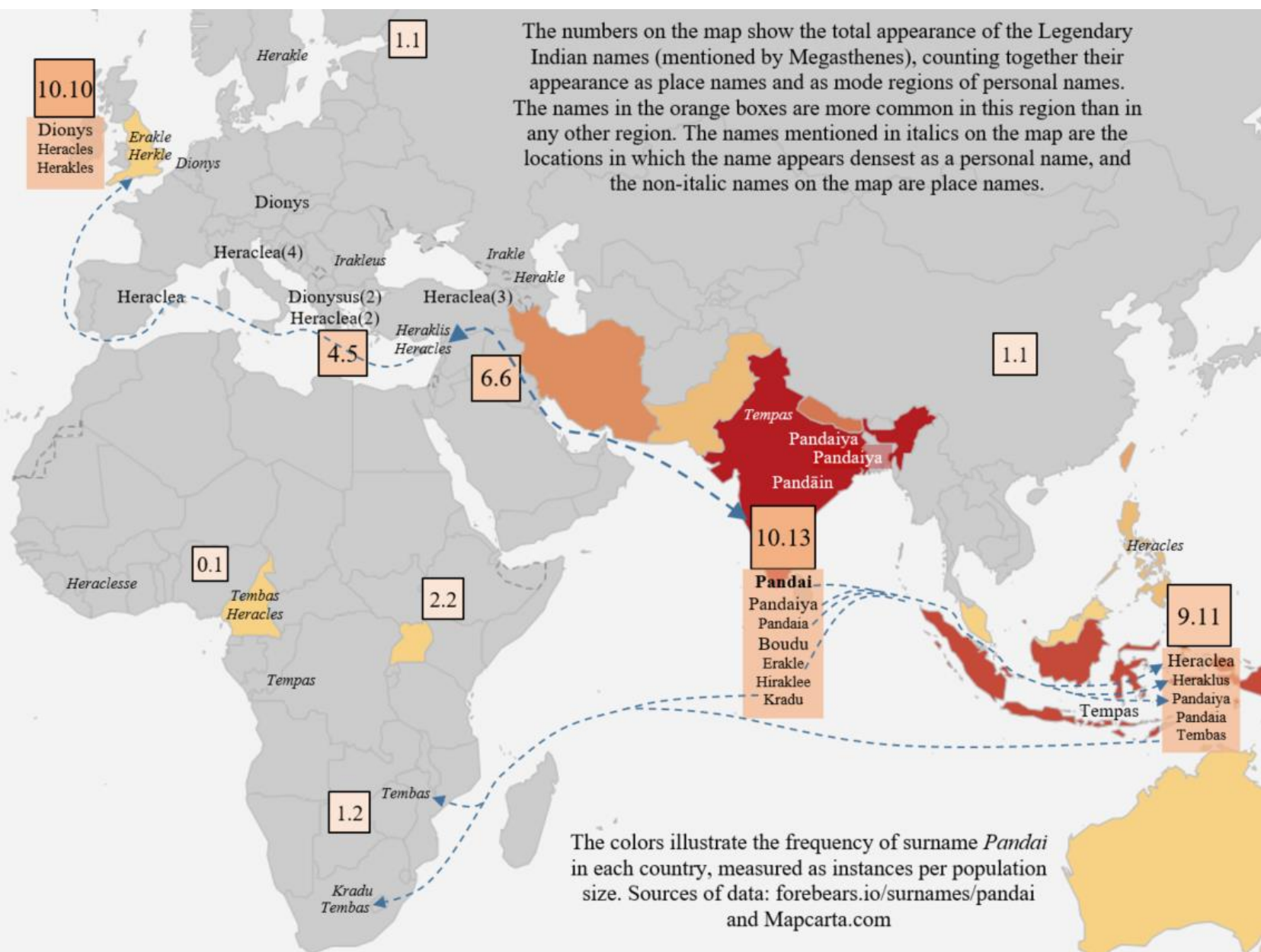


Figure 25: Geographic distribution of the Legendary Indian names mentioned by Megasthenes

Euhemerian names

This name set covers the names mentioned by Euhemerus in his travel story to the island of *Panachaia* / *Panachea*, which was located at the northern part of the Indian Ocean according to Euhemerus.¹⁷⁴ His travel story has been mostly considered as invented fiction, just like Plato's story of Atlantis. Yet, some have suggested that Euhemerus could have actually visited the island of Socotra or Bahrain. According to Euhemerus, *Uranus* and *Zeus* were among the first kings of *Panachaia* / *Panachea*. The story mentioned also the names of three ethnic groups (*Panachaeae*, *Oceanite*, and *Doia/Doian*), one toponym (*Hiera*), and three anthroponyms (*Triphylius*, *Panara*, and *Asterusia*). In order to proceed with the study of the mentioned names, a brief etymological study was made in order to find potential older variants and to reject the newer forms. In addition, the name set was extended by dividing names to components. The revealed at least five letter long components were added to the name set. The results of these extensions of the name set are described below:

- ***Zeus*** may originate from the Proto-Indo-European *dyēws, which means “sky”, “heaven”, or “sky god” ([Wiktionary](#)). In addition, it seems to be related the sky god *Dyaus* or *Dyaus-pita* of Rigveda ([Britannica 2021](#)). Based on this, the names *Dyews* and *Dyaus* were added to the name set.
- ***Uranus*** is usually presented as a Greek name, which was originally written as *Ouranos* or *Oranos* ([Wiktionary](#)). Based on this etymology, the names *Ouranos* and *Oranos* were added to the name set.
- ***Panachaeae*** is a name, which seems to originate from the components *Pan* and *Achaeae*, in which *Achaeae* is an adjective (“from Achaea”). Based on this, the name *Achaea* was added to the name set.

For the other names, no reasons were found for dividing them to components, or for adding potential earlier versions of the original due to etymological hypotheses. The detailed geographic distribution of the resulting name set is shown in Appendix table 49 and the regional summary in Appendix table 50. The geographic distribution of the names is illustrated into Figure 26 (p. 176). The calculated urheimat of this name set is Extended India with the WUI = 5 (see p. 168). This conclusion receives support from Weighted LCA, as the Appearances of this name set decline systematically when advancing away from India. Based on this, the potential migration paths in the figure are drawn outside from India towards other areas. The location of the urheimat to India suggests that Euhemerus actually visited the Indian Ocean in order to collect material for his story of *Panachaia* / *Panachea*. The geographic distribution of the names *Worsan*, *Uranus*, *Uranush*, *Doia*, *Doian*, and *Panchai* suggests that the island that Euhemerus visited would have been Socotra or Bahrain. The urheimat of the names *Uranus* and *Diaus* (*Zeus*) could possibly be in Sundaland based on the Archaeological deduction principle (see p. 63) as the diversity of these names is highest in Indonesia. An alternative interpretation is that the Euhemerian names were originally invented at the vicinity of Greece and were then imported to India by Alexander the Great. The names would then have diffused to Southern Asia during the years of Indian influence 300 BCE – 200 CE (see Bellina 2023). A second alternative explanation would be European colonialism. This explanation, however, does not explain the relatively large amount of the Euhemerian place names in Asia (29) and Eastern Africa (3), because colonialists would have been somewhat unlikely to give names like *Zeus*, *Uranu*, *Panach*, *Panara*, and *Achean* to the settlements in the lands that they conquered.

¹⁷⁴ Euhemerus [Sacred History]; referenced by Diodorus Siculus [Lib. Hist. 3.42.] and Lygdamus [Tib. 3.2.23].

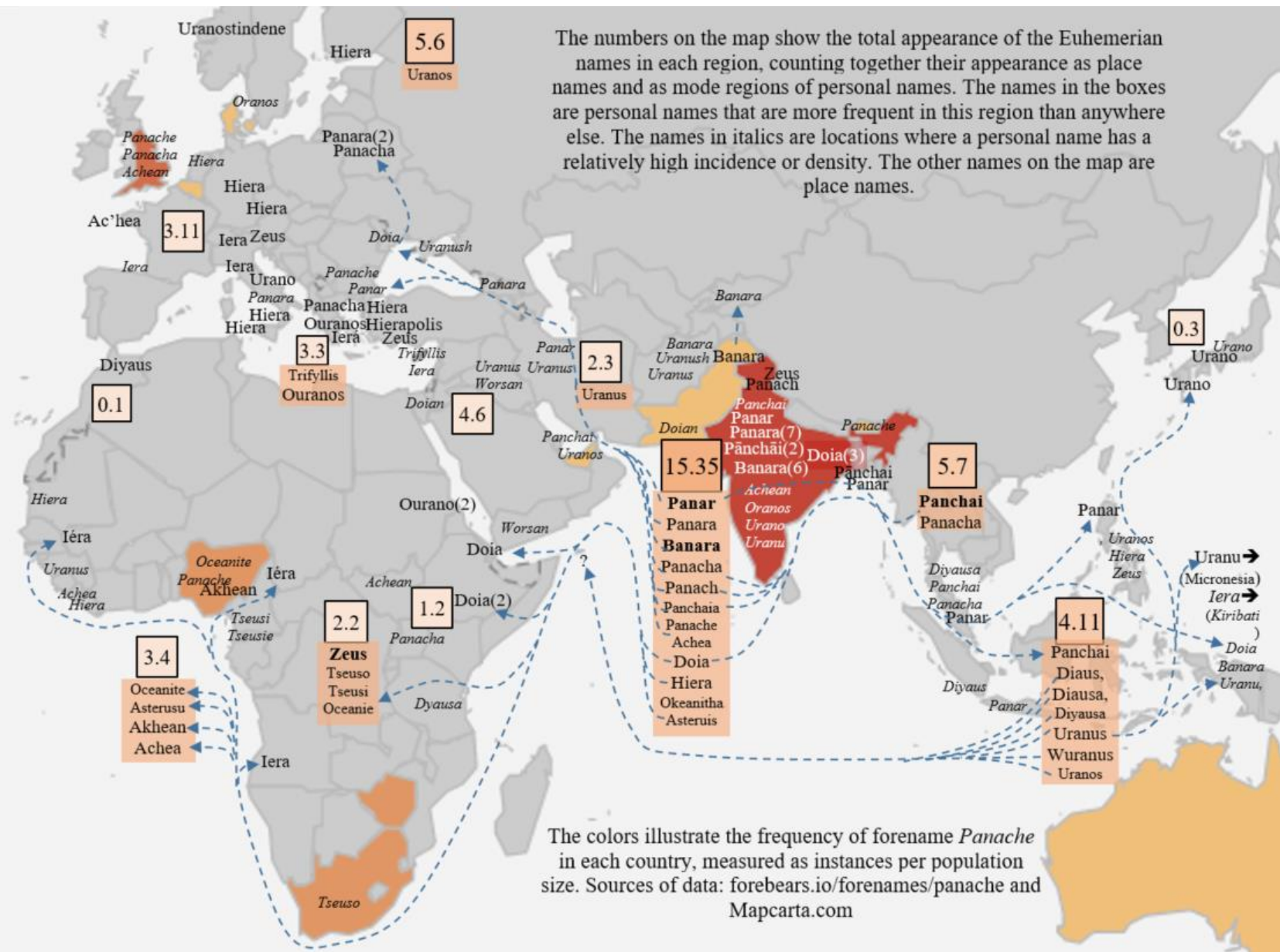


Figure 26: Geographic distribution of the Euhemerian names of the Island of Panchaia

5.6 Phoenician and Mitanni names

The name set of the Phoenician names was created by taking all of the Phoenician names mentioned at [Worldhistory.com](https://www.worldhistory.com) as a starting point, and then including to the name set the names of the earliest Phoenician cities *Tyre*, *Sidon*, and *Aradus*, which were mentioned by Strabo [Strab. 16.3.13]. The name set was then extended by including the Phoenician ancestral names mentioned in the *Phoenician History* [Praep. Evang. 1.10], except for the exceptionally famous Hellenistic names *Apollo*,

Atlas, *Heracles*, *Poseidon*, *Titan*, and *Uranus*. These names were not taken to the sample as they may have spread all around the world after the ancient times due to their international fame and heroic connotation. The detailed geographic distribution of the resulting name set is shown in Appendix table 11 and regional summary in Appendix table 12. Figure 27 (p. 178) illustrates the appearance of the Phoenician names at different geographic regions. The calculated urheimat of this name set is Extended India with WUI = 5 (see p.

168). Herodotus [Hdt. Hist. 1.1] supports this conclusion by telling that the Phoenicians originated from the northern coasts of the Indian Ocean before they sailed to Europe. Weighted LCA, however, seems to support the location of the urheimat to Pakistan, which is connected to the Caspian Sea – Volga route via Amu Darya. This interpretation receives support from the geographic distribution of the names, if names without vowels are included to the name set (*Shmnh*, *Strt*, *Blh*, *Hrm*, *Kbr*, etc.) An alternative explanation of the wide appearance of the Phoenician names in the Indian Subcontinent and Sundaland is that the names were born in the

Middle East and then they became popular in Western Europe by 1500 CE. After this, the names would have migrated to India and Sundaland along with European colonialists. This explanation, however, does not explain why the Phoenician names appear widely also as place names in India and Sundaland. The Phoenician names in West Africa might have migrated there from India, Pakistan, or Bahrain, but an alternative explanation could be the expedition of Hanno the Navigator during the seventh century BCE (see p. 100) or Spanish and Portuguese colonialism later on.

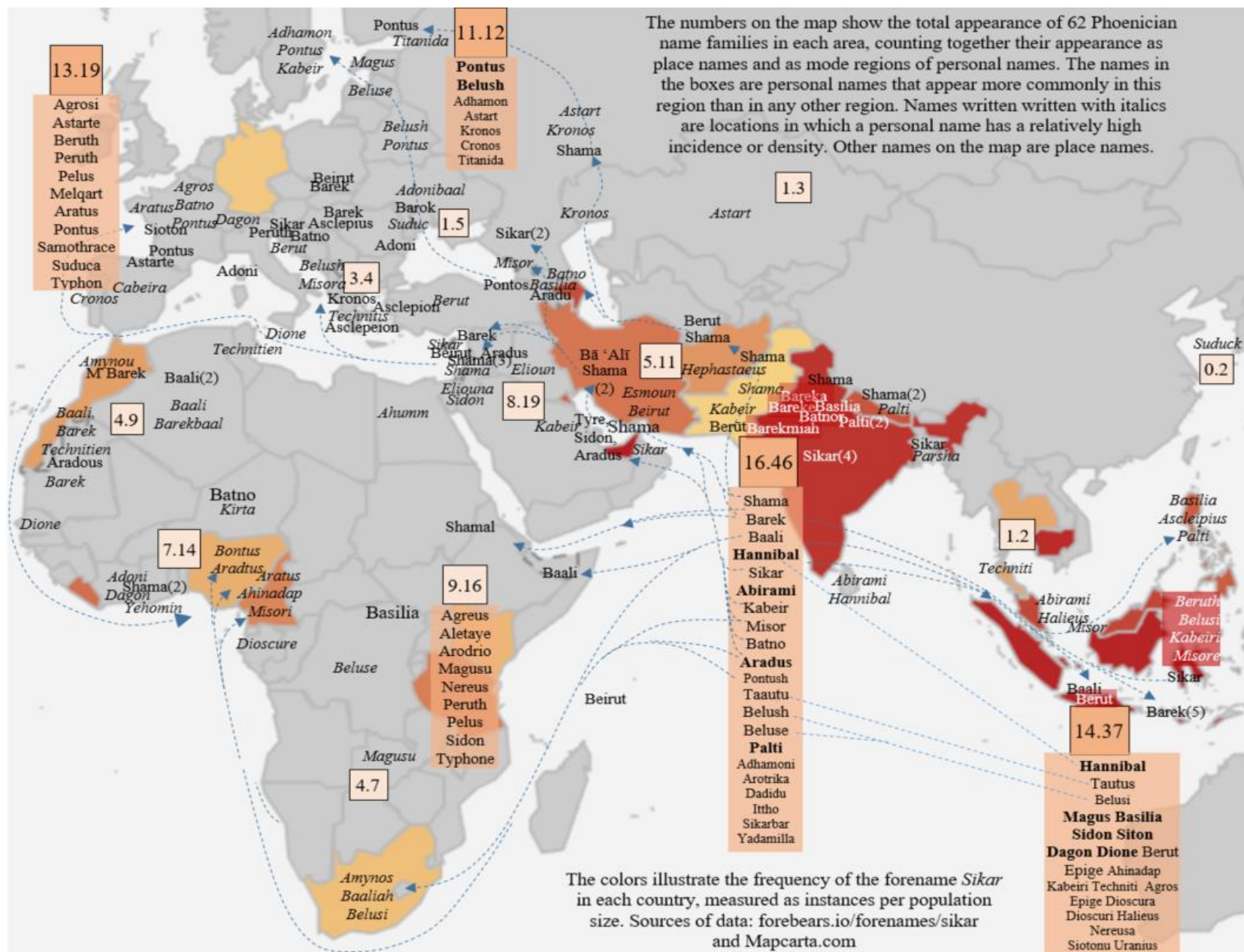


Figure 27: Geographic distribution of Phoenician names

Mitanni names

The original name set of the Mitanni kings was obtained from [Wikipedia](#). This name set was then extended by those variants of the names, which are mentioned as Mitanni kings in ancient Indian sources. The detailed geographic distribution of the Mitanni names is presented in Appendix table 13, and the regional summary is shown in Appendix

table 14. Figure 28 below illustrates the geographic distribution of the Mitanni name families. The calculated urheimat of this name is Extended India with WUI = 6 (see p. 168). Weighted LCA provides support for this conclusion, and the appearances decline systematically when advancing away from India. The name *Kirta/Girta* and *Vasa/Wasa* can be used for drawing a tentative migration path from India to West Africa.

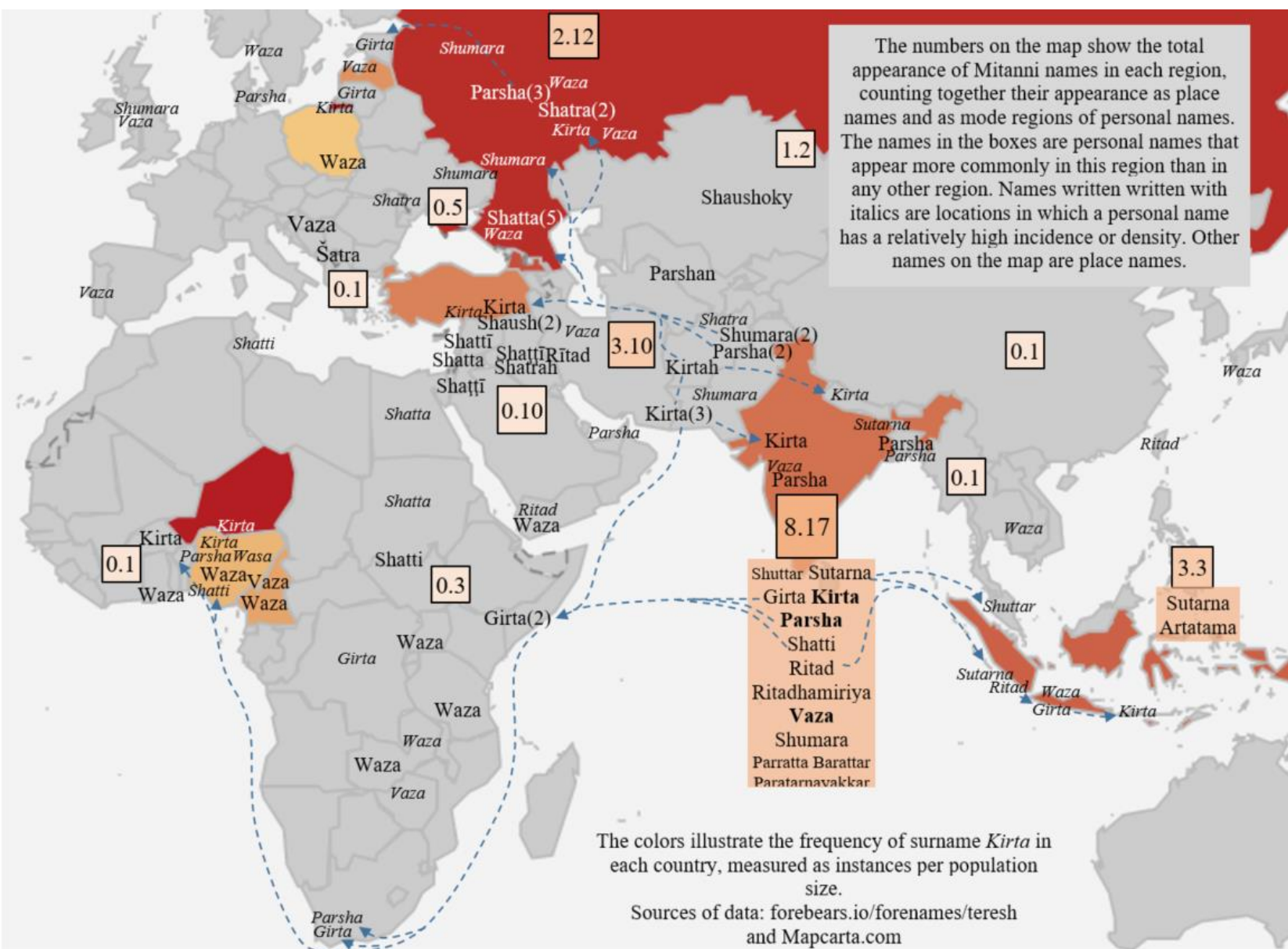


Figure 28: Geographic distribution of the names of the Mitanni kings

5.7 *Ethiopian, Hyksos and Kushite names*

Ethiopian names

The Ethiopian name set is based on Ahmed (2021, [Ethiopian](#)), which lists 77 traditional Ethiopian names. Only forenames with at least five letters were searched for and only exact matches were accepted. In addition, globally widespread Jewish and Arabic names like *Daniel*, *Abraham*, *Aaron*, *Jonathan*, and *Ahmed* were rejected, as well as those

names that were classified as Arabic by the Namespedia.com. The geographic distribution of the names is shown in Appendix table 17, and their geographic appearance is illustrated in Figure 58. The calculated urheimat of the name set is Extended India with WUI = 4 (see p. 168). The Weighted LCA, however, seems to suggest an urheimat in Eastern Africa. Based on this, some of the names like *Shango* seem to have migrated to India from East Africa, whereas others like *Amara/Amari* would have originated from India.

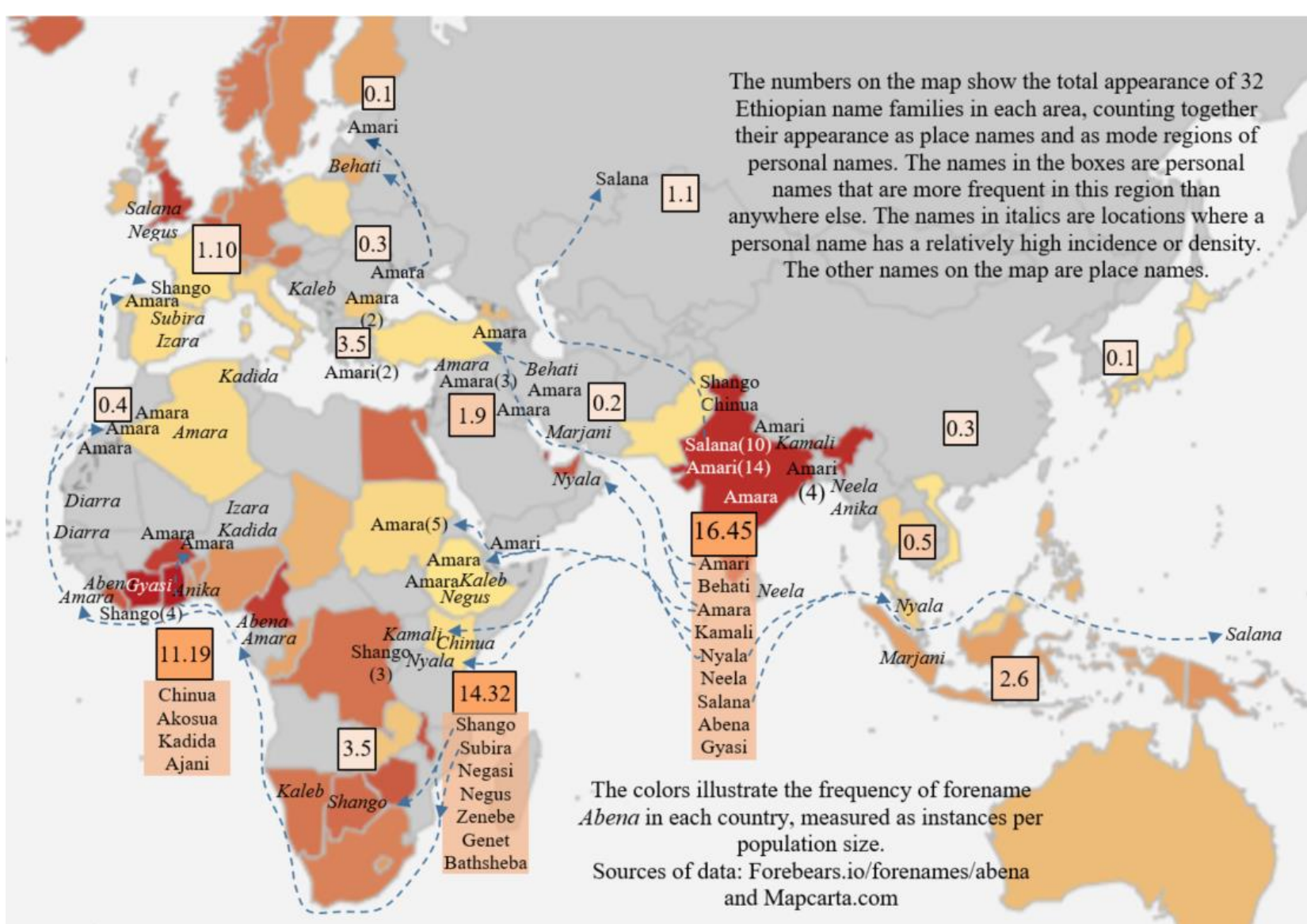


Figure 29: Geographic distribution of traditional Ethiopian names

Hyksos names

The *Hyksos* conquered Egypt approximately 1638 BCE (Stantis et al. 2015). According to the Indian Hyksos hypothesis, *the Hyksos conquerors of Lower Egypt (1638 BCE) were Indian, Middle Eastern or East African successors of the Harappans, or they were an alliance of these groups* (see p. 148). The list of the Hyksos names was obtained from [Wikipedia](#). They include *Abisha*, *Apepi*, *Apophis*, *Chayan*, *Chayran*, *Khamudi*, *Sakir-Har*, and *Yanassi*. As the land of *Sekmem* is mentioned as a potential part of the

country of the Hyksos, this name was added to the name set. Although the name *Har* is a very short one, its significance as a migration marker is increased because it appears right next to the name *Sakir* in Yemen, Pakistan, and Indonesia. This suggests that the names would be culturally and historically connected, forming the name of king *Sakir-Har* of the Hyksos. The geographic distribution of the Hyksos names is presented in Appendix table 19 and their regional appearances in Appendix table 20. Figure 30 below shows that the Hyksos names have their highest appearance in Extended India.

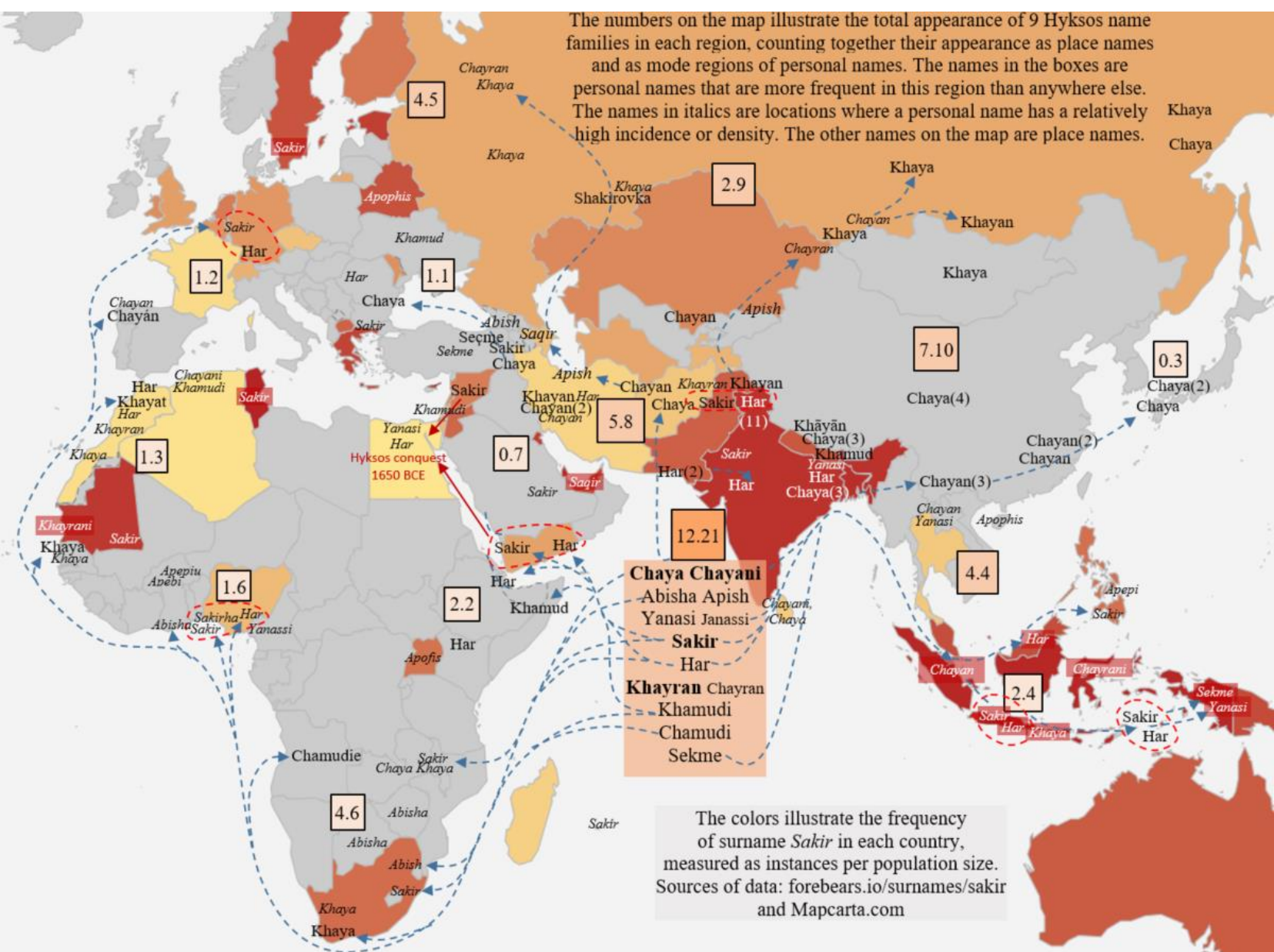


Figure 30: Geographic distribution of Hyksos names

The calculated urheimat of this name set is Extended India with WUI = 7 (see p. 168). Weighted LCA seems to support this conclusion and the appearances of the Hyksos names decline systematically when advancing away from India. The heavy concentration of the Hyksos names to India and the appearance of the names *Sakir* and *Har* in the Indus Valley, Yemen, and Nigeria supports the Indian Hyksos hypothesis. In addition, it provides support for the India → West Africa hypothesis.

Kushite names

Names of 8 Kushite kings and 17 royal spouses were obtained from [Wikipedia](#). In addition to these names, the names *Kush* and *Kerma* were included in this name set based on their historical existence as Kushite locations. The geographic distribution of these names is shown in Appendix table 21, and regional summary in Appendix table 22. Figure 31 below illustrates the geographic appearance of the Kushite names.

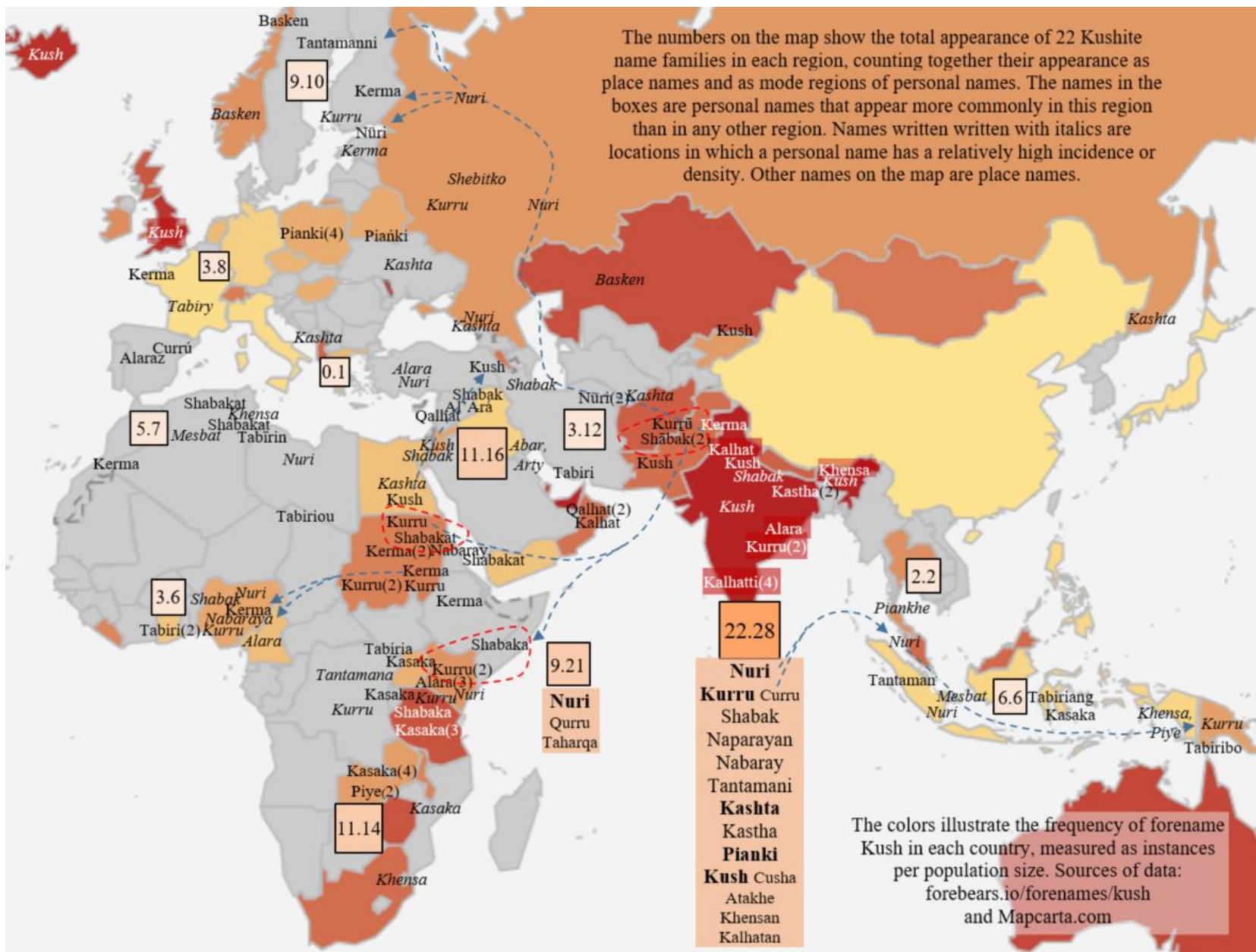


Figure 31: Geographic distribution of Kushite names

The calculated urheimat of this name set is Extended India with WUI = 6 (see p. 168). Weighted LCA seems to provide only weak support for this conclusion. The somewhat low appearance of the Kushite names in East Africa could be partly caused by strong Arabic and Islamic influence, which would have replaced the main part of the ancient Kushite names with Arabic or Islamic names. This interpretation is supported by East Africa having a high incidence of Kushite place names and a low incidence of Kushite anthroponyms. (Religions and fashions may easily change anthroponyms but not so easily place names). India, on the other hand, has slightly lower frequency of Kushite names as place names, but a relatively high incidence of these names as anthroponyms.

5.8 West African names and Legendary African names

Archaeological West African names

The name set of the Archaeological West African names place names that appear on the map of archaeological sites at the valley of Niger River in Nigeria (Monroe 2019). This map contained 33 potentially prehistoric place names. The list of these names, together with their geographical distributions is given in Appendix table 23 and the regional summary of their appearances is given in Appendix table 24. Figure 32 shows the geographic distribution of the names.

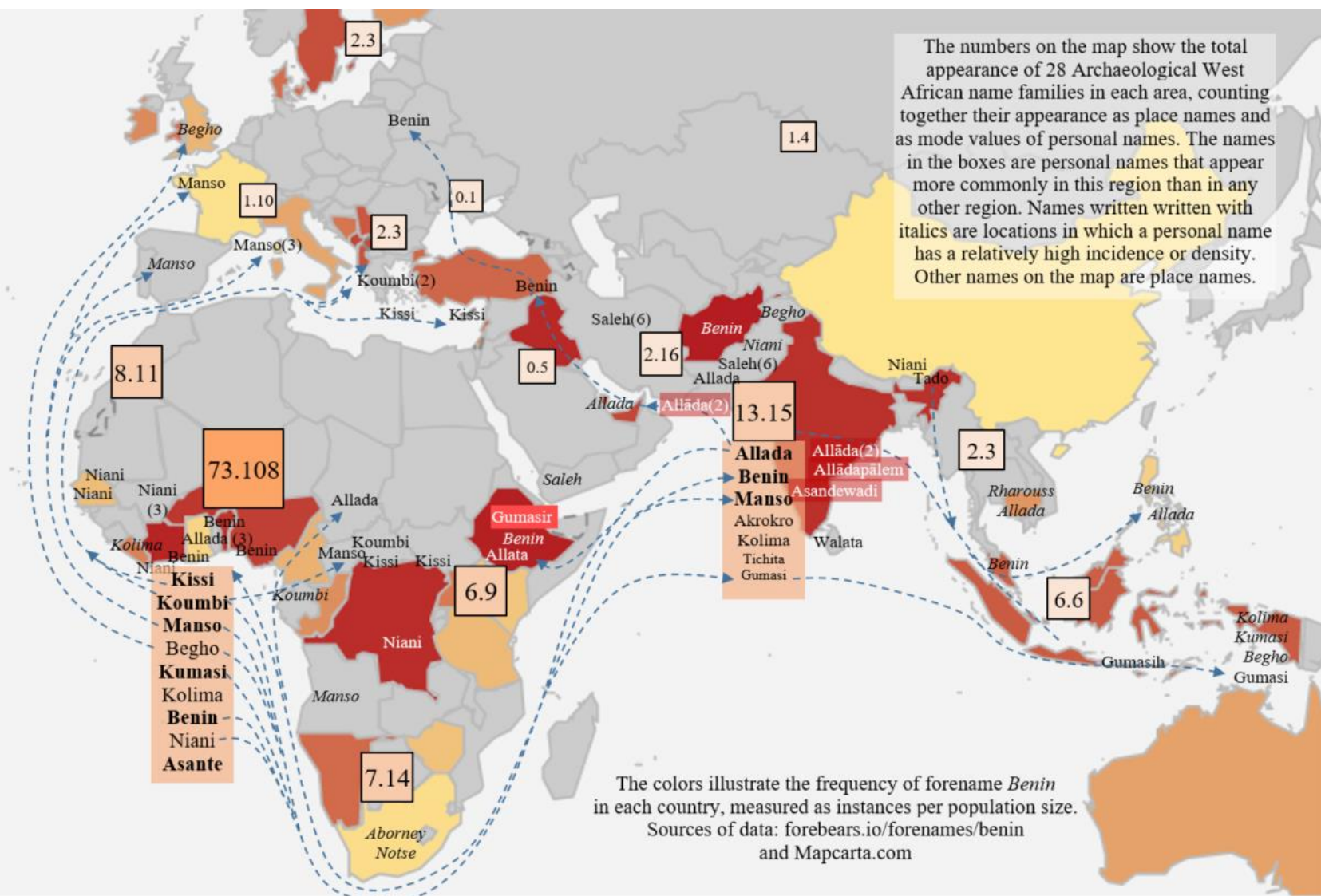


Figure 32: Geographic distribution of Archaeological West African names

The calculated urheimat of this name set is West Africa with WUI = 8 (see p. 168). Weighted LCA seems to support this conclusion. However, some names like *Allada* are more common in India than in West Africa. In addition, the names *Benin*, *Begho*, *Niani*, and *Manso* are equally common in India and in West Africa. This suggests migrations between West Africa and India, although the name *Manso* could also be of Portuguese origin. The name *Benin* is more common as an anthroponym in Ireland and Wales than in England. This suggests that this name would have arrived from India or Africa to Ireland and Wales before modern times.

Fulani names

The sample was made from the Fulani names of Behind the Name by taking no more than five names from each letter of the alphabet, accepting only names with at least six letters. Names that were classified as Arabic by the Namespedia.com were rejected, as they indicated migrations that are more recent. As the name set was already very big, no variants were generated. The detailed geographic distribution of the Fulani names as place names and anthroponyms is shown in Appendix table 25, and the summary is in Appendix table 26. The data is presented in visual format in the Figure 33.

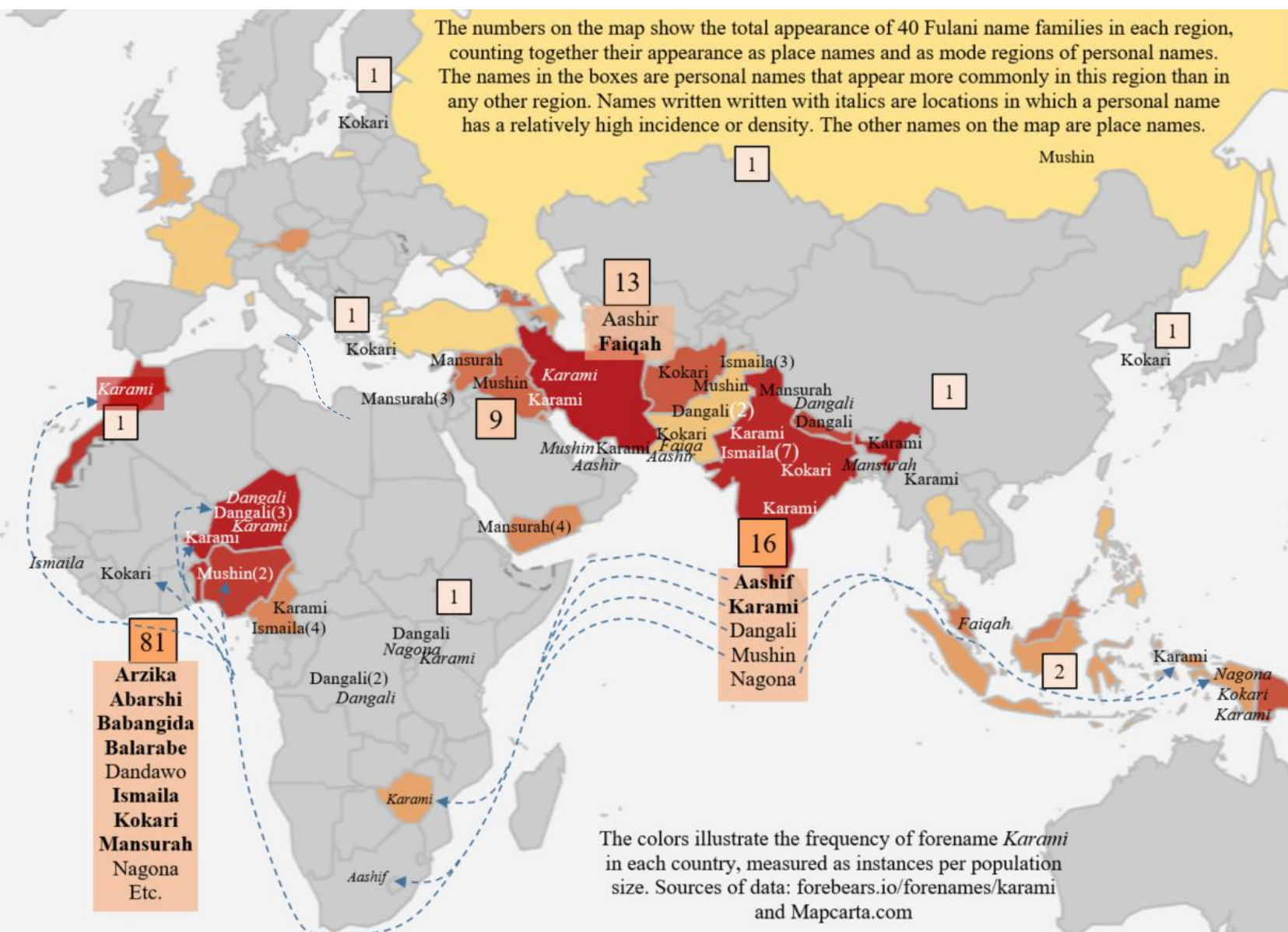


Figure 33: Geographic distribution of Fulani names

The urheimat of this name set is West Africa with WUI = 8 (see p. 168). Weighted LCA supports this urheimat, as West Africa has the higher appearance figure than all other regions combined. Yet, some names of this name set, like *Aashif*, *Karami*, *Dangali*, *Mushin*, and *Nagona* are more common in India than in West Africa, and they appear also in Papua New Guinea. This suggests that the urheimat of these names would be in India, from where they migrated to West Africa and Papua New Guinea.

Ancient West African names

The Ancient West African names were obtained from the descriptions of the “countries on the other side of Africa”, reported by Pliny the Elder [*Nat. Hist. V.8*]. In addition, the name set was extended with all the at least five letter long place names that were mentioned in the map of al Idrisi, close to location 17° 13°, and along the river that flowed from there towards the Atlantic Ocean (see p. 248). These names would be ancient names from the Lake Chad region. The resulting name set is shown in Appendix table 27 and the regional appearances are illustrated in Figure 34 below.

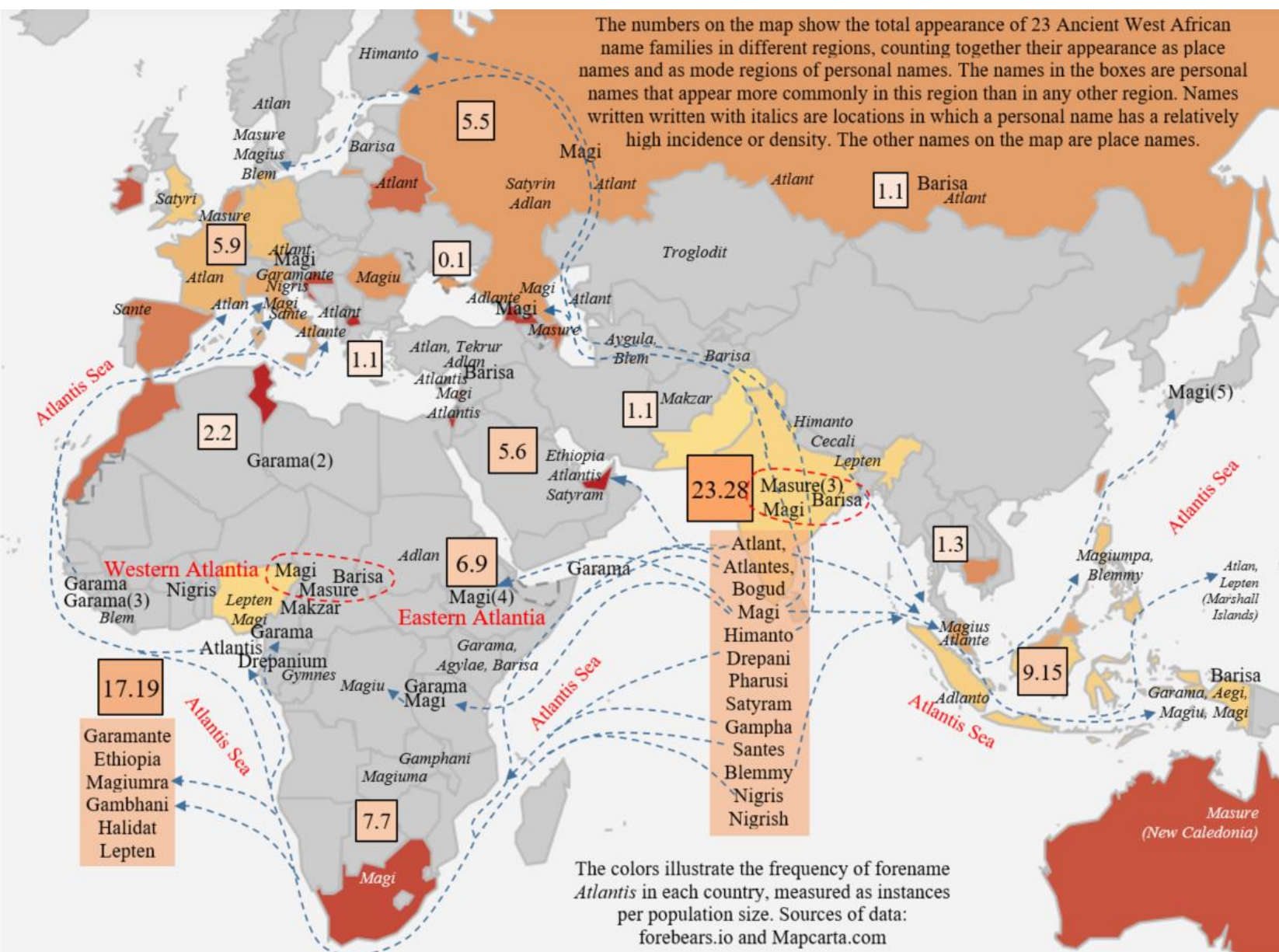


Figure 34: Geographic distribution of Ancient West African names

The *Atlantis Sea* on the map is the sea, which connected the Erythraean Sea to Iberia according to Herodotus [Hdt. 1.203.1]. The island of *Atlantis* on the map is the island that existed close to Cerne, at the same meridian as Carthage [Plin. Nat. Hist. II.36.106]. Based on the context of Pliny's description, this island appeared to be somewhat insignificant and unrelated to Plato's Atlantis. The calculated urheimat of this name set is Extended India with WUI = 5 (see p. 168). Weighted LCA seems to give some tentative support to this conclusion, although the appearances of the name do not systematically decline when distancing from India. This increased the Total Reliability of the urheimat conclusion to 6. Although it is possible that identical short names are independently

invented at different regions of the world, it is unlikely that the place names *Magi*, *Barisa*, and *Masure* would have been randomly invented as place names close to each other both in Chad and in India.

Legendary African names

The name set of Legendary African names was collected from the myths presented in Encyclopedia.com and Mythencyclopedia.com. The full name set is shown in Appendix table 29, and the regional summary in Appendix table 30. The geographic distribution of the names is shown in Figure 35 below.

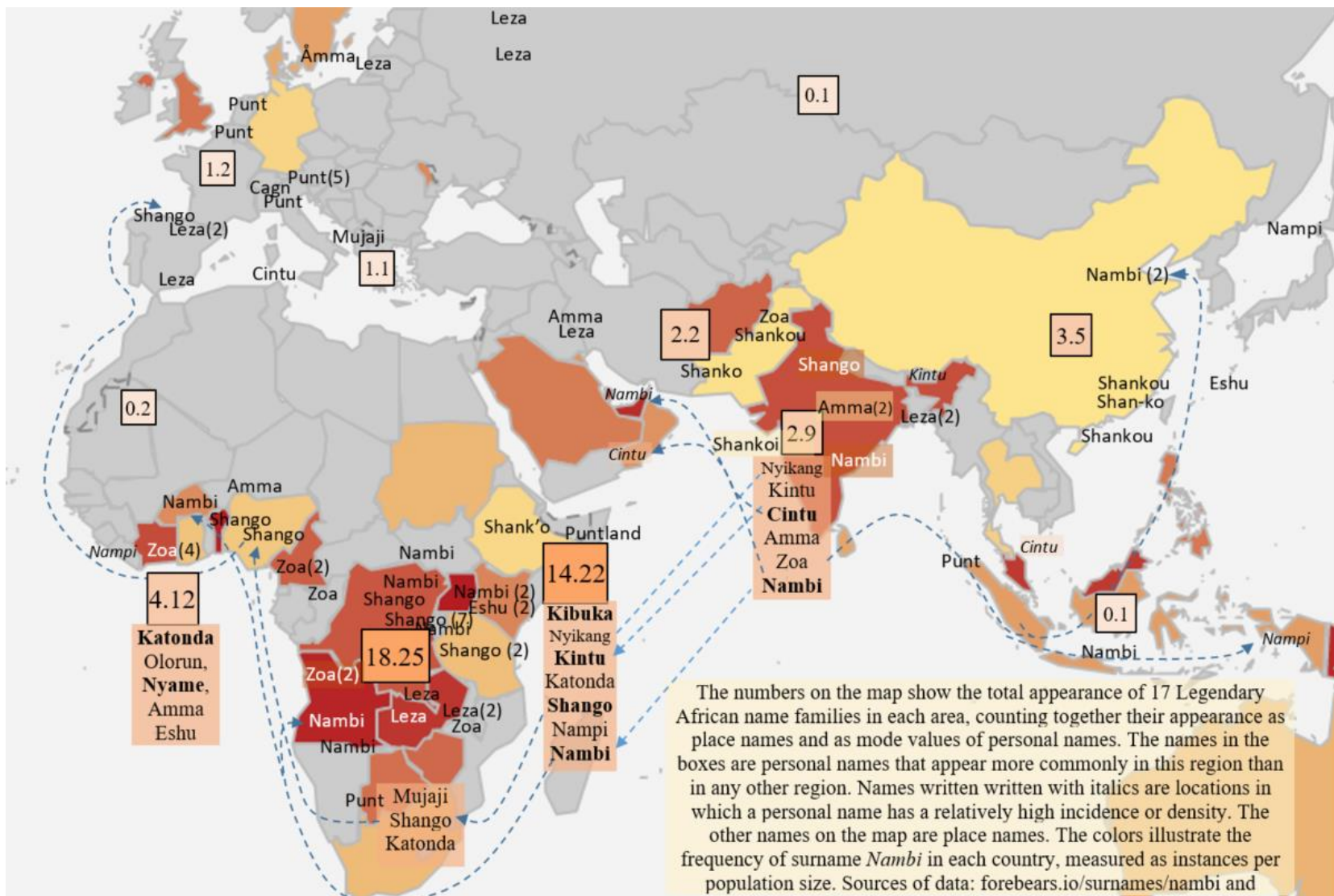


Figure 35: Geographic distribution of Legendary African names

The calculated urheimat of this name set is Central and South Africa with WUI = 6 (see p. 168). Weighted LCA supports this conclusion. Yet, according to an African legend, *Kintu* and *Nambi* came to East Africa from somewhere far away. Based on the distribution of these names, it seems that they would have come from India.

5.9 Sea People, Berber, and Libu names

The name set of the Sea Peoples was constructed based on the names listed in the Kadesh inscriptions

(1210 BCE), Great Karnak inscription and the Athribis Stele (1200 BCE), on the Medinet Habu and Papyrus Harris I (1150 BCE), and on the Hittite texts that referred to the Sea Peoples as *Ahhiyawa* during the reign of Suppiluliumas (Encyclopedia Britannica 2022-05-21). The detailed geographic distribution of these names is shown in Appendix table 31, and the regional summary in Appendix table 32. The results are illustrated into Figure 36 below.

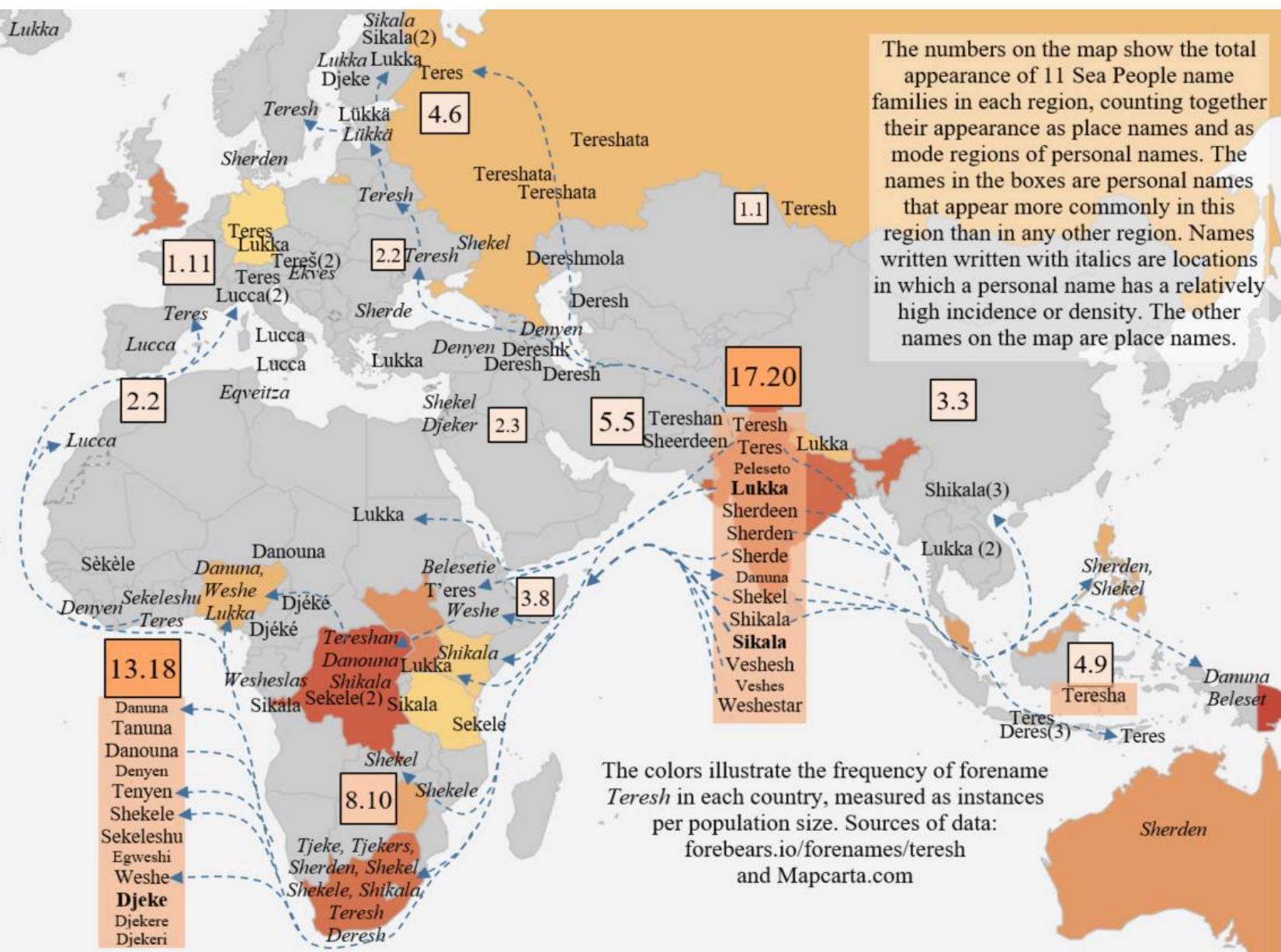


Figure 36: Geographic distribution of Sea Peoples names

The urheimat of this name set is India with WUI = 6 (see p. 168). Weighted LCA seems to provide some support for this conclusion, as India and its neighboring regions together would have the Appearance of 31.35 whereas Africa and Western Europe together have only 23.47.

Berber and Libu names

The Berber names were taken from Behind the Name, accepting only names with at least six letters. This original name set was then extended by those names of the ancient *Libu* people, which had at least

five letters and who were mentioned in [Wikipedia](#) as Egyptian rulers or as members of their family. This extension was because the Libu were probably ancestors of the Berbers. In those cases that the Libu name was a combination name like *Nes-Djehuti*, only those name parts that had a least five letters were accepted. In addition to these names, also the name *Atala* was included to the name set, as according to a Berber tradition, the Berber tribe originates from *Atala* (Joseph 2005, 32). The full list of the Berber and Libu names is shown in Appendix table 33. Figure 37 shows the geographic distribution the names, based on Appendix table 34.

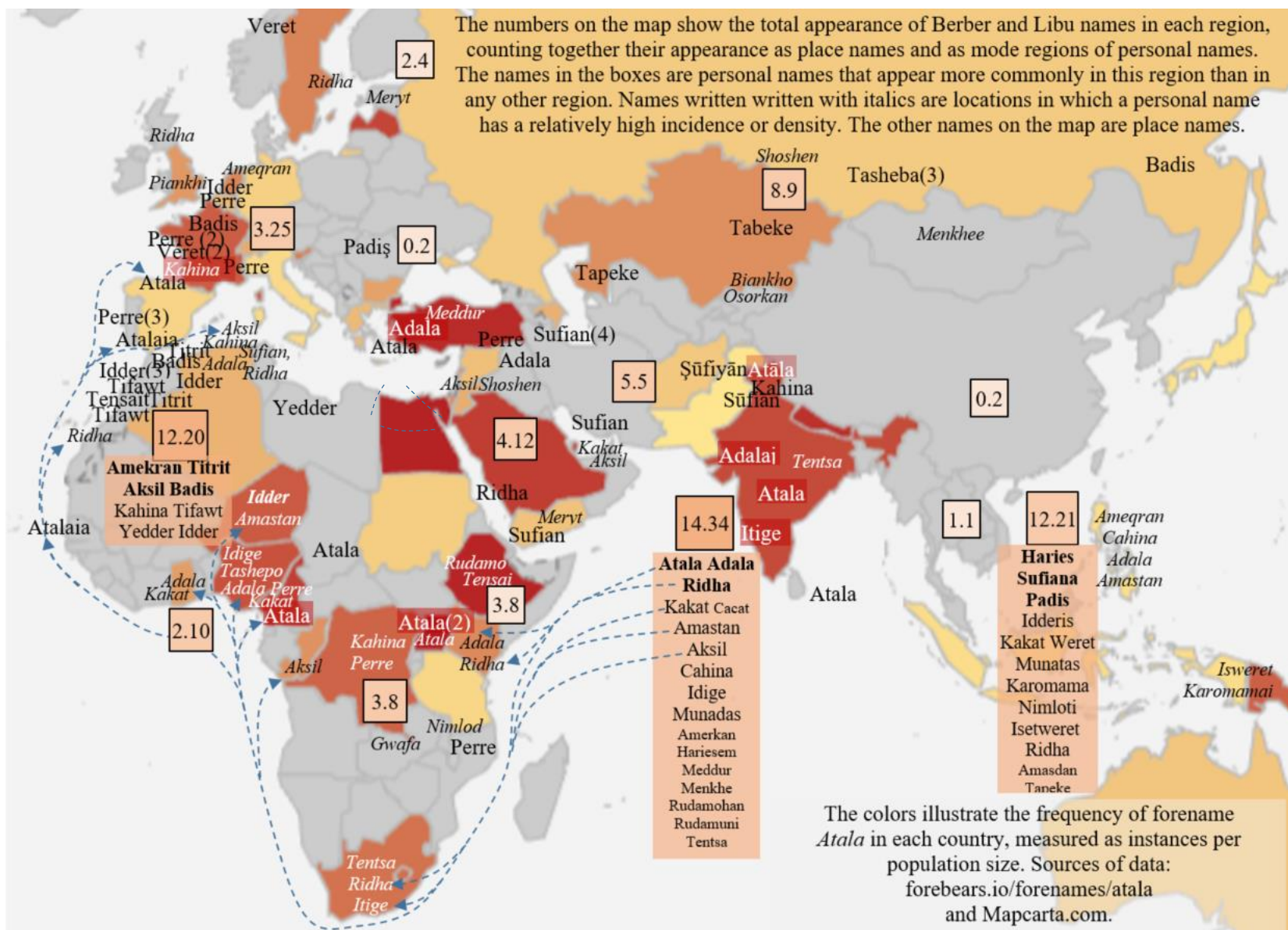


Figure 37: Geographic distribution of Berber and Libu names

The calculated urheimat of the Berber and Libu name set is Extended India with WUI = 5.5 (see p. 168). Weighted LCA supports this conclusion, as there are high appearances of these names north and east of India. The name family *Atala/Adala/Atalaia* seems to have migrated from India to Iberia via Africa, and the names and the names *Aksil*, *Kahina*, and *Ridha* seem to have migrated to Maghreb from India. Although *Atala/Adala* appears also at the Mediterranean region as a place name, it is more likely that the *Atalaia* in Portugal and *Atala* in the Basque country would have originated from Afro-Indian sources than from the Near East.

5.10 Names of Iberia and Etruria

Iberian names

The Iberian name set was based on the names that were listed at name-archive.fandom.com as ancient Iberian names. In addition to them, the names *Iberia* and *Iberian* were included into the name set. The detailed geographic distribution of the Iberian names is shown in Appendix table 35, and the regional summaries in Appendix table 36. The appearance of the names at different areas is illustrated in Figure 38 below.

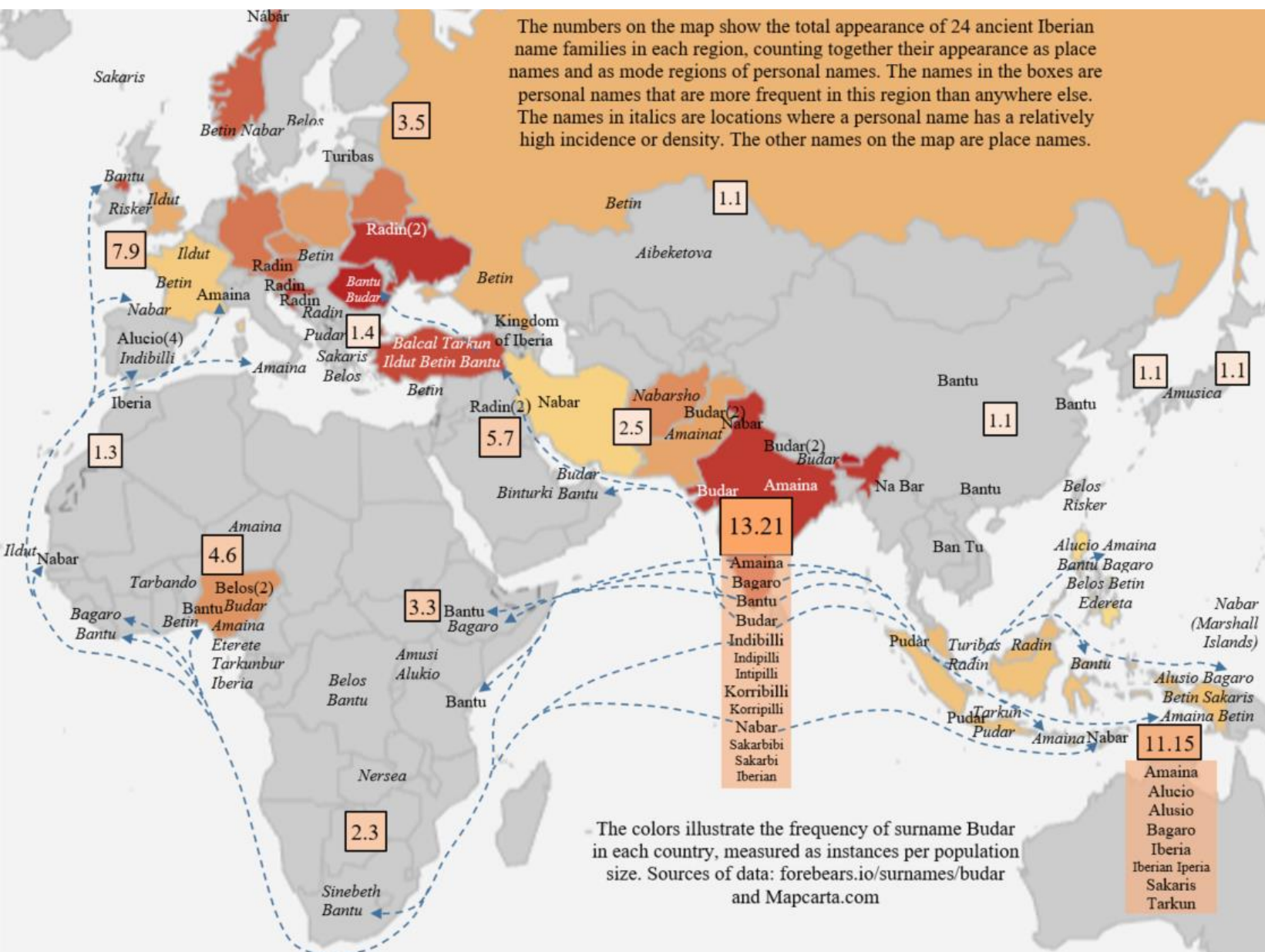


Figure 38: Geographic distribution of Ancient Iberian names

Based on the geographic distribution of the names, the urheimat of this name set is Extended India with WUI = 5.5 (see p. 168). Weighted LCA supports this conclusion, as Sundaland is the region of second highest appearance. The name *Nabar*, which is most common as an anthroponym in India, appears as a place name in Senegal and as an anthroponym in the Basque country. This matches with the migration of the Dravidian vocabulary to Senegal (Wolof) and to the Basque country (Basque). An alternative explanation is that the Iberian names originated from Iberia, from where they spread to Sundaland during

Spanish and Portuguese colonialism. This explanation, however, does not explain why India, Pakistan, and Nepal have such a high appearance of ancient Iberian names.

Indigetean names

The geographic distribution of the Indigetean name set is shown in Appendix table 37 and regional summary in Appendix table 38. The illustration of the geographic distribution and potential migration paths is shown in Figure 39 below.

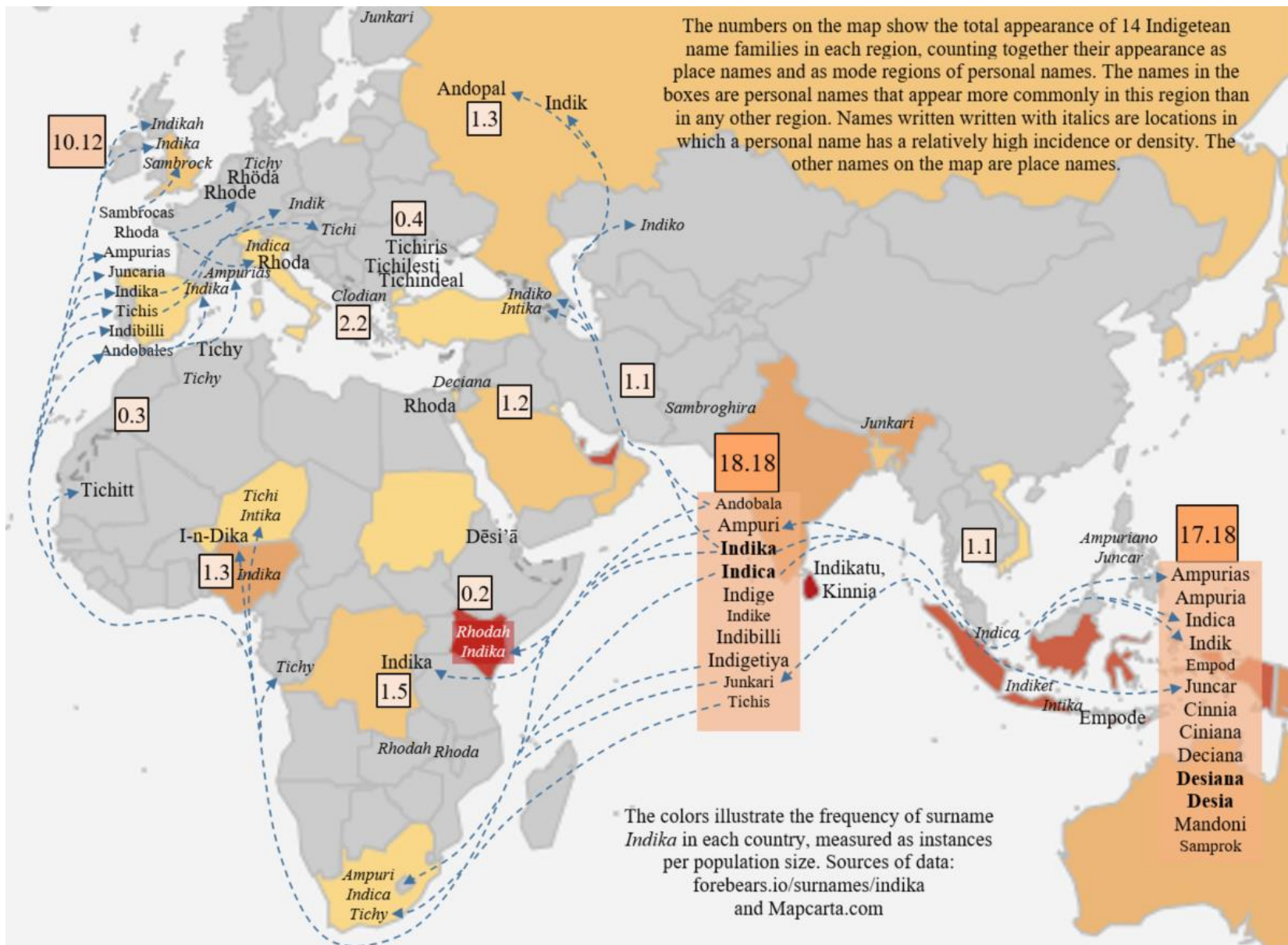


Figure 39: Geographic distribution of Indigetean names

The name set was constructed based on the historical sources that refer to the tribe of *Indigetes* or *Indiketes* that lived in northern Iberia [Strab. 3.4.1, 3.4.8 and Ptol. 2.6.19]. The name set is likely to be biased, as the sources do not make a clear distinction between the cities and rivers of the Indigetes and their neighbors. Despite this risk, this name set was formed around the names *Indigetes*, *Indigetae*, *Indika*, *Ampurias*, *Empodrae*, *Rhoda*, *Juncaria*, *Cinniana*, *Deciana*, *Clodianus*, *Sambrocas*, and *Tichis*, which were mentioned in [Wikipedia](#) as names that related to the Indigeteans. The names of the Iberian chieftains *Indibilis*, *Andobales*, and *Mandonius* were added to this name set as they refer to Iberian chieftains that were fighting against the Romans in Iberia.

The calculated urheimat of the Indigetean name set is Extended India or Sundaland with WUI = 3 (see p. 168). According to Weighted LCA, the likely urheimat is Extended India. This is supported by the etymological connection of the *Indi** names with India. Although it might be possible to explain the high appearance of the Indigetean names in Sundaland by Spanish colonialism, this interpretation does not explain the appearance of the place name *Indika* in Democratic Republic of Congo, *I-n-Dika* in Niger, and *Indik* in Russia.

Legendary Catalan names

According to the [legend of Tubal](#), the first ancestors of the Spanish kings settled to Iberia around 2157 BCE. This legend is supported by the story of the Umayyad conquest of Hispania, which mentions *Tubal* in the form of *Sem Tofail*, and his

sons as *Tarraho*, *Sem Tofail Younger*, and *Iber*.¹⁷⁵

The core of the legend was that *Tubal*, son of *Japteth*, sailed to Iberia, founded several cities, and then divided the land among his sons. Different versions of the story named different cities and different sons. The name set of the legendary Catalan names includes the name of *Japteth*, his sons, and all other anthroponyms and place names mentioned in the different versions of the legend. The place name data, which was obtained from Mapcarta.com, was extended by locating Iberia also to Caucasus, based on historical sources.¹⁷⁶ The name set is shown in Appendix table 41, and the regional summary in Appendix table 42. The data is illustrated in Figure 40 (p. 191).

The urheimat of this name set is Bell Beaker Europe with WUI = 4 (see p. 168). However, based on Weighted LCA, Extended India is a more likely urheimat. Based on this, the tentative migration arrows have been drawn from the Indian Ocean around Africa towards Iberia. An alternative interpretation is that the Legendary Catalan names have originated from Europe, and moved to Sundaland along with the Spanish colonialists. This, however, does not explain the relatively high density of the Legendary Catalan names in the Pakistan–Afghanistan region, which has sent genes to the coasts of the North Sea 600–400 BCE, based on the GAHAH data. The anthroponym *Basque* may also be worth of additional investigations, as it is densest in Afghanistan, and especially at the region where the Kalash people live.

¹⁷⁵ Abulcasim Tarif Abentarique (750 CE) Espagne. [French translation](#) by Mibuel de Luna et al. 1708, pages 411–417.

¹⁷⁶ Gabilondo (2016, 78)

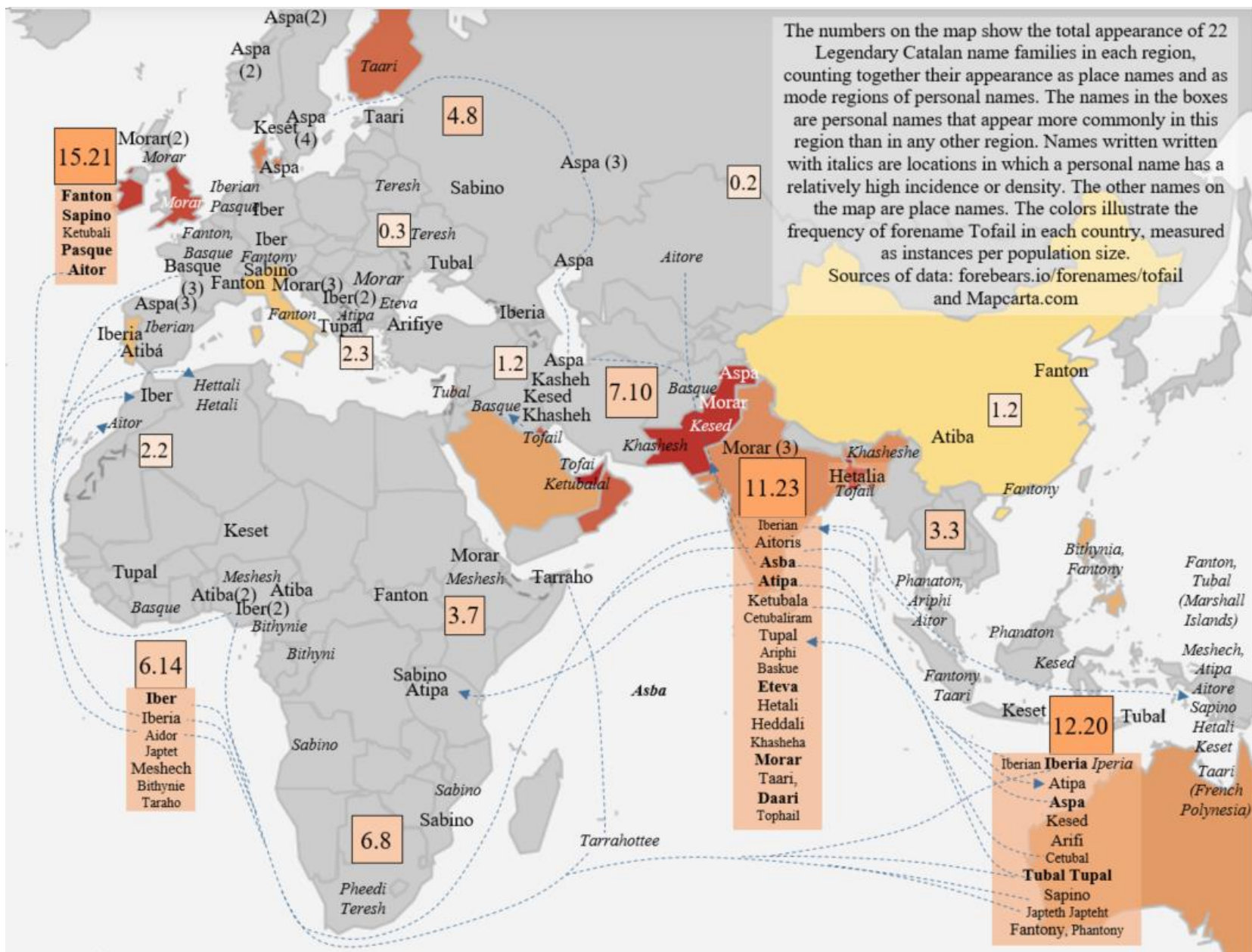
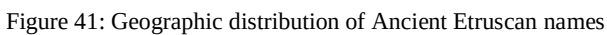


Figure 40: Geographic distribution of Legendary Catalan names

Etruscan names

The Etruscan name set was obtained by selecting the names of the Etruscan mortals (as opposed to deities) that were listed by [Wikipedia](https://en.wikipedia.org/wiki/Etruscan_names), rejecting the names that had less than five letters. The resulting name set is shown in Appendix table 39; an illustration of the migration of the names from India to Etruria is shown in Figure 41 below. The

calculated urheimat of this name set is Extended India with WUI = 5 (see p. 168). Weighted LCA supports this conclusion, as Sundaland has the second highest appearance of these names and as the appearance figures decline when advancing away from India towards Europe via South and Central Africa. This conclusion matches with Santos, according to whom the Etruscans received their language from India (see p. 137).



Kalevalan names

the name set is illustrated in Figure 42 below. The names *Vaka* and *Vka* have been added to the illustration, although they were not included into the statistics. This is because these names tend to appear very close to the other Kalevalan names. This suggests that the first part *Vaka* of the Kalevalan hero “*Vaka vanha Väinämöinen*” would have been the name *Vaka* and not the Finnish adjective *vakaa* (“Stable”). In Sanskrit, the word, *vac/vak* means, “speaking”.

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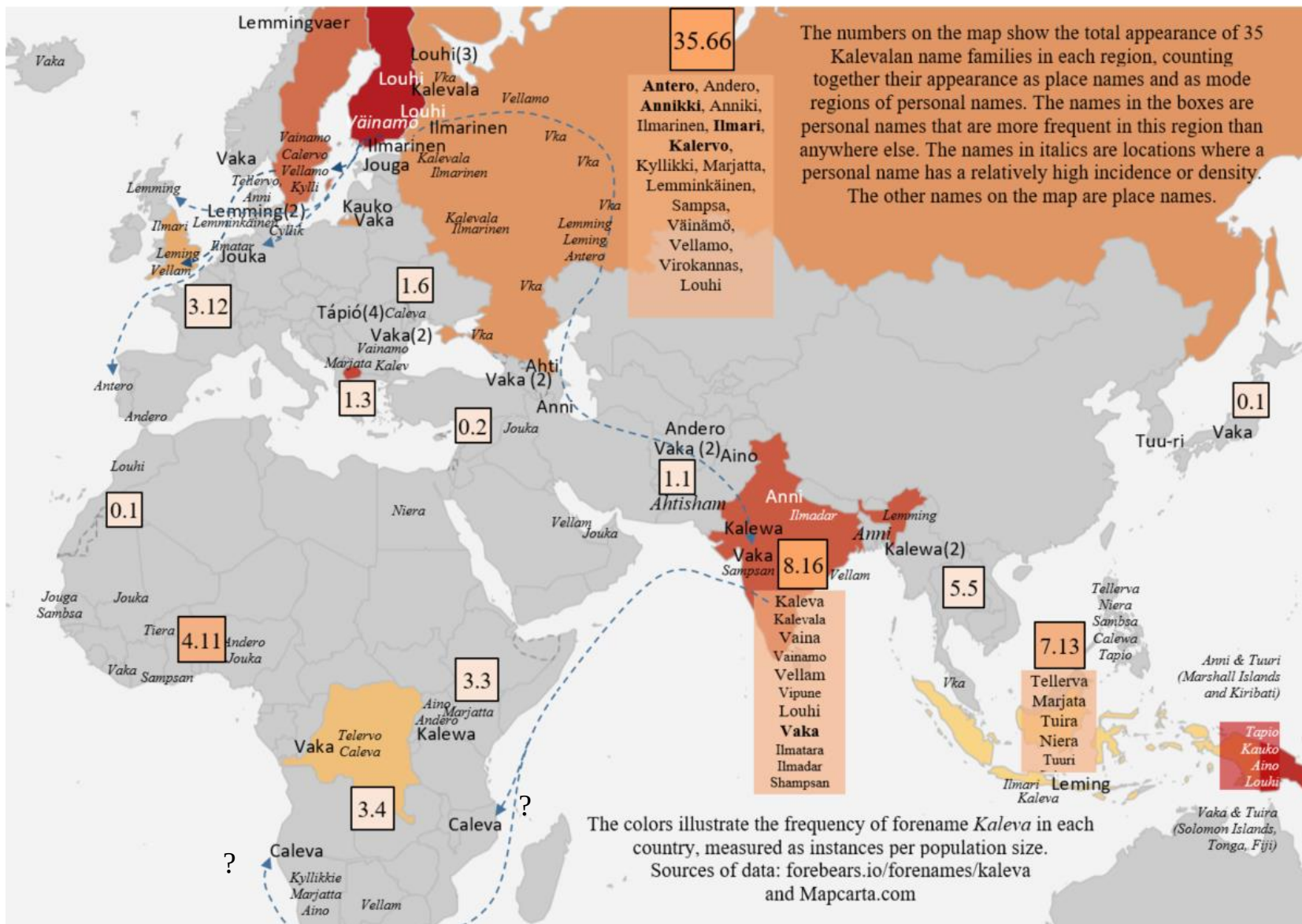
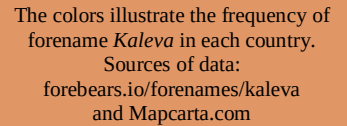


Figure 42: Geographic distribution of Kalevalan names

The calculated urheimat of the name set is in Corded Ware Europe with the WUI = 8 (see p. 168). Based on Weighted LCA, the urheimat of this name set would be most likely in Karelia or along River Volga, as otherwise it would be difficult to explain the high appearance of this name set in India and Sundaland.

The potential Kalevalan colony along river Ganges cannot be explained well by European colonialism of the modern times. This same applies probably to the Kalevalan names in Ireland, Wales, and

Scotland: If people have moved from Finland to the British Isles during modern times, their likeliest destination would have been southern England and not Danelaw and Wales where the Kalevalan names are most common. Figure 43 below combines the genetic flows (p. 143) with a detailed map of the appearance of Kalevalan names in Europe and Western Asia. The migration route from the Baltic Sea to India opens up space for new interpretations of the Kalevalan hero *Kaukomieli* whose name means literally “*The one who wants to travel far-away*”.



Some incidences of the Kalevalan names in India can be coincidences that have no connection to Finland. For example, the word *kaleval* means a “Post of a barnyard” in Sanskrit and *kalevara* means “Body”. These words could possibly be the roots of the Indian names *Kaleva* and *Kalevala*.

The name set of the Norse Gods was obtained from Wikipedia taking to the name set all Old Norse

names that were marked as divine names. The name set was extended by the names *Vanir* and *Æsir*, which were the two tribes that arrived to Northern Europe from *Asgård*, which was located “in the east” according to Norse sagas (Völuspá, Skáldskaparmál, and Ynglinga saga). The detailed geographic distribution of the name set is shown in Appendix table 45 and the regional summary in Appendix table 46. The geographic distribution of the names is illustrated into Figure 44.

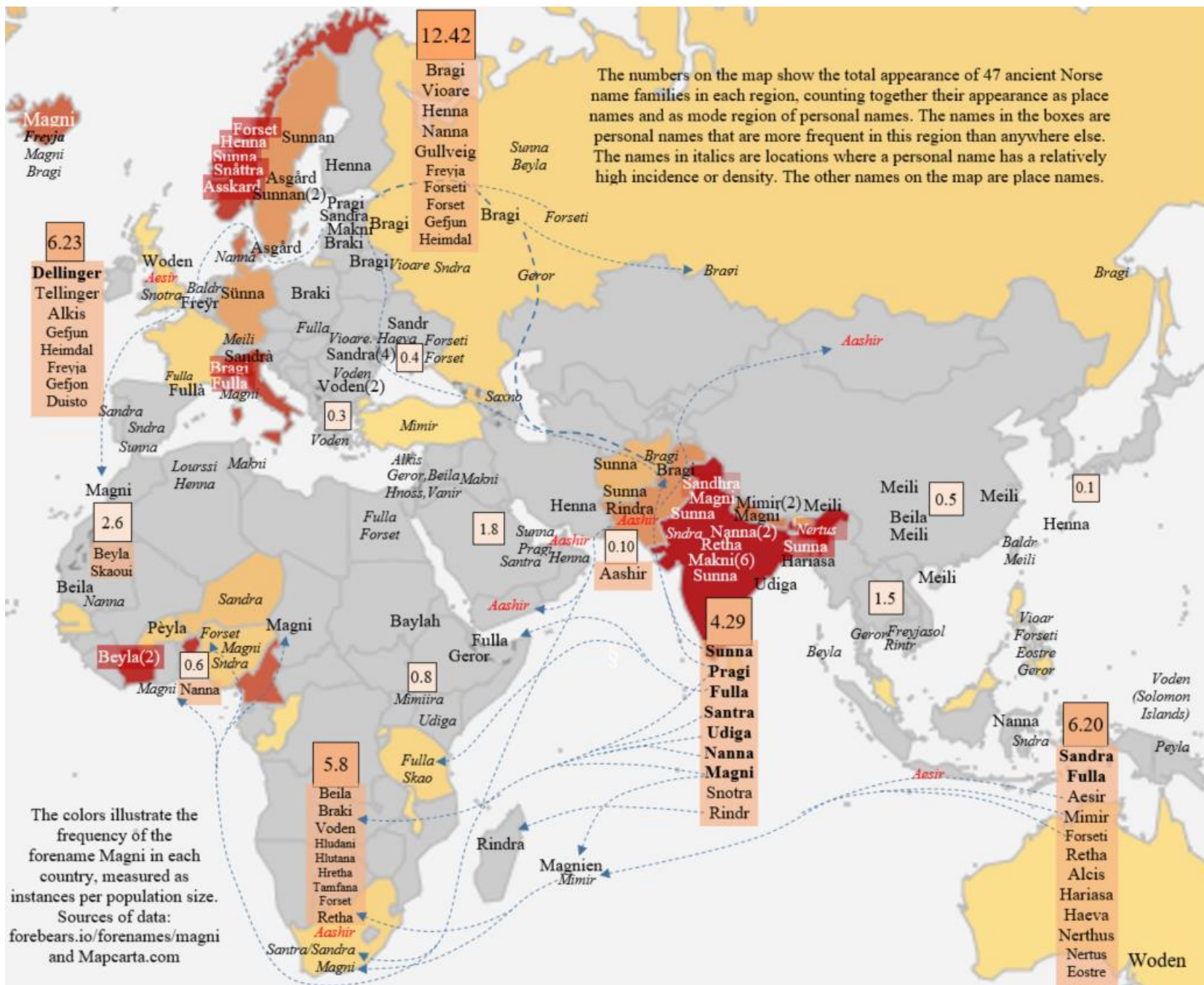


Figure 44: Geographic distribution of the names of the Norse gods

The calculated urheimat of this name set is Corded Ware Europe with WUI = 8 (see p. 168). Weighted LCA does not provide a clear urheimat, unless the short names are given as much weight as the long names. In that case, the urheimat would be along the river routes from the Baltic Sea to the Caspian Sea, and the appearance of the names would decline when going from Corded Ware Europe towards Bell Beaker Europe or from Gedrosia and India towards Sundaland (see Appendix table 46). Based on GAHAH, the migrations from the North Sea and

Baltic Sea to India occurred in 6–10 migration waves 5218–346 BCE (p. 168). However, there was also migration from south to North, at least from Chuvash to Karelia and from Afghanistan to Norway and the British Isles (see p. 168). These south-to-north migrations match with the Nordic sagas, according to which the *Aesir* came from Asgârd, which was somewhere in the east. The distribution of the *Aesir*/*Aashir* name as an anthroponym has been highlighted to the map with red color. The distribution of the Old Norse names matches also

Druidic names

The numbers on the map show the total appearance of 45 Druidic name families in each region, counting together their appearance as place names and as mode regions of personal names. The names in the boxes are personal names that are more frequent in this region than anywhere else. The names in *italics* are locations where a personal name has a relatively high incidence or density. The other names on the map are place names.

Legend:

- Conroy
- Emrys
- Byron
- Druidi
- Kallaghan
- Neesgan
- Taliesin
- Konroy
- Aoife
- Amergin
- Druidic
- Muirgen
- Myrdin
- Truid

Regions and Names:

- North America:** 2.37. Names: Conroy, Emrys, Byron, Druidi, Kallaghan, Neesgan, Taliesin, Konroy, Aoife, Amergin, Druidic, Muirgen, Myrdin, Truid.
- Europe:** 2.4. Names: Amari, Vinna, Druid, Myrdin, Myrdin, Winna(4), Brenon, Vinná, Singham, Druidi(2), Callaghan, Druidia, Ballari, Brenon(2), Pallare, Murugan, Ballar, Ballar(2), Ballar, Chossack, Anman, Ballar, Anman, 2.5, Khossa, Balār, Ballar, Madan, Manannan, Mongan, Vinna, Pallarguda, Ballarpur, Gaine, Ballari, Vinna, Pallar(2), Murugan, 1.2, Mon Kan, Kamma, 1.2, Mon Kan, Singam, Dubhtach, Winna, Ballar, Cathbat (Solomon Islands), Mongan, Fiteima, Ballar, 8.14, Ballar, Mongan, Nesan, Vinna, Fidelma, Wynna, Cathbat, Dubhtach.
- Asia:** 1.3. Names: Manan'an.
- Africa:** 6.7. Names: Nesan, Wynna, Madan, Murugan, 1.3, Matan, Amerkin, 9.9, Callaghan, Khossa, Tennyson, Dennyson, Brennon, Cathbate, Anmannannem, Truidie, 9.12, Khossa, Morgan, Tennyson, Winna, Monkan, Druid, Anmannannem, 9.12, Khossa, Morgan, Tennyson, Winna, Monkan, Druid, Anmannannem.
- Oceania:** 1.3. Names: Manan'an.

The colors illustrate the frequency of forename *Murugan* in each country, measured as instances per population size. Sources of data: forebears.io/forenames/murugan and Mapcarta.com

The Druidic names were picked from Kidald.com, taking all Druidic names that were characterized as Old Irish, Welsh, or English names. This name set was then extended with the Druidic names that Pathmanathan (1979, 29) had identified as Tamil

names: *Madan, Muirgen, Murugan, Morgan, Mongan, Manannan, Anmann, Tennisan, Tennyson, Callaghan, Taliesin, Taliesingam, Conn, Conroy, Ness, and Nesan* (p. 129–132). The calculated urheimat of this name set is Extended India or Bell

Beaker Europe; both with WUI = 4 (see p. 168). The Weighted LCA provides some weak support concerning the location of the urheimat into Extended India, as India would best explain the high appearance of the Druidic names in Sundaland, Indochina, Southeastern Arabia, and South Africa. Therefore, the Total Reliability of Extended India as the urheimat would be 4+2. However, it is possible that the Druidic names would have originated from Western Europe, from where they would have migrated to the Indian Ocean during the era of colonialism. In addition, the credibility of the concluded urheimat is reduced by the fact that the names of the name set had been partially based on the cherry-picked Druidic names that Pathmanathan (1979, 29) had identified as Indian. Based on this somewhat inconsistent evidence, India was concluded as the urheimat of this name set but the extra 2 points for the Weighted LCA results were not added to this WUI score. Due to the low Total Reliability score (4, unreliable), migration arrows were drawn only for the name families *Ballar/Pallar* (from India outwards) and for the *Druid** name family (from Britain outwards). The migration of these place names from India to West Africa cannot be explained by British colonialism.

Legendary Irish names

Irish mythology recounts the stories of the first people to inhabit Ireland and the origin of the island's name. The list of mythological Irish names was obtained from the Irish myth *Lebor Gabála Éirenn* (The Book of the Takings of Ireland). The full geographic distribution of the name set is shown in Appendix table 59 and regional summary in Appendix table 60. Figure 46 on page 198 illustrates the geographic distribution of the names in Eurasia and Africa.

The calculated urheimat of this name set is Bell Beaker Europe with WUI = 8 (see p. 168). Weighted LFA, however, would locate the urheimat to the

northern coast of the Indian Ocean: The combined appearance of this name set at the coastal regions of the Indian Ocean (24.44) is higher than the combined appearance in Europe and West Africa (17.31).

It seems that the names *Amergin*, *Dannan*, *Espain*, *Cuill*, *Tara*, *Mil*, and *Ir* would have migrated to the Afghanistan–Pakistan region via the Baltic–Volga–Caspian route, as the names *Amergin*, *Danna*, *Tuatha*, and *Mil* appear relatively densely in Russia above the Caspian Sea. In the Afghanistan–Pakistan region, the names *Banba*, *Panba*, and *Tara* appear most densely at the region where the Kalash people live and the Kalash share genes with the Irish people (p. 143). According to GAHAH, there were 6–10 migration waves from the coasts of the North Sea to the Afghanistan – Pakistan region around 5218–346 BCE (see p. 168). However, some names like *Tara* may have migrated to the opposite direction.¹⁷⁷ The dense appearance of the names *Amerkin*, *Milesia*, *Milesiana*, *Eriu*, *Panba*, and *Milith* in Uganda can be probably explained by the period when the Protectorate of Uganda imported about 32,000 Indian laborers to build a railroad, and 6724 stayed in Uganda after the work was completed. The appearance of the names *Milith*, *Dannan*, *Banba*, *Dara*, and *Ir* in West Africa matches with the India → West Africa hypothesis, which is already supported by moderate or strong genetic, linguistic, and historical evidence (see chapter 4.5). Yet, it is also possible that the names would have migrated to West Africa along with the British colonialists. This hypothesis, however, could be refuted by showing that the settlements *Danna* and *Ir* existed in West Africa before the period of European colonialism. The appearance of the name *Danna* in Sicily illustrates the difficulty of reconstructing migration paths at the Mediterranean region. This name could have migrated to Sicily from the Middle East, from the British Isles via France, or from West Africa via Gibraltar.

¹⁷⁷ *Tara* is a Sanskrit word that means “To cross”.

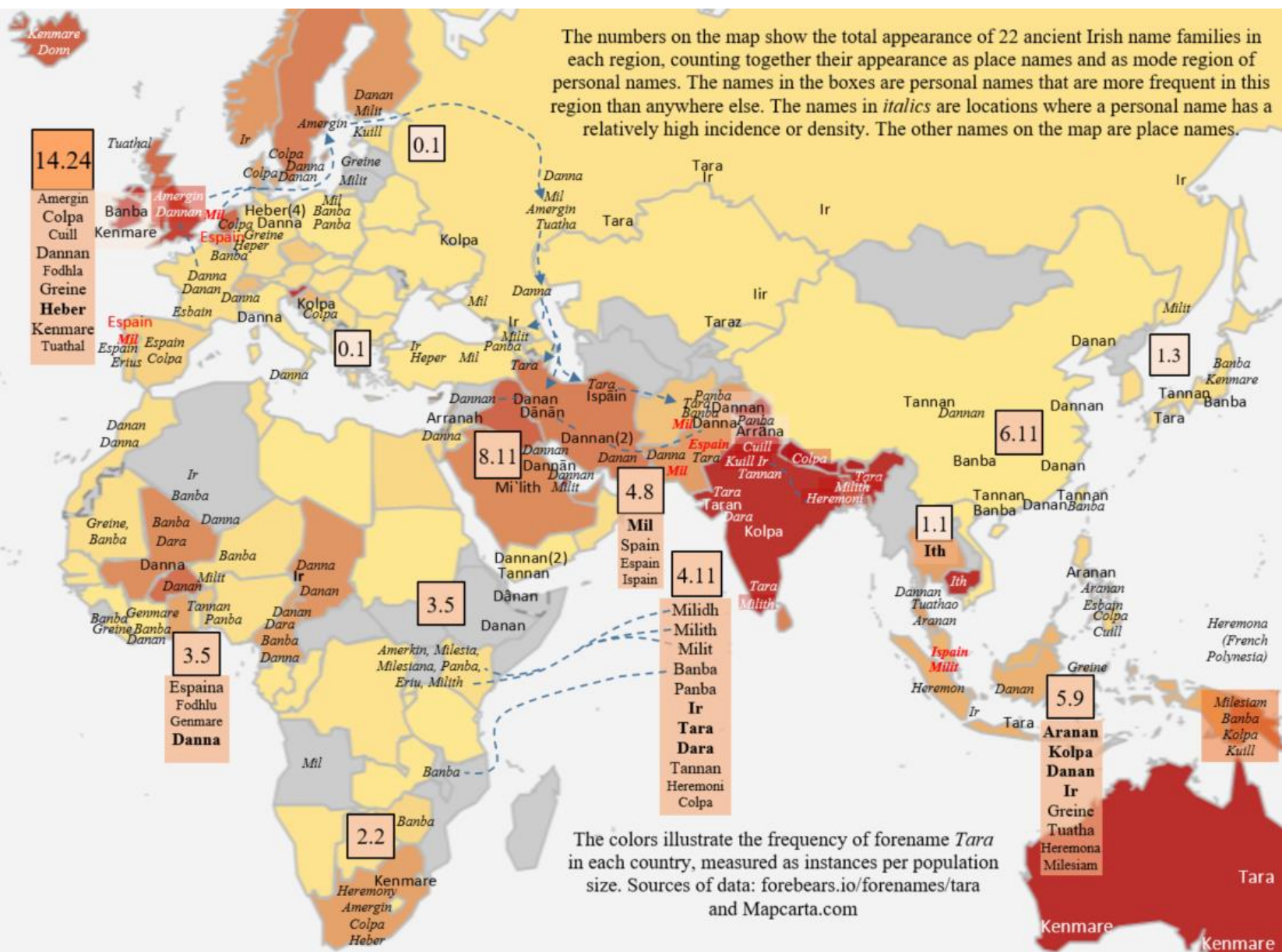


Figure 46: Geographic distribution of the Legendary Irish names

5.12 Plato's Atlantean names

The name set of Plato's Atlantean names was based on Plato's story of Atlantis, which he claimed to originate from the Greek political leader *Solon* who had heard the story from Egyptian priests while he was in Egypt researching the history of Greece. The genre of Plato's story has generally been classified as fiction, but it is also possible to classify it as *amateur proto-science* in the field of history, geography, and folkloristics. The story of Atlantis does not match the definition of fiction, as Plato

claimed it to be true except for some details, which he considered unreliable and of which he warned the reader. Plato, for example, did not consider it credible that the plain of Atlantis would have been separated from the continent of Atlantis by a 1500 km long ditch that was 150 m wide [Criti. 118]. Plato's style and his way of dating the story to ~9600 BCE matches with Herodotus, who believed that Egypt was founded approximately at that time. In addition, Herodotus [VII.21] and Aelian [N.A. 17.29] reported even more incredible details of the huge armies of some distant Asiatic kingdoms than

the details provided by Plato about Atlantis (see [Franke 2008, 166](#)). The credibility of Plato's story was gradually reduced, as no traces of Atlantis were ever found and as it was considered impossible for an entire continent to drown into the sea.

If Plato's story is interpreted as a work of an amateur folklorist or historiographer, then the *Atlantis legend* that Plato fabricated into one single coherent story could have received narrative elements from several Atlas stories, not just from the Egyptian version. For example, it might have adopted narrative elements from the Atlas/Atlantis stories told by Homer, Herodotus, and the Mauretanians (see p. 56). The Mauretanians located the Atlanteans to West Africa, and presented them as a very advanced tribe.¹⁷⁸ Homer located the island of Atlas (= Atlantis) to the other side of Africa.¹⁷⁹ Pliny the Elder located an island called *Atlantis* to the Gulf of Guinea, approximately at the same meridian as Carthage [[Nat. Hist. II.36.106](#)]. This matches with the location of Sao Tome and Principe, and with Bioko. Yet, the purpose of this chapter is not to identify the location of Atlantis, but to locate the urheimat of the name set of Plato's Atlantean names.

Plato mentions the following anthroponyms and toponyms in his story: *Atlas*, *Azaes*, *Autochton*, *Diaprepes*, *Evaemon*, *Elasippus*, *Mestor*, *Mneseus*, *Gadeirus*, *Atlantis*, *Atlantean*, *Gadeira*, *Gades*, *Leucippe*, *Evenor*, and *Cleito*. According to Plato, the names *Gadeirus* and *Gadeira* were definitely Atlantean names whereas some other names mentioned in his story were translated or transcribed by Solon from their original Atlantean form [[Plat. Criti. 113](#)]. The next chapters handle separately the *Gadeirus* name family and the other potentially Atlantean names.

Gadeir* name family

This name set was formed by removing the Latin ending *-us* from the name *Gadeirus*, and by generating variants based on the variation rules. The resulting name set, which consisted of 18 longer and 5 shorter variants of the *Gadeirus* name, is shown in Appendix table 52 and the regional summary in Appendix table 53. The geographic distribution of the name family is illustrated into Figure 47 on page 200. Three names were added to the map, but were not included into the statistics. These names are *King Gadarat* of Aksum who lived from approximately 250 CE (Munro-Hay 1991, 75) and the place names *Gady* and *Gadie River* from Scotland.

The calculated urheimat of this name set is Extended India with the reliability score of 6 (see p. 168). Weighted LCA would suggest a potential urheimat in West Africa. The Indian urheimat, however, matches with the etymological study, according to which the likely root of this name family is *Gade** (see p. 89). Based on the archaeological deduction rule concerning variance (see p. 63), the appearances of this name family in Maghreb are younger than the appearances in India and in West Africa. The migration of the *Gadeir* name family from India to West Africa could have occurred via various routes. The likeliest migration route is via East and Central Africa, which is supported by the place name *Gader* in East Africa and *Gadara* in Chad. One somewhat less likely route would have been the sea route around Africa, which is supported by the India → West Africa hypothesis (see p. 126). The least likely but yet possible would have been the sea route from Carthage to West Africa. This is supported by the travels of Hanno the Navigator, who sailed from Carthage to West Africa during the 7th century BCE.

¹⁷⁸ Based on Diodorus Siculus [[Libr. Hist. III.54.5](#)]

¹⁷⁹ According to Homer, the island of Atlas was located next to Aethiopians (Africans) at the extreme end of Aethiopia,

close to the region where the Phaeacians lived [[Hom. Od. 5](#)]. In the Greek language, the island of Atlas is "Atlantis island".

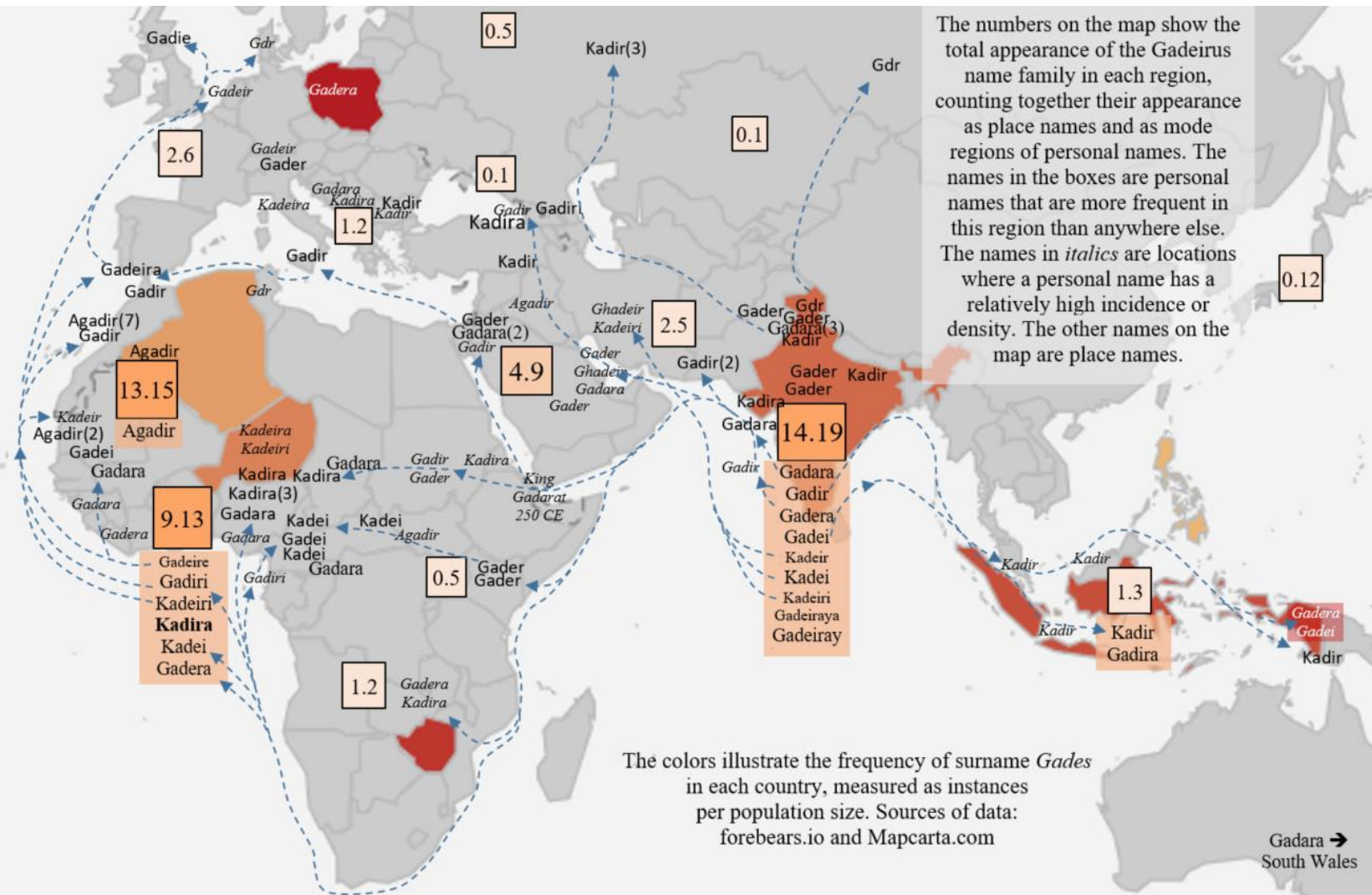


Figure 47: Geographic distribution of the name Gadeir and its variants

Potentially Atlantean names

The name set of the Potentially Atlantean names was formed based on the anthroponyms and toponyms that Plato mentioned in his story of Atlantis (see p. 199) and by removing from this set *Autochton*, *Cleitō*, and *Leucippe*, which have a somewhat clear meaning in the Greek language. These names were removed, as they would have been Solon's translations from the original Atlantean names. The other names, which did not have a clear meaning in Greek, would have been transcribed, not translated. The resulting name set is shown in Appendix table 54. The regional summaries are shown in Appendix table 55, and an illustration of the results is given in Figure 48 (p.

201). An island called *Atlantis* has been marked in front of Cameroon based on Cornelius Nepos and Pliny the Elder who located it at the *same meridian as Carthage, at the other side of Africa* [Nat. Hist. V.8]. The large African zone called *Atlantia* has been drawn to the map based on Pliny the Elder, according to whom the former name of Sub-Saharan Africa was *Atlantia*, before people started to call it *Aethiopia* [Nat. Hist. VI.35]. The *Atlantis Sea* is the "Sea of Atlas" that Herodotus mentions as the sea that reaches from Iberia to India.

The calculated urheimat of this name set is Extended India or Sundaland; both with the reliability score of 3 (see p. 168). According to Weighted LCA, India is the more likely urheimat, as it is a more central location meaning that it better explains the

appearance of the names in Middle East, Gedrosia, and Corded Ware Europe. The map shows potential migration paths for the names from the Indian Ocean to West Africa, starting the arrows from the

urheimat.

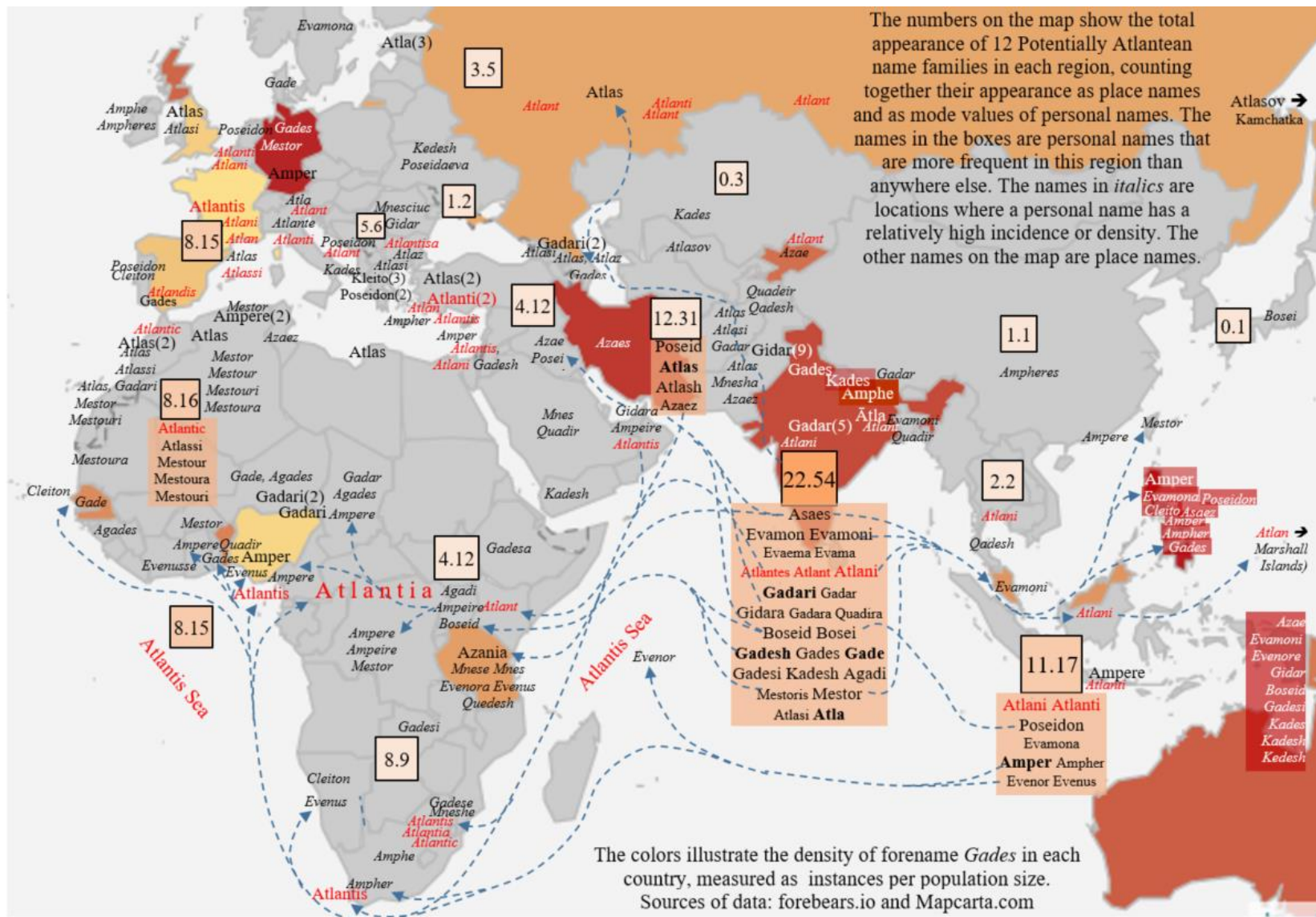


Figure 48: Geographic distribution of Plato's Potentially Atlantean names

An alternative explanation for the distribution of the Potentially Atlantean names is that these names would have been born at the coasts of the Mediterranean Sea, then migrating to their current locations during the era of colonialism. This interpretation, however, does not explain why the *Atlas/Atlan** name family appeared at the coasts of the Atlantic Ocean and Indian Ocean already before the first millennium CE, based on the writings of Homer, Herodotus, Diodorus Siculus, and Pliny the

Elder. In addition, colonialism is not a good explanation for the appearance of the place names *Amper* & *Ampere* in Sundaland, *Atlas* & *Atlasov* in Russia, *Azania* in Tanzania, and *Gades*, *Kades*, *Amphe*, and *Atla* in India. A third possible interpretation of the distribution of the Potentially Atlantean names is that Plato invented these names and then his famous story of Atlantis carried these names to Sundaland, Africa, and India, where the local people used them when giving names to places

and to their children. This *imagination hypothesis*, however, is based on the assumption that people of Southeastern Asia, India, and Africa would have read Plato's story. According to an alternative interpretation, some of the names and narrative elements of Plato's story would have actually originated from India or Sundaland.¹⁸⁰

5.13 Name sets as evidence for the migration hypotheses of the theory

Once the urheimats of the name sets and some migration paths of name families had been identified based on the principles described in chapter 5.2 (p. 165), it was possible to use the urheimats and migration paths as evidence of migrations from India to Europe, Africa, or Middle East. When the name sets fulfilled at least one of the following criteria in connection to some specific migration hypothesis, evidence was documented. If more than one criteria were met, the strength of the evidence was increased. The criteria were the following:

1. A supposedly African or European name set had its calculated urheimat in Extended India. This indicated that the name set had migrated to its current African or European locations from Extended India.
2. The appearance figures of the name set declined systematically while distancing from the Indian Subcontinent towards other regions (distances measured by travel days via fastest route). This was considered a strong indicator that the geographic distribution of the names was not caused by random emergence of similar names at different regions.
3. Some name families of the name set showed a relatively clear migration path from Extended India to the destinations of migration.

4. The name set had its calculated urheimat in its supposed urheimat (in Europe or Africa) and second highest appearance in India. This indicates migration from Europe or Africa to India, which indicates a *counter-current* of migration.¹⁸¹
5. The name set had its assumed urheimat and calculated urheimat located in such a fashion that the migration route between these regions must have passed through some specific region. Based on this, it is likely that migration to this intermediate region would have occurred.

The strongest case was when the criteria 1–3 were met at the same time. Ancient West African names are an example of this case (p. 184). Their assumed origin was West Africa and yet they have their calculated urheimat in Extended India. In addition, their appearance figures decline systematically when moving away from India, and some of the Ancient West African name families reveal a likely migration path from India to West Africa. In this case, the name set of the Ancient West African provides *tentative or moderate* evidence for the India→West Africa migration path (p. 204). However, if the calculated Total Reliability of the urheimat was only 4–5, then the evidence was considered only *tentative* (4–5).

A slightly weaker case appeared when only criteria 2 and 3 were met. An example of this is illustrated by the Indo-Asiatic names, which have their Urheimat in the Indian Subcontinent with declining appearance figures when distancing away from this region. In this name set, the names *Indra*, *Indus*, and *Asia* show a potential migration route from India to the Baltic countries and Norway via eastern river routes (p. 172). Based on this, the Indo-Asiatic names provided *tentative* evidence for the India→Caspian→North Sea migrations.

¹⁸⁰ This interpretation is supported by Plato's description of the nature of Atlantis. According to Plato, Atlantis was a 450 km long semi-artificial island which was separated from a large continent by a very long ditch, and this continent had a very big population of elephants [Criti. 114e]. The Atlanteans cultivated an unknown woody fruit, the contents of which could be used for food, drink, and ointment [Criti. 115b]. The most feasible interpretation of this woody fruit is coconut. Coconuts and elephants match best with the flora and fauna of India, although elephants and coconuts could have possibly

appeared also in Sundaland and in Africa at prehistoric times. The location of the urheimat of the Potentially Atlantean names to Sundaland or India matches with Plato's narrative element of a sunken continent: An island that was ~450 km long drowned into the Indian Ocean west from the Gulf of Khambhat around 10,000–6000 BCE due to rise of sea level after the Ice Age. In addition, the continent of Sundaland drowned into sea at the same time at the current location of Malaysia, Indonesia, and Philippines.

¹⁸¹ Ernst Ravenstein 1880's; referenced by McSparron 2023

Another weaker case appears when only criteria 3 and 4 are met. This occurred, for example, with the Kalevalan names, which have their assumed and calculated urheimat in Corded Ware Europe. Yet, this name set contained some name families that were much more common in India than in Northern Europe and which showed a tentative migration path from India to Northern Europe (see p. 193). This case provided *tentative* evidence for the India→Caspian→Baltic migrations.

One more instance of the weaker case arises when criteria 3 and 5 are satisfied. An example of this is migration from India to East Africa. The name set of Ancient West African names has its assumed urheimat in West Africa and calculated urheimat in India. This indicates migration between these regions, and the name set shows tentative migration paths from India to East Africa at the level of some name families. As East Africa is an intermediate region on the route from India to West Africa, the criteria 3 and 5 can be used as *tentative* evidence concerning migrations from India to East Africa.

In the weakest case only the criterion 3 was met, meaning that some name families showed a potential migration path from India to Europe or Africa. An example of this is the potential migration of the Archaeological African name *Benin* from India to Belorussia via Eastern Turkey (see p. 182). These deduction rules were used for rating the evidence that the research data provided in support of the hypotheses of the India–Africa–Europe theory (see chapter 4.6–5.14). It must be noted, however, that the evidence was usually limited to the migration routes and not for the entire hypotheses, which contained also the period of migration.

Onomastic evidence for the India→East Africa migrations

According to this hypothesis, *there were several migration waves from India to East Africa 3300–500 BCE*. The strongest evidence that supports this hypothesis comes from the Kushite, Ethiopian, Indo-Asiatic, Legendary African, and Ancient West African name sets.

Indo-Asiatic: The urheimat of this name set is in India with the Total Reality score of 7 (reliable). The appearances of the names decline when advancing from India towards West Africa via East Africa. In addition, the names *Andhaka*, *Sagara*, and *Asia* seem to have migrated to the Uganda–Tanzania region from India (p. 172). Although the migrations cannot be dated based on onomastic data, the location of migrations matches with the region, at which Asian bananas have been found, dating to ~3320 BCE. In total, the Indo-Asiatic name set can be treated as *moderate (or strong)* evidence concerning migrations from India to East Africa.

Kushite: This name set has its assumed urheimat in East Africa, but the calculated urheimat is located in India with the Total Reliability score of 6 (good candidate for urheimat). In addition, the names *Shabaka* and *Kurru* seem to have migrated to East Africa from the Indus Valley (p. 181). This can be rated as *tentative or moderate* evidence concerning migrations from India to East Africa.

Ethiopian: This name set has its assumed urheimat in East Africa, but the calculated urheimat is located in India with the Total Reliability score of 4 (unreliable). In addition, the names *Amara*, *Kamali*, and *Nyala* seem to have migrated to East Africa from India (p. 179). This can be rated as *tentative* evidence.

Legendary African: The legendary East African names Kintu, Nambi, and Nyikang are more common in India than in East Africa. These names refer to the oldest ancestors of Ugandan and Sudanese peoples, according to local traditions (p. 185). According to the East African traditions, Kintu and Nambi arrived to East Africa from a far-away place. This can be rated as *tentative* evidence.

Ancient West African: The assumed urheimat of this name set is in West Africa, whereas the calculated urheimat is in India. This indicates migration from India to West Africa. In addition, the name *Magi* shows a potential migration path from India to Ethiopia (p. 184). This can be rated as *tentative* evidence.

In total, the onomastic evidence concerning the migrations from India to East Africa seems to be *moderate (or strong)*. When this is combined with the *moderate or strong* evidence presented in chapter 4.4 (p. 133), the total evidence supporting the India→ East Africa hypothesis can be reduced to *moderate (or strong)*. Some additional weaker evidence in support of this hypothesis has been presented in Appendix table 63.

Onomastic evidence for the India→ West Africa migrations

According to the India→ West Africa hypothesis, *Indians founded a colony into tropical West Africa 3000–2500 BCE or 1550–100 BCE*. The names study revealed two name sets in which the assumed urheimat was in Western Africa, calculated urheimat was in Extended India, and West Africa was the region of second highest appearance (see #1 and #2 in Table 45).

Table 45: Name sets as evidence for the migrations from India to West Africa

#	Name set	Urheimat (reliability)	Names that seem to have migrated from the Indian Subcontinent to West Africa via South or Central Africa	Strength of evidence
1	Ancient West African	Extended India (5+1)	<i>Atlant/Atlantes</i> , <i>Nigris</i> , <i>Drepani</i> , and <i>Magi</i> appear in India as anthroponyms and in West Africa as place names (p. 184). <i>Magi</i> , <i>Barisa</i> , and <i>Masure</i> appear close to each other as place names in Southern Chad and in India.	Tentative or moderate
2	Sea People	Extended India (6+1)	<i>Lucca</i> , <i>Teres</i> , <i>Danuna</i> , <i>Weshesh</i> , and <i>Shekel</i> appear commonly in India and in West Africa and show a migration path from India to West Africa either via or around Africa (p. 186).	Tentative or moderate
3	Ancient Iberian	Extended India (6+2)	<i>Amaina</i> , <i>Bantu</i> , and <i>Budar</i> seem to have migrated to Nigeria from India (p. 188).	Tentative
4	Etruscan	Extended India (5+1)	<i>Achle/Achile</i> and <i>Vilates/Vilate</i> show a tentative migration path from India to West Africa via South Africa (p. 192).	Tentative
5	Indo-Asiatic	Extended India (6+1)	<i>Sagara</i> , <i>Narmada</i> , <i>Assam</i> , and <i>Asia</i> seem to have migrated to West Africa from India via Africa (p. 172). The names <i>Assam</i> and <i>Asia</i> suggest a migration route around the Cape of Good Hope.	Tentative
6	Euhemerian	Extended India (5+2)	<i>Oceanite</i> , <i>Asterusu</i> , and <i>Achaea/Achea</i> seem to have migrated to West Africa from India, although the migration path remains unclear (p. 176).	Tentative
7	Gadeir* name family	Extended India (6+1)	The many variants of this name family show a potential migration path from India to West Africa via Central or South Africa (p. 200).	Tentative
8	Hyksos	Extended India (7+2)	<i>Chayan/Khaya</i> seems to have migrated from India to Senegal via South Africa. <i>Sakir–Har</i> seems to have migrated from India to Arabia and to Nigeria (p.180).	Tentative
9	Potentially Atlantean	Extended India (3+2)	<i>Atlan*</i> , <i>Gade*</i> , and <i>Mestor</i> seem to have migrated from India to West Africa via Eastern or Southern Africa (p. 201)	Tentative
10	Phoenician	Extended India (5)	<i>Shama</i> and <i>Batno</i> are most common in India as anthroponyms, and they appear as place names in West Africa (p. 178). This suggests that <i>Shama</i> and <i>Batno</i> (as persons) might have migrated to West Africa.	Weak or tentative
11	Berber and Libu	Extended India (5.5+2)	<i>Atala</i> seems to have migrated from India to Senegal via East and Central Africa and via the Nigeria–Cameroon region (p. 187).	Weak or tentative
12	Indigetean	Extended India (3+2)	<i>Indica</i> seems to have migrated to West Africa via East and South Africa (p. 189). <i>Tichis</i> may have migrated to Senegal via the Niger–Nigeria region.	Weak or tentative
Total				Moderate

This suggests migrations from India to West Africa, and totals up to *tentative or moderate* evidence in support of the India → West Africa hypothesis. In addition, West Africa seems to have been an intermediate location on the route from India to Iberia (#3) and Etruria (#4) based on the tentative migration paths. Additional support is received from name sets 5–12 which all have their calculated urheimat in India and yet show tentative migration paths to West Africa. As there is so much coherent tentative or moderate evidence, the total strength of evidence was rated as *moderate*. When this evidence is combined with the *moderate (or tentative)* evidence provided in chapter 4.5 (p. 126), the total evidence supporting the India → West Africa hypothesis remains *moderate (or tentative)*. Additional weaker evidence is presented in Appendix table 64.

Onomastic evidence for the India–Maghreb migrations around Africa

According to the India → Maghreb hypothesis, *Indian migrants arrived to Mauritania and Maghreb 1550–200 BCE via the route around Africa*. The strongest evidence was obtained from the Ancient Iberian names, which had their assumed urheimat in Iberia, their calculated urheimat in Extended India, and their second highest appearance in West Africa. This distribution suggests migrations from India to Iberia via the coastline of West Africa and Maghreb (see p. 188). In total, the name sets provided *tentative* evidence concerning the migrations from India to Maghreb via Sub-Saharan Africa or around the Cape of Good Hope. When this evidence is combined with the tentative (or moderate) evidence presented in page 125–129 the total combined evidence remains *tentative (or moderate)*.

Table 46: Name sets as evidence for the India → Maghreb migrations around Africa

#	Name set	Urheimat (reliability)	Names that seem to have migrated from the Indian Subcontinent to Maghreb	Strength of evidence
1	Ancient Iberian	Ext. India (5.5+2)	<i>Nabar</i> is most common as an anthroponym in India and it appears as a place name in Senegal (p. 188)	Tentative
2	Berber and Libu	Ext. India (5.5)	<i>Ridha</i> seems to have migrated from India to Maghreb via South Africa (p. 187)	Tentative
3	Sea People	Ext. India (6)	<i>Lukka/Lucca</i> seems to have migrated from India to Morocco via West Africa (p. 186)	Tentative
4	Indigeteian	Ext. India (3+2)	<i>Tichitt/Tichy</i> may have migrated from India to Maghreb via East, South, and West Africa (p. 189)	Weak or tentative
	Gadeir* name family	Extended India (6+1)	<i>Gadir</i> , <i>Gadei</i> , <i>Kadei</i> , <i>Gadara</i> , and <i>Gadera</i> seem to have migrated to West Africa and Maghreb via Sub-Saharan Africa (p. 200), although migration via Africa seems more likely than migration around Africa.	Weak or tentative
	Hyksos names	Extended India (7+2)	<i>Chayan</i> , <i>Khayran(i)</i> , <i>Sakir</i> , and <i>Har</i> seem to have migrated from India to Maghreb via South Africa (p. 180)	Weak or tentative
	Potentially Atlantean	Extended India (3+2)	<i>Gadari</i> and <i>Mestor</i> seem to have migrated to Maghreb from India via West Africa (see p. 201)	Weak or tentative
	Euhemerian	Extended India (5+2)	<i>Hiera</i> seems to have migrated from India to Maghreb via West Africa (see p. 176)	Weak
	Phoenician	Extended India (5)	<i>Aradus</i> , <i>Barek</i> , and <i>Baali</i> (see p. 178); migration via the Mediterranean Sea is an alternative explanation	Weak
	Legendary Catalan	Bell Beaker Europe (4)	<i>Aitor/Aitoris</i> , <i>Hettali</i> / <i>Hetali</i> / <i>Hedali</i> and <i>Iberian/Iber</i> may have migrated from India to Maghreb via West Africa (p. 191); Spanish colonialism is an alternative explanation.	Weak
	Norse Gods	Corded Ware Europe (8+0)	<i>Magni</i> seems to have migrated from India to Morocco via South and West Africa (see p. 195)	Weak
Total				Tentative

Onomastic evidence for the India – Western Europe migrations

According to the India→Africa→ Western Europe hypothesis, *a large group of Dravidian speakers sailed to West Africa at some point of time 1500–500 BCE and to Western Europe 1500–200 BCE.* The strongest evidence for this migration route was offered by the Ancient Iberian, Indigetean, and Etruscan name sets, which had their assumed urheimat in Western Europe whereas calculated

urheimat was Extended India and the second highest appearance was in West Africa. In addition, some names of these name sets showed a tentative migration path from India to Western Europe around Africa. This provides relatively strong evidence of migrations from India to Iberia or Etruria around Africa. Table 47 below shows the name sets that provided at least tentative evidence for the India→Africa→ Western Europe migrations.

Table 47: Name sets as evidence for the migrations from India to Western Europe around or via Africa

Name set	Urheimat (reliability)	Second highest appearance	Names that seem to have migrated from the Indian Subcontinent to Western Europe around the Cape of Good Hope	Strength of evidence
Ancient Iberian	Ext. India (5.5+2)	Bell Beaker Europe & <u>West Africa</u>	<i>Bantu</i> , <i>Nabar</i> , and <i>Amaina</i> seem to have migrated from India to Western Europe via West Africa (p. 188)	Tentative or moderate
Etruscan	Ext. India (5+2)	Sundaland & <u>West Africa</u>	<i>Easun</i> , <i>Achle/Achile</i> , <i>Memnu/Memnun</i> , and <i>Caphne/Kapne</i> seem to have migrated from India to Britain and to the western coasts of the Mediterranean Sea via West Africa (p. 192),	Tentative or moderate
Indigetean	Ext. India (3+2)	Bell Beaker Europe	<i>Indika</i> , <i>Indica</i> , <i>Ampuri(as)</i> , <i>Junkari(a)</i> , <i>Tichis</i> , <i>Indibilli</i> , and <i>Andobales</i> seem to have migrated from India to Iberia via South and West Africa (p. 189)	Tentative or moderate
Sea People	Ext. India (6+2)	<u>West Africa & South Africa</u>	<i>Lucca</i> and <i>Teres</i> seem to have migrated from India to Western Europe via East, South, and West Africa (p. 186)	Tentative
Berber and Libu	Ext. India (5.5+2)	Sundaland & Bell Beaker Europe	<i>Atala</i> and <i>Atalaia</i> seem to have migrated from India to Iberia via West Africa and Cap Verde (p. 187)	Tentative
Ancient West African	Extended India (5+1)	<u>West Africa & East Africa</u>	<i>Atlan/Atlante</i> , <i>Nigris</i> , and <i>Magi</i> may have migrated from India to Italy via the Atlantic Sea, which was the ancient name of the sea that surrounded Africa (p. 184).	Tentative
Dravid* names	India	<u>Western Europe and Sub-Saharan Africa</u>	The <i>Dravid*</i> names originate from India and have diffused to West Africa and to Western Europe, where it also appears as the <i>Travi*</i> variant in Italy (p. 117).	Tentative
Total				Tentative or moderate

Additional support was provided by the Ancient West African names and by the Berber and Libu names, which had their assumed urheimat in Western or Northwestern Africa whereas their calculated urheimat was in India. This distribution of the name sets indicates migrations from India to Western Europe and this is supported by the tentative migration paths from India to Western

Europe, which are illustrated by these name families. In addition, several other name sets that had their calculated urheimat in India and second highest appearance in West Africa, or alternatively, show otherwise a somewhat clear migration path from India to Western Europe around Europe. These name sets have been summarized to Appendix table 65. In total, the names study seemed provide

moderate evidence concerning migrations from India to Western Europe via Africa. However, in some cases, it was unclear whether the migrations would have passed around South Africa or via Central Africa. Therefore, the evidence for the migrations around Africa was rated only *tentative or moderate*. When this evidence is counted together with the *tentative (or moderate)* evidence presented in chapter 4.5 (p. 127), it seems possible to upgrade the total evidence for the India → Africa → Western Europe hypothesis to *tentative (or moderate)*.

Onomastic evidence for the India → British Isles migrations

Based on the names study, the *Dravi** name family seems to have migrated to Britain around Africa, and the identified migration route suggests that the migrations would have occurred before modern times (p. 117). This provides relatively strong support to Hawkins (1965, 28) according to whom *Dravidian* appeared among the earliest documented surnames of Ireland. If this could be confirmed of original historical documents, the evidence would be strong. Now the evidence remains tentative.

Additional evidence was discovered during the study of Legendary Irish names. The names *Mil* and *Espain* have a relatively high frequency as anthroponyms at the borderlands of Pakistan and Afghanistan. This is the location where the Kalash people live, and the Kalash have a very high genetic similarity with the Scottish people. In addition, the name *Mil* has a relatively high frequency also in the Netherlands and the name *Espain* appears as a place name in Belgium. In addition, the relatively long Irish names *Heremoni*, *Milith*, *Milidh*, and *Tannan* have their highest appearance in India (p.198). Based on this, the name set of Legendary Irish names seems to provide *weak or tentative* evidence of the migrations from the Indus Valley region to the British Isles. Based on the legends, these migrations would have occurred at very ancient times, which could be interpreted as times before the Roman conquest of Britain.

In addition, the name set of Catalan names offers some weak evidence for the migrations from India to Britain: The name *Morar* has its highest

appearance in India (p. 191) and it appears as a place name and relatively frequent anthroponym in the British Isles.

When these pieces of evidence are summed up, they provide *tentative (or weak)* evidence of the India → British Isles migrations. When this is combined with the *tentative (or weak)* evidence provided in chapter 4.6 (p. 132), the total evidence for the India → British Isles hypothesis remains *tentative (or weak)*.

Onomastic evidence for the Baltic → Caspian → Indus hypothesis

According to the Baltic → Caspian → Indus hypothesis, *people from the Baltic region migrated to the Indus Valley 5200–200 BCE via eastern river routes*. The best match for this hypothesis was provided by the Kalevalan names, and from the names of Norse Gods and Heroes.

Norse Gods and Heroes: The urheimat of this name set is in Corded Ware Europe with the Total Reliability of 8 (reliable). Yet, there is a relatively high concentration of Old Norse names in India. In addition, the name *Pragi/Bragi* shows a tentative migration path from the Baltic region to Eastern Afghanistan and India via the Volga-Caspian route (p. 195). In addition, the names *Beyla*, *Forseti*, *Geror*, and *Saxno* still appear as anthroponyms along the Volga-Baltic route, although they are rare in most regions of the world. Based on this chain of reasoning, the name set of Norse Gods and Heroes provides *tentative* evidence for the Baltic → Caspian → Indus hypothesis.

Kalevalan: The urheimat of this name set is in Corded Ware Europe with Total Reliability of 9 (reliable). Yet, the names *Ilmatara*, *Ilmadar*, *Kaleva*, *Kalevala*, *Vipune*, *Vainamo*, *Vaina*, *Louhi*, and *Shampsan* are more common anthroponyms in India than they are in Finland (p. 194). This indicates migrations from the Baltic-Karelian region to India.

In total, the onomastic research data provides *tentative (or moderate)* evidence for the Baltic → Caspian → Indus hypothesis. When this is combined with the *tentative or moderate* evidence of chapter 0 (p. 145), the total strength of evidence

concerning the Baltic → Caspian → Indus hypothesis needs to be reduced to *tentative (or moderate)*.

Name sets as evidence for the Pakistan → Caspian → North Sea hypothesis

According to the Pakistan → Caspian → North Sea hypothesis, *people from the Baltic region migrated to the Indus Valley 5200–200 BCE via eastern river routes*. This includes migrations to the British Isles. The best match for this hypothesis was provided by the Indo-Asiatic and Kalevalan names, and from the names of Norse Gods and Heroes.

Indo-Asiatic: The urheimat of this name set is Extended India with the Total Reliability of 6+1 (reliable), and the appearance of the names declines relatively systematically when moving away from India via the fastest routes. The names *Indra*, *Indus*, *Jammu*, and *Asia* show a potential migration route from India to the Nordic and Baltic countries via the Black Sea – Dnepr route. For the place names *Indra* and *Asia*, the migration paths continue from the Baltic region all the way to Norway (p. 172). In addition, the anthroponym *Sindhu* appears relatively widely in Ireland and Scotland, which suggests that this name would have migrated to the British Isles already very long time ago and not during the modern migrations which headed mostly to England.

Norse Gods and Heroes: The urheimat of this name set is in Corded Ware Europe with the Total Reliability of 8 (reliable). Yet, the supposedly Old Norse names *Sandra/Santra*, *Pragi/Bragi*, *Fulla*, *Snotra*, *Magni*, *Rindr*, and *Sunna*, are more common in India than they are in the Northern Europe. This suggests a counter current of migration along the migration path from the North Sea and the Baltic Sea to India. The names *Pragi/Bragi* and *Sunna* show a tentative migration path from India to the Baltic region via Volga, and the surname *Snotra* shows a relatively clear migration path from India to the Caspian Sea and Russia, to Estonia, and then to England (p. 264). In addition, the names *Beyla*, *Forseti*, *Geror*, and *Saxno* appear currently as anthroponyms along the Volga–Baltic route. This distribution of names can be explained by

migrations between the Baltic region and the Indian Subcontinent via the India → Caspian → Volga → Baltic route. This name set offers also an interesting match between legends and empirical reality. The name *Asgård* exists as a place name in several parts of Scandinavia, often close to some Indo-Asiatic place name like *Asia*. This suggests that there is an ethnic connection between *Asgård* and *Asia*. The name *Aashir* (*Æsir*?) appears as an anthroponym densest at the northern coasts of the Indian Ocean. Based on this chain of reasoning, the name set of Norse Gods and Heroes provides *tentative* evidence for the Pakistan → Caspian → North Sea migrations (see p. 195).

Kalevalan: The urheimat of this name set is in Corded Ware Europe with Total Reliability of 9 (reliable). Yet, the names *Ilmatara*, *Ilmadar*, *Kaleva*, *Kalevala*, *Vipune*, *Vainamo*, *Vaina*, *Louhi*, and *Shampsan* are more common anthroponyms in India than they are in Finland (p. 194). This indicates migrations from the Baltic–Karelian region to India and vice versa because of the principle of counter-currents of migration. The Kalevalan names *Ahti*, *Kauko*, *Kaleva*, *Kylli*, *Lemming*, *Sampsa*, and *Vainamo* appear as anthroponyms currently in Britain and in India. In the British Isles, they appear mostly in Scotland, Danelaw, Wales, Cornwall, and Ireland, which suggests that they migrated there before the modern times. In India these names appear usually very close to each other, which suggests ethnically formed communities that had an ancestral connection to Finland, Estonia, or Karelia. The names *Vellam(o)* and *Lemming* show a tentative migration path between Britain and India via Eastern Karelia (see p. 193).

Euhemerian: This name set consists of the names are the names that Euhemerus reported from the island of Panchaia. The calculated urheimat of this name set is Extended India with the Total Reliability of 8. Out of the Euhemerian names, the *Uranus* name family seems to originate from the northern coasts of the Indian Ocean. It shows a tentative migration path from India to Norway via the Caspian → Baltic route (p. 176). This provides *weak*

evidence of the India→Caspian→North Sea migrations.

In total, these four name sets provide *weak or tentative* evidence concerning the Pakistan→Caspian→North Sea migrations. When this is combined with the *weak or tentative* evidence given in chapter (p. 147), the total evidence for the Pakistan→Caspian→North Sea hypothesis remains *weak or tentative*.

Mediterranean Sea as the migration corridor from India to the British Isles

According to the India → Phoenicia hypothesis, *the Phoenicians received a part of their culture and genes from the Indian Subcontinent*. This hypothesis is best supported by the Phoenician, Mitanni, and Indo-Asiatic names.

Phoenician: The calculated urheimat of this name set is Extended India with the Total Reliability of 5+1 (good candidate for an urheimat), and the second highest appearance figures are in Sundaland and Middle East. This suggests migrations from India to Sundaland and to the eastern shores of the Mediterranean Sea. In addition, the names *Barek* and *Shama* show a relatively clear migration path from India to the Near East (p. 178). This means that the name set provides tentative evidence of the India→Phoenicia migrations.

Mitanni: The calculated urheimat of this name set is Extended India with the Total Reliability of 6+2 (reliable), and the region of second highest appearance is Middle East. In addition, the names *Kirta* and *Shatti* show a migration path from India to the Mitanni lands in the Near East (p. 178), which

means that the name set provides tentative or moderate support for India→Phoenicia migrations.

Indo-Asiatic: The calculated urheimat of this name set is Extended India with the Total Reliability of 6+1 (reliable). The appearance of the names declines systematically when advancing away from India towards Near East and Europe via Gedrosia. In addition, the name *Asia* appears as a place name in Lebanon, Cyprus, and Italy, which suggests migrations from India or Bangladesh to these locations, as *Asia* is most common in Bangladesh. The forename *Assam* seems to have migrated from India to Israel via Arabia (p. 172). In total, the Indo-Asiatic names provide at least tentative support for the India→Phoenicia migrations.

In total, the Phoenician, Mitanni, and Indo-Asiatic name sets provided *tentative or moderate* evidence for the India→Phoenicia migrations. When this is summed up with the *tentative* evidence of chapter 4.6 (p. 134), the total evidence remains *tentative*. Additional weaker support for the hypothesis is presented in Appendix table 62.

According to the India → Mediterranean → British Isles hypothesis, *there was some migration from the Indian Subcontinent to the British Isles via the Mediterranean Sea 3000–50 BCE*. Although the names study provided tentative or moderate support for the India→Phoenicia hypothesis, it provided only *weak* support for the migrations from India to the British Isles via the Mediterranean Sea. None of the name sets fulfilled anything more than criteria 3, meaning the tentative migration paths of name families. The name sets and name families that provided this weaker support for the India→Mediterranean→British Isles migrations are listed in Table 48 below.

Table 48: Individual name families as additional evidence for the India→Mediterranean→ British Isles migrations

Name set	Evidence
Legendary Irish	<i>Dannan</i> might have migrated from the Indian Subcontinent to the British Isles via the Near East and Italy/France (p.198).
Etruscan	<i>Easun</i> has its urheimat in India, and is densest in Monaco (p. 192). The Indian urheimat of the Etruscan name set suggests a potential connection from India to Italy via the Middle East. Yet, the geographic distribution of the Etruscan names suggests a migration route from India to Etruria around Africa.
Indigeteian	The Tichi* name family may have migrated from India to Carthage via Caucasus and the Black Sea (p. 189). However, migration around Africa is also possible.
Potentially Atlantean	<i>Atlant/Atlanti/Atlantis</i> might have migrated from India and Pakistan to France and England via the Near East.
Mitanni	<i>Shatti/Shatta</i> name family shows a tentative migration path from India to Tunisia via the Middle East (p. 178).
Hyksos	<i>Chaya/Chayan/Chayani</i> appears frequently in the Middle East as a place name, but is also a place name in the Balkans and Iberia (p. 180).
Kushite	<i>Kashta</i> appears densely in India, Egypt, and Albania (p. 181)
Legendary Catalan	<i>Morar</i> could have migrated to from India to the British Isles via the Balkans (p. 191).
Gadeir* name family	<i>Gadeir*</i> seems to have migrated from India and Pakistan to the Near East via the Red Sea (p. 200).
Indo-Asiatic	<i>Asia</i> appears as a place name in Lebanon, Cyprus, and Italy. <i>Indra</i> appears as a place name in Caucasus, and densely as an anthroponym in Switzerland (p. 172).
Ethiopian	<i>Amara/Amari</i> could have migrated from India to the Near East and the Balkans via Euphrates. (p. 179).
Ancient West African	<i>Magi</i> may have migrated from India to Italy via Arabia and Egypt (p. 184), although the route around Africa is more likely due to the high appearance of this name in West Africa.

When this *weak* evidence is summed up with the *tentative* evidence that was presented in chapter 4 (p. 142) the total evidence for the India→Mediterranean→British Isles hypothesis can be reduced to *weak*. Yet, some additional studies concerning the names Khatti/Katti/Catti, Ariyo/Arri, and Bharat/ Barat/ Parat/ Prt/Prwt could reveal more evidence in support of this route (see 4.8).

Onomastic evidence for the Indian Hyksos hypothesis

According to this hypothesis, *the Hyksos conquerors of Lower Egypt (1638 BCE) were Indian, Middle Eastern or East African successors of the Indus Valley civilization*. The names study revealed moderate evidence for the Indian origin of the culture of the Hyksos, as the calculated urheimat of the Hyksos names is Extended India with a reliability score 7+2. When this *moderate* evidence is combined with the *weak or tentative* evidence presented in chapter 4.11, the total evidence can Indian Hyksos hypothesis remains *weak or tentative*.

Onomastic evidence for the Indian migrations to Central Africa, Chad, and Nigeria

According to this hypothesis, *Indians colonized Chad ~3000 BCE and brought along their*

knowledge of metallurgy, which led to the invention of iron (p. 129). The names study revealed tentative evidence to support the migrations from India to Nigeria via Chad and Central Africa. The hypothesis, however, claims very early migrations and therefore, the evidence offered by the names study was downgraded to *weak or tentative*. The strongest evidence comes from the name set of the Ancient West African names as it had its assumed urheimat in West Africa, its calculated urheimat in Extended India, and the next highest appearance in West Africa. In addition, some Ancient West African names showed a tentative migration path from India to Nigeria via Central Africa and/or Chad. The Berber and Libu, Sea People, and Indigetea name sets offered additional support for the Atlantian metallurgy in Chad hypothesis, as Central Africa and Chad were along the migration paths that these name sets indicated. The summary of supporting evidence for the India→Central Africa migrations is shown in Table 49 below. Additional weaker evidence has been presented in Appendix table 66. When this *weak or tentative* evidence is combined with the *weak or tentative* evidence presented in chapter 4.6 (p. 129), the total evidence for the Atlantian metallurgy in Chad hypothesis remains *weak or tentative*.

Table 49: Name sets as evidence for the India – Central Africa – Chad migrations 3000 – 2500 BCE

Name set	Urheimat (reliability)	Second highest appearance	Names that indicate migration from India to Nigeria via Central Africa and Chad	Total names evidence
Ancient West African	Ext. India (5+1)	<u>West Africa</u> & East Africa	<i>Garama</i> , <i>Barisa</i> , and <i>Magi</i> show a tentative migration path from India to Nigeria via Uganda and Chad (see p. 184)	Weak or tentative
Sea People	Ext. India (6+1)	<u>West Africa</u> & South Africa	<i>Lukka</i> , <i>Dan(o)una</i> , and <i>Teres(h)</i> show a tentative migration path from India to West Africa via East Africa, although migrations via South Africa are also possible (p. 186).	Weak or tentative
Berber and Libu	Ext. India (5.5+2)	Sundaland & Bell Beaker Europe	<i>Atala</i> seems to have migrated from India to West Africa via East Africa and Chad (see p. 187)	Weak
Indigetea	Ext. India (3+2)	Bell Beaker Europe	<i>Indica/Indika</i> seems to have migrated from India to Nigeria via East and Central Africa, although migration around Africa is also possible (p. 189)	Weak
Total				Weak or tentative

5.14 Summary, conclusions, and suggestions for further studies

According to the India–Africa–Europe theory, *long distance migrations via waterways occurred at various occasions and during various periods 3000–200 BCE* (see p. 97). The purpose of the names study was to test (or evaluate) this theory and related migration route specific hypotheses. In addition, the match of the research data with two null hypotheses was evaluated. The testing and evaluation of the hypotheses was done based on research data that was obtained from the Mapcarta.com database of current and ancient place names, and from the Forebear.ie database, which

contains data of the geographic distribution of anthroponyms in all parts of the world. The urheimats of the name sets were calculated based on six indicators and based on Weighted Least Cost Analysis (see p. 64).

The calculated urheimats were presented with a Total Reliability score: If the Total Reliability was at least 7, the urheimat conclusion was considered reliable and if it was 6, the region was considered a good candidate for urheimat (see p. 165–166). The results of the study have been first presented in full in Table 35 (p. 132), and are summarized to Table 50 below.

Table 50: The likely urheimats of the 25 name sets that were covered by the study

Name set	Generally assumed origin	Detected urheimat	WUI	Weighted LCA	Total Reliability
Inuit (p. 171)	North America	Sundaland or North America	3	-	3
Kalevalan (p. 194)	Corded Ware Europe	Corded W. Europe	8	+2	10
Norse Gods (p. 194)	Corded Ware Europe	Corded W. Europe	8	-	8
Traditional Greek (p. 169)	Balkans & Crete	Balkans & Crete	8	+2	10
Legendary Irish (p. 197)	Bell Beaker Europe	Bell Beaker Europe	8	-	8
Catalan (p. 190)	Bell Beaker Europe	Bell Beaker Europe	4	-	4
Legendary African (p. 185)	Africa (varies)	Central and South Africa	6	+2	8
Fulani (p. 183)	West Africa	West Africa	8	+2	10
Archeological West African (p. 182)	West Africa	West Africa	8	+2	10
Kushite (p. 181)	East Africa	Extended India	6	+1	7
Ethiopian (p. 179)	East Africa	Extended India	4	-	4
Ancient West African (p. 184)	West Africa	Extended India	5	+1	6
Berber and Libu (p. 186)	Maghreb	Extended India	5.5	+2	7.5
Mitanni (p. 178)	Middle East	Extended India	6	+2	8
Hyksos (p. 180)	Middle East	Extended India	7	+2	9
Gadeir* name family (p. 199)	Mediterranean region	Extended India	6	-	6
Phoenician (p. 176)	Middle East	Extended India	5	+1	6
Indo-Asiatic (p. 172)	Extended India	Extended India	6	+2	8
Legendary Indian (p. 173)	India	Balkans & Crete	4	-	4
Druidic (p. 196)	Bell Beaker Europe	Extended India	4	-	4
Iberian (p. 188)	Bell Beaker Europe	Extended India	5.5	+2	7.5
Sea Peoples (p. 186)	Mediterranean	Extended India	6	+1	7
Etruscan (p. 191)	Mediterranean	Extended India	5	+2	7
Indigeteian (p. 189)	Bell Beaker Europe	Extended India	3	+2	5
Euhemerian (p. 175)	Imagination	Extended India	6	+2	8
Potentially Atlantean (p. 201)	Imagination	Extended India	3	+2	5

The results provide some support for the ancient migrations of Indians towards Western Europe via Sub-Saharan Africa. The migration route from India to Western Europe along the coasts of southern Africa is supported especially by the distribution of the Etruscan names, which have their highest appearance in India, second highest in Southeastern Asia, third highest in Western Africa and Southern Africa, and lowest appearance in Europe (see p. 192). In addition, several other name sets that had their calculated urheimat in Extended India illustrated tentative migration paths around Africa. These name sets include Ethiopian (p. 179), Ancient West African (p. 184), Hyksos (p. 180), Phoenician (p. 176), Indo-Asiatic (p. 172), Iberian (p. 188), Sea People (p. 186), and Indigetean (p. 189) name sets. In addition, the names study provided support for the India–Africa–Europe theory, according to which *long distance migrations via waterways occurred at various occasions and during various periods 3000–200 BCE*.

The detailed connections from India towards Western and Northern Europe were analyzed separately for each region, based on a set of 11 hypotheses. Table 51 (p. 214) shows the strength of the original genetic, archaeological, linguistic, and historical evidence, which was presented in chapter 4 and then sums it up with the new evidence that was found in the names study. The strength of evidence obtained from the names study had a close match with the strength of evidence obtained from the cross-scientific pre-study. This means that the methodology of the names study was nothing revolutionary and the results were not contradictory to the genetic, archaeological, linguistic, and historical evidence. In addition, the results of the name study were not used for actively increasing the credibility of the India-Africa-Europe theory – they were used for reducing the credibility of those hypotheses that did not receive support from the names study. Based on that, the potential methodological weaknesses of the study did not cause a notable risk of false conclusions at the level of these 11 hypotheses.

Rejection of the null hypotheses

In addition to evaluating the match of the research data with the hypotheses of the India–Africa–Europe theory, the study intended to evaluate also two null hypotheses:

Null hypothesis 1: *The Variation Rules, which are shown in Table 20, are invalid.* This hypothesis means that the variants in the created name families would not have had a genealogical connection to the original focal name from which they were generated. As there would not have been a genealogical connection, the different variants would have appeared relatively randomly in various unconnected regions of the world. This null hypothesis seems incorrect, as most names that were generated from the original focal names appeared most frequently in the same area as the focal names. In some cases, they appeared in other regions that were easily reachable from the urheimat by waterways. This was especially clear for the variants that had been generated by changes between those IPA characters that had been identified as Close Peers (see p. 49). In most cases, the dense locations of the names outside their urheimat matched with archaeological or historical evidence concerning the migrations from the urheimat to the target location. In addition, most of the connected locations have been likely targets of migrations from India based on the evidence given in chapter 4. The proper rejection of the null hypothesis 1, however, would require statistical tests in which the discovered geographic distributions of the name families would be compared to a random distribution.

Null hypothesis 2: *Short names of 2–5 letters tend to appear randomly all around the world, as they are so easily invented independently in parallel in various regions (chance resemblance, see p. 27).* This hypothesis received support for the 2–4 letter names, but only weak support for the five letter names, which tended to have a relatively similar geographic distribution as the longer names of the name set. This is revealed by the fact that in most name sets, the order of the top three regions of highest appearance did not change, even if the five letter names were included in the sample (see the

tables at p. 234, 237, 238, 240, 242, 245, 248, 250, 255, 258, 260, 264, 270, and 273).

Conclusions

The names study did not result in the clear falsification of any of the hypotheses. However, the

credibility of hypotheses 1 and 8 was reduced, as the discovered onomastic evidence was not as strong as the genetic, archaeological, linguistic, and historical evidence that had been presented in chapter 4.

Table 51: Evidence for the core hypotheses of the India–Africa–Europe theory

#	Hypothesis	Strength of the original evidence	Evidence of migration from the names study	Total evidence
1	India → East Africa hypothesis: <i>there were several migration waves from India to East Africa 3300–500 BCE</i> (p. 109).	Moderate or strong (p. 114)	Moderate (or strong) p. 203	Moderate (or strong)
2	India → West Africa hypothesis: <i>Indians founded a colony into tropical West Africa 3000–2500 BCE or 1550–100 BCE.</i> (p. 126).	Moderate (or tentative) p. 126	Moderate (p. 204)	Moderate (or tentative)
3	India → Maghreb hypothesis: <i>Indian migrants arrived to Mauritania and Maghreb 1550–200 BCE via the route around Africa</i> (p. 127).	Tentative (p. 127)	Tentative (p. 205)	Tentative
4	India → Africa → Western Europe hypothesis: <i>a large group of Dravidian speakers sailed to West Africa at some point of time 1500–500 BCE and to Western Europe 1500–200 BCE</i> (p. 115).	Tentative (or moderate) (p. 128)	Tentative or moderate (p. 207)	Tentative (or moderate)
5	India → British Isles hypothesis: <i>notable amounts of migrants from the Indian Subcontinent arrived at the British Isles 3000–50 BCE</i> (p. 129).	Tentative (or weak) p. 132	Tentative (or weak) p. 207	Tentative (or weak)
6	India → Phoenicia hypothesis: <i>the Phoenicians received a part of their culture and genes from the Indian Subcontinent</i> (p. 133).	Tentative (p. 134)	Tentative or moderate (p. 209)	Tentative
7	India → Mediterranean → British Isles hypothesis: <i>there was some migration from the Indian Subcontinent to the British Isles via the Mediterranean Sea 3000–50 BCE</i> (p. 134).	Tentative (p. 142)	Weak (p. 209)	Weak
8	Baltic → Caspian → Indus hypothesis: <i>people from the Baltic region migrated to the Indus Valley 5200–200 BCE via eastern river routes.</i> (p. 143).	Tentative or moderate (p. 145)	Tentative (or moderate) p. 207	Tentative (or moderate)
9	Indus → Caspian → North Sea hypothesis: <i>people from the Baltic region migrated to the Indus Valley 5200–200 BCE via eastern river routes</i> (p. 145).	Weak or tentative (p. 147)	Weak or tentative (p. 209)	Weak or tentative
10	Indian Hyksos hypothesis: <i>the Hyksos conquerors of Lower Egypt (1638 BCE) were Indian, Middle Eastern or East African successors of the Indus Valley civilization</i> (p. 148).	Weak or tentative (p. 148)	Moderate (p. 211)	Weak or tentative
11	Atlantian metallurgy in Chad hypothesis: <i>Indians colonized the shores of Lake Chad ~3000 BCE and brought along their knowledge of metallurgy, which led to the invention of iron</i> (p. 149).	Weak or tentative (p. 153)	Weak or tentative (p. 211)	Weak or tentative

Alternative explanations

The results of the name study match well with the original evidence that was presented in chapter 4, indicating the migration of Indian names towards Western Europe via the migration corridor that passes around the Cape of Good Hope and via West Africa. Yet, it is possible that some findings of the names study are exaggerated or have been biased by migrations and events that occurred between prehistoric times and now. Based on the need to challenge the India–Africa–Europe theory and the results of the names study, some alternative interpretations of the research data are evaluated below.

European colonialism: It is possible that the wide appearance of Indian or seemingly Indian names in Africa and Western Europe is partly caused by these names being actually Western European names, which would have spread to Africa and Asia along with European colonialists. This could explain, for example, why some Catalan, Druidic, and Legendary Irish names are more common in India or Africa than they are in Europe. This argument, however, does not apply very well to Old Norse and Kalevalan names, as people from the Nordic countries did not found colonies to Africa or southern Asia to the same extent as people from the Western European countries did during 18th – 20th century. In addition, it does not explain the high appearance of Indian names in Africa, Middle East, and the Northern Europe, or the appearance of presumably African names in India and South-eastern Asia. It also does not provide a good explanation to the approximately 70 traditional English surnames, which have a Dravidian origin according to Wikipedia (see chapter 4.6 and [Hawkins 1965, 28](#)) or to the maps that indicate the migration of the Dravid* name family from India to Western Europe around Africa (p. 117).

Slavery during the 1st and 2nd millennium CE: Some of the similarities of the Indian and African naming cultures can be explained by the exportation of African slaves to India during the 16th – 18th century CE, and by the migration of Indian slaves and indentured workers to Africa since the 17th century. Slave trade and the exploitation of labor,

however, caused migration mostly between India and East Africa, and there is no evidence of slave trade between India and West Africa. Therefore, the high appearance of Indian names in West Africa is more likely caused by voluntary Indian migrations.

Out of East Africa: According to this interpretation, the similarity of West African and Indian names is caused by migrations from East Africa to India and to West Africa. This explanation receives some support from the migration of African genes to the Indus Valley ~3000 BCE and by the migration of African sorghum millet to India ~2500 BCE. In addition, it is supported by the existence of African-looking people at the Andaman Islands near the Bay of Bengal. Yet, this phenotypic similarity could also be caused by a counter-current of migration: Based on genetic, archaeological, and historical evidence the main current of migration after year 3300 BCE would have been directed from India towards Africa.

Attraction of the Western Europe during the modern times: In some cases, the appearance of ancient Indian or African names in Western Europe can be explained by modern migration of Africans and Asians. These migrations tend to be directed to England, France, and Germany, which are generally considered attractive target destinations, or to Spain, Italy, and Greece, which are generally considered as necessary stepping-stones on the way towards England, France, and Germany. These modern migrations, however, do not properly explain the appearance of ancient Indian, African, Middle Eastern, and Nordic names in the more remote locations of Western Europe such as Ireland and Scotland, which have not been the favorite locations of modern time migrants who wished to migrate to the British Isles. This means that the Indian names that appear more frequently in Ireland, Scotland, and Wales than in England would have probably migrated to Ireland and Britain during the more ancient times.

Differences in longevity: According to this argument, the Iberian, Etruscan, and Sea People names, which had their calculated urheimat in India in this study, would have been originally most common at Western Europe. In a similar fashion, the

Phoenician and Hyksos names, which have their calculated urheimat in India, would have been originally Middle Eastern names. According to the longevity argument, these European and Middle Eastern names would have been carried to India and Africa partly by the conquests of Alexander the Great and by the Romans. According to this argumentation line, the European and Middle Eastern names would have become uncommon in Europe and in the Middle East for the following reasons:

1. Europe went through a period of Latinization during the Roman Empire, reducing the appearance of the more ancient regional names that could have been connected with ethnic nationalism, which would have posed a threat to the empire.
2. Europe, North Africa, and the Middle East were theaters for strong monotheist movements, which treated old myths and ancient pagan names with suspicion. These movements reduced the frequency of ancient names, and replaced them with names that had a positive monotheist connotation.
3. Since the Age of Enlightenment, European cultures have emphasized rationality, science, utilitarianism, and modernity in a fashion that reduced the popularity and frequency of ancient names, and promoted the rapid adoption of names that sounded more modern. This reduced the longevity and frequency of the ancient names in Europe. In places like India, Sundaland and Sub-Saharan Africa, old traditions and names have been tolerated largely, meaning that ancient names have not been replaced with newer ones as effectively as in Europe.

These processes, which reduced the longevity of ancient names in Europe and northern Africa, may create an illusion that almost all ancient names originate from India and Asia. Although this interpretation contains a feasible chain of reasoning, it ignores several name sets, which did not have a historical connection to Europe and which were not especially common in the Roman Empire, Middle

East, or in western and southern Europe. Yet, these name sets indicate potential migration paths from India towards West Africa, Maghreb, Western Europe, or Northern Europe. These name sets include the Indo-Asiatic, Ethiopian, Kushite, West African, Fulani, Old Norse, and Kalevalan name sets. The geographic distribution of these names does not match with the idea that prehistoric and ancient migrations and the diffusion of ideas would have been directed mostly outwards from the Mediterranean region. In addition, the *difference in longevity* argument ignores the evidence that was presented in chapter 4 in support of the India–Africa–Europe theory. It is a good, alternative explanation for the geographic distribution of some name sets, but not an explanation that would falsify the hypotheses and the evidence given in chapter 4.

Sundaland→Europe hypothesis: This is a new speculative hypothesis, which was revealed at a late stage of the study as a potential challenger of the India →Africa→ Western Europe hypothesis. According to the Sundaland→Europe hypothesis, *migrants from Sundaland arrived to Africa and Europe 3000–500 BCE along a maritime route either via southern India or directly over the Indian Ocean*. These migrations would explain why many ancient European names have their highest appearance in Sundaland. The reason would be that these names were originally Southeast Asian names. This interpretation receives tentative support from Das (2018), according to whom “*Many human and place names in Europe show similarity with austric Mundari words*”.

The studied names and name sets that support the Sundaland→Europe hypothesis have been summarized to Table 52 (p. 217). This *weak or tentative* evidence is supported by some genetic evidence. According to Brucato et al. (2019), Madagascar was inhabited by migrants who arrived directly from Indonesia. This study leaves the migration date open, and suggests that any prehistoric or historic date could be equally valid. Based on Wichmann (2023), the Austronesian languages had a relatively high diffusion speed already around 3000 BCE. This suggests maritime migrations, and gives indirect evidence concerning

the migrations from Sundaland to Madagascar around 3000 BCE, which matches with the time when Asian bananas appeared in Uganda. The people of Madagascar speak an Austronesian language and cultivate Asian coconuts. However,

no evidence concerning the genetic or linguistic connection between Sundaland and Western Europe was found in the pre-study (chapter 4). Due to this, the total evidence for the Sundaland–Europe hypothesis seems to be only *weak or tentative*.

Table 52: Name sets as evidence for the Sundaland–Europe hypothesis

Name set	Urheimat (and reliability)	Names that support the migrations from Sundaland to Western Europe or to some intermediate point	Strength of evidence
Indigeteian	Sundaland (3+0)	<i>Ampurias, Empod, Juncar, Cinnia/Ciniana Deciana, Desiana, Desia Mandoni, and Samprok</i> have their highest appearance in Sundaland (p.189).	Weak or tentative
Old Norse	Cord Ware Europe (8+0)	<i>Aesir, Eostre, Forseti, Sandra, Hariasa, Nerthus, Mimir, and Fulla</i> have their highest appearance in Sundaland (p. 195).	Weak
Legendary Catalan	Bell Beaker Europe (4+0)	<i>Iberian, Atipa, Aspa, Japteth, Japteht, Cetubal, Tubal, Kesed, and Phantony</i> have their highest appearance in Sundaland (p. 191). In addition, the names <i>Bithynia, Phanaton, Fantony, Taari, Meshech, Atipa, and Aitore</i> have a relatively high density in Sundaland. The name <i>Tubal</i> appears also as a place name in Indonesia.	Weak
Berber and Libu	Ext. India (5.5+2)	<i>Kakat, Munatas, Karomama, Nimloti, Iserweret, and Ridha</i> have their highest appearance in Sundaland (p. 187). It is unlikely that European colonialists would have carried these names to Sundaland and some of the names are so long that chance resemblance is unlikely.	Weak
Iberian	Ext. India (5.5+2)	<i>Amaina, Bagaro, Edereta, Sakaris, Tarkun, Pudar, and Radin</i> have their highest appearance in Sundaland (p. 188). Out of these names <i>Amaina, Bagaro, Edereta, and Budar/Pudar</i> seem show a tentative migration path to Iberia.	Weak
Etruscan	Ext. India (5+2)	<i>Alichsan, Atlenta, Aturmin, Ermania, Prisis, Tyrrhen, Metua, Urphe, Menle, and Vilae</i> have their highest appearance in Sundaland (p. 192). The names are so long that they cannot have been invented in parallel in Sundaland. However, it is possible that they were carried to Sundaland by Spanish or Portuguese colonialists.	Weak
Hyksos	Ext. India (7+2)	<i>Sakir</i> and <i>Har</i> could be originally Austronesian names that spread to Africa directly or along with some Indian migrants (p. 180).	Weak
Kalevalan	CW Europe (8+2)	<i>Tuira, Niera, Tuuri, and Tellerva</i> have their highest appearance in Sundaland (see p. 194 and Appendix table 58). It is unlikely that European colonialists would have carried these names to Sundaland. However, it is possible that these names migrated first from Nordic and Baltic countries to India and from there to Sundaland. It is less likely that they would have migrated to Finland from Sundaland.	Weak
Legendary Irish	Bell Beaker Europe (8+0)	<i>Aranan, Kolpa, Danan, Greine, Tuatha, Heremona, Milesiam, and Ir</i> have their highest appearance in Sundaland (p. 198). This, however, can be explained possibly by European colonialism, although the Irish were not active as colonialists as the English were.	Weak
Total evidence			Weak or tentative

Methodological challenges and improvement suggestions

The study of the name sets was used only as additional evidence, and it did not play a central role as proof for the India–Africa–Europe theory. Therefore, the potential methodological challenges of the names study do not ruin the foundation of evidence for the India–Africa–Europe theory. Yet, the following challenges should be taken into account in future studies:

Formulation of geographic regions: The reliability of results would improve, if the geographic scope of the study were to be divided into regions of roughly equal population, for example, dividing India and China to lower level regions, and joining regions of small population size in order to form larger regions (e.g. combining *Balkans and Crete* with the *Kurgan Europe*). In the current study, the problem of the high population of India was tackled by using also indicators, in which the appearance of the names was divided by population size. This indicator, for example, made it possible to confirm *Balkans* as the likely urheimat of the Traditional Greek names.

Sampling: In this study, some name sets such as the Ancient West African names were constructed by joining two sources (e.g. al Idrisi and Pliny the Elder). In future studies, it is not recommended to combine to each other name sets that are based on different sources, unless the stories have originated clearly from the same, specific geographic region. In addition, names that are globally famous and have a positive connotation (e.g. *Heracles*) should not be added to the samples without special reasons, as these names would have spread all over the world during the modern times based on their popularity, making it impossible to deduce their urheimat from the research data.

Generation of variants: In this study, the generation of variants from the original focal names was not systematic enough. Although the main principle for the generation of variants was that only variants with the maximum Variant Distance of two variation steps from the original focal name would be accepted, the variation rules and the definition of distances evolved during the study. This led to a

situation, in which some variants, which would have fitted within the Variant Distance of two, were not always identified for all of the focal names. In future studies, the Variation Rules should be defined upfront, and the maximum Variant Distance should be clearly specified for each name set. In addition, it would be useful to create an algorithm for finding all the variants, as the non-automated generation of variants is prone to errors.

Weighting of variants: In this study, a dozen of variants were identified for some focal names whereas in some cases only a couple of variants were identified. This could lead to biased name sets in which a name family that contains many variants gets more weight than small name families. In future studies, this problem should be prevented by giving all name families the weight of one, and then dividing the weight of each variant by the $N_V + 1$, in which N_V is the amount of generated variants. In this study, the problem of giving too much weight to some names was handled in most name sets by limiting the amount of variants to just a couple variants, especially in the bigger name sets.

Determination of mode values at a regional level: In this study, the mode values for the incidence of anthroponyms were determined usually at the level of countries. The focus on countries could lead to situations, in which India is determined as the mode value (mode location) for a specific anthroponym, although half a dozen of small countries together would indicate a mode region, in which that anthroponym is more common than in India. Such a situation seemed very rare in the research data. However, in future studies, all mode values should be determined at a regional level, if available data allows. In this study, the grouping of countries to regions was done only in those cases in which several countries had the same incidence of a specific name. For example, if an anthroponym appeared once in Nigeria, once in Niger, and once in India, its mode region was interpreted as West Africa.

Limitation of the effect of small instances: In this study, the mode regions (countries) sometimes contained just a couple of anthroponyms whereas in some cases, the mode region (country) contained

tens of thousands of anthroponyms. In order to limit the weight of small mode values, small instances of anthroponyms could be given lower weight than large amounts of instances. Yet, in archaeology, the discovery of a hoard that contains one Roman coin acts as equally important evidence as the discovery of a hoard that contains twenty Roman coins. In genetics, the discovery of one ancient genome that contains a specific haplogroup is almost equally valuable as the discovery of twenty instances of this haplogroup in ancient genomes. According to the DH theory, coins, haplogroups, and names are replicators, and replicators are unlikely to be randomly born if they are complex enough (see p. 27).

Division to long and short names: In this study, the division of names to long and short was based on the amount of (Latin) letters that the names had. A more accurate method would be the calculation of syllables or sounds. The division of words to syllables, however, would require knowledge of the language to which the word belongs. This is not possible for opaque names, as their meaning and cultural origin is highly uncertain. Therefore, an alternative would be to calculate the amount of sounds. Here, again, the cultural background of a name affects, how the sounds of the name should be transcribed into Latin letters. Yet, it is possible that the way of writing names in Latin letters is not very dependent on the name of the culture, as the transcription is often done by some international specialist or by some person who is intending to do the transcription according to European principles. Therefore, the Latin letters can be interpreted as phonetic writing in many cases. In this study, the amount of letters was used as a measure due to its simplicity. This is in line with Holman et al. (2011) who achieved very good results with very simple rules.

Migration: In future studies, more weight could be given to those cases in which the gender of an anthroponym stays the same. For example, the Indian name *Agastya* is gendered as a female name. It appears as its variant *Agastia* in India, Indonesia, and South Africa. However, only in India and South Africa it is gendered as a female name. This means

that the migration of the name from India to South Africa may be even more likely than its migration to Indonesia.

Summing up evidence: There is a need for additional analysis concerning the ways, in which archaeological, genetic, linguistic, cultural, mythological, and onomastic evidence can be summed up. For example, there should be cross-scientific guidelines for counting together archaeological, genetic, historical, linguistic, and onomastic evidence. The question of the usage of names studies as evidence of connections and migrations was solved in this chapter in such a fashion that the name sets were seen as sufficient evidence for the occurrence of migrations whereas the dating of these migrations was estimated based on archaeological, genetic, and historical data.

Revision of paradigms: There are two opposing manners for interpreting the research data of chapter 4 and 5. These manners seem to be somewhat rigid and incompatible, which means that they can be perceived as scientific paradigms. In the terminology of the DH theory, they should be described as memplexes.

According to the Eurocentric, positivist, cultural evolutionist, and slightly colonialist memplex, all great cultural things diffused outwards from the region that consists of the coasts of the Mediterranean Sea and the Middle East. Areas like India, Africa, and Karelia were periphery, and after the collapse of the Indus Valley civilization, they were uncivilized periphery. Based on the ideas of cultural evolutionism, the European states of the late Medieval Ages must have been more advanced than the Bronze Age civilizations. This leads to the conclusion that if common people of the medieval times did not migrate long distances, then the Bronze Age people must have migrated even less. This all leads to the conclusion that Bronze Age and Iron Age people did not migrate much, and if they migrated, they must have been Romans, Greeks, or Phoenicians (because these people belonged to the superior cultures of the world). Based on this line of thinking, all academic scholars who discover evidence concerning long distance migrations that would have occurred during the Bronze Age or Iron

Age without Roman, Greek, or Phoenician agency, must be pseudoscientists, amateurs, or fanatic Indian or African nationalist. Based on this reasoning, the observations and findings of African and Indian linguists can be ignored, especially if they have not been published in peer reviewed journals (monographs do not serve as evidence).

The colonialism of this paradigm is augmented by the rigid application of comparative linguistics with the assumption that words can only walk, they do not sail. In addition, colonialism is connected to the attitude, according to which language trees and descent of words are interesting whereas loan words are a nuisance that harms the construction of nice language trees. Based on these assumptions and attitudes, it is possible to conclude that the lexical similarities between Dravidian languages, Wolof, Mande, and Basque languages would be caused by chance resemblance, or by badly performed cognate studies. The *positivist* side of this Eurocentric-Positivist-Colonialist paradigm is the only positive element of this paradigm. It can be used for the production of hypotheses (also speculative ones) and for the testing of these hypotheses. Yet, the risk of excessive positivism is that large amounts of weak and tentative data cannot be handled properly. Instead of summing up a large body of coherent cross-scientific body of evidence into tentative or moderate evidence, the extreme positivists tend to consider weaker pieces of evidence as garbage that may pollute also the stronger pieces of evidence.

An alternative to this Eurocentric-Positivist-Colonialist paradigm is offered by anti-colonialist archaeology and linguistics, post-processual archaeology, and usage-based linguistics. According to this paradigm, Europe and Middle East were not the only locations of advanced Bronze Age and early Iron Age civilizations. This means that some advanced Asian civilizations such as the Austronesians may have greatly influenced very distant regions, such as Madagascar. In addition, great innovations such as iron metallurgy may have been invented in Africa or India 3000 – 2500 BCE. Oldest pyramids may have been built in Indonesia, and oldest fortresses may have been built in Siberia. After distancing from the ideology of colonialism, it

is also possible to see that Europeans were not the first ones to sail around the Cape of Good Hope: The Phoenicians circumnavigated Africa ~600 BCE, followed by Persians ~350 BCE. This also makes it easier to take distance to cultural evolutionism, according to which the Phoenicians could not have migrated around Africa 600 BCE, as they belonged to an inferior culture compared to the Portuguese explorers and Spanish conquistadors.

After the denunciation of the colonialist memplex, it is possible to notice that Africans, Indians, and Southeast Asians have their right to rewrite the history with their novel interpretations of research data. According to post-processual archaeology, archaeological evidence (and genetic, linguistic, and historical evidence) is a discourse that can be interpreted in more than one manner. Due to this, academic scholars can use also weaker evidence as material for their narratives, even if stronger pieces of evidence should form the foundation. This means that evidence should not be rejected merely because it is old or has been published by a person who seems to have ethnic or nationalist motives: Also, you and we as audience are influenced by ideological factors. What is important is to do self-reflection in order to recognize the effect of ideologies and ideological memplexes to academic research.

In the field of linguistics, the post-modern perspective and use based linguistics mean that languages, lexicons, anthroponyms, and toponyms should be seen as natural systems that do not necessary fit nice language trees. Languages and cultures may also absorb large amounts of loan words and loan names from other languages, and sometimes the donators of these loan words and names may come from very far-away places.

In this study, the research plan was made based on processual archaeology and with the positivist intent to form hypotheses and to test them. After the research data had been collected, the hypotheses and their supporting evidence from chapter 4 were compared to the results of the names study. In those cases, in which the names study did not support the hypothesis as well as the genetic, archaeological, linguistic, and historical data, the credibility of the

hypothesis was slightly reduced. This matches the idea of *testing* within the positivist paradigm. However, in those cases in which the results of the names study provided stronger evidence than what was provided in chapter 4, the total strength in

support of the hypothesis was slightly increased. This was done because the names study provided additional support to the hypotheses, which were interpreted as narratives that were based on the research data.

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6 Summary of contributions

This book advanced via three sections, which were *the Dawkins–Habermas theory* of cultural evolution (DH theory, chapter 1–3), the *India–Africa–Europe theory* concerning the migrations out of India (chapter 4), and an *empirical study* concerning the geographic distribution of 24 ancient name sets (chapter 5).

DH theory

The main contribution of the first chapters was to present the DH theory, which is a synthetic cross-scientific theory of cultural evolution based on the following scientific traditions:

1. The theory of Ideational Cognitive Archaeology (Huffman 1986) and Cognitive Processual Archaeology (Mithen 1999)
2. Practice theory, discourse analysis, and the theories concerning the transformation and reproduction of social structures (Bourdieu 1972, Habermas 1984, and Butler 1990)
3. Systems theory and chaos theory (e.g. Buckley 1967, Miller 1978, and Gleick 1987)
4. Memetics and the theory of archaeological viruses (Dawkins 1976, Cullen 2000)
5. The theory of evolutionary economics (Nelson & Winter 1982) and the population ecology of organizations (Aldrich & McKelvey 1983)
6. The biological theories of multi-layered natural selection (Gould 1982) and long-term evolution (Cooper 1984)
7. The use-based theory of the evolution of languages (Langacker 1987)

The DH theory intends to incorporate the best ideas from these theories by presenting them in a more general and cross-scientific manner. In addition, it intends to bring theory formulation to the level of quantitative measures and models, raising above the level of analogies and the qualitative interpretations of past cultural evolution. By driving towards this

objective, the DH theory extends and supersedes the ideas of Dawkins and Cullen.

According to the DH theory, cultural evolution is a process, in which *Interactors* such as persons, communities, organizations, professions, kingdoms, and civilizations develop, use, exchange, and mutate *replicators*, and carry them from generation to another, and from region to region. These replicators include genes, ecofacts, and memes, and the memes include artefact styles, customs, beliefs, discursive elements, motifs, symbols, names, words, and linguistic features.¹⁸² Cultural replicators appear also in the form of larger memplexes such as material cultures, industries, languages, discourses, stories, and religions. In some cases, a cultural replicator can simultaneously be perceived as a meme and as a memplex. A spoken word, for example, is a meme that can be replicated to another person, but at the same time, it is a memplex, which consists of syllables and sounds. Cultural replicators exist in a mental, material and performed form, and in the *etched* form, which means the representation of mental replicators into two-dimensional format. In addition, it is possible to define taxonomized replicators, which classify the phenotypes of cultural systems (e.g. “overgrazed landscape”). These phenotypic replicators, however, should not be considered essential to understanding cultural evolution, as they are usually caused by mental, material, or performative replicators, or are the output of genetic replicators (ecofacts) or attractors.

According to the DH theory, cultural evolution is caused by the mutations of memes and by the active variation of memes and memplexes by their *Carriers*, meaning the interactors that carry them. In the competition of the original memes and memplexes against their allele variants and versions, it is likely that *socio-cognitive selection* will favor those memes and memplexes that bring some subjectively evaluated benefit to their carrier. This benefit could be material, financial, social, or symbolic. Sometimes the socio-cognitive selection favors memes and memplexes that are harmful to

¹⁸² Grammatical, morphological, and phonetical features

their carrier or to their environment. In these cases, *natural selection* will take its effect by slowing down the growth of the carriers of harmful memes or by reducing their chances of survival. In addition, natural selection may root out those cultural replicators that cause the collapse of the ecosystem that maintains the interactors that carry the harmful memes.

According to the DH theory, the form and meaning of cultural replicators is likely to change due to mutations and due to intentional changes. Small changes are more likely than big changes and small changes are less likely to be *self-corrected* than larger changes (p. 35). Based on that, the evolution of artefacts, customs, beliefs, words, and names is best understood by focusing at the analysis of small changes and closely similar variants. The DH theory intends to offer quantitative tools for the measurement of the magnitude of these changes. One tool is the Similarity Percentage (chapter 2.2) and another tool consists of Variation Rules (chapter 2.3). In addition, the DH theory makes it easier for archaeologists to utilize linguistic tools such as *Improved Lexicostatistics* (3.4) and *Improved Glottochronology* (03.7). In a similar fashion, it helps the linguists to utilize the archaeological *diversity principle* in the study of the urheimats and migration paths of anthroponyms (p. 63). In addition, the DH theory intends to make use of some other methods that can be used for calculating the likely urheimat of genetic markers, artefact styles, or linguistic replicators (chapter 2.5).

The migration of cultural replicators is an important factor in cultural evolution as cultures that are capable of long distance travel are able to adopt beneficial memes from other cultures and to fertilize other cultures with their knowledge. This tends to speed up cultural evolution and to bring benefits to the tribes, kingdoms, and civilizations that engage in long-distance expeditions, long-distance migrations, and long-distance trade. Cultural evolution, however, is not a process that advances from simple and primitive systems to complex and advanced systems. Cultures may appear in introverted and interregional forms, and the more interregional cultures may revert to introverted local

cultures (chapter 1.8). In order to understand cultural evolution, it is useful to analyze the long distance migrations of replicators such as genes, haplogroups, ecofacts, artefact styles, technologies, words, names, and customs. In order to identify markers of migration, it is useful to focus on replicators that are complex enough. Examples of such memeplexes include complex customs and artefact styles, long words and names, and *ethnic sets* (chapter 2.4). On the other hand, it is useful to recognize the risks that appear when one intends to study the migration of entire languages or cultures, as languages and cultures may have more than one parent language or parent culture (chapter 2.6).

The purpose of the DH theory is not only to explain past cultural evolution. In addition, it intends to produce predictions that could be tested in laboratory conditions, as cultural evolution is a cognitive process, which occurs in a communication network that consists of regions and generations. This means that the presented quantitative models of cultural evolution can be improved and calibrated in empirical studies that may be performed in laboratory conditions (p. 56 and 86).

India–Africa–Europe theory

In chapter 4, human migrations between the Indian Subcontinent and Western Europe were studied based on the DH theory. The idea was to identify cultural replicators and genetic markers that would have appeared in identical or highly similar form in India and Western Europe. Critical measures were used to rule out chance resemblance when evaluating the strength of evidence. The study started with the analysis of the data of the Genetic Atlas of Human Admixture History (GAHAH). The first discovery was that there might have been migration from Eastern Afghanistan to Scotland 600–400 BCE, the aggregated range of confidence being 710–206 BCE. After the analysis of GAHAH data, the likeliest routes between Scotland and the Indus region were identified based on Least Cost Analysis, and the India-Africa-Europe theory was specified into the form of 1 main hypothesis and 11 complementary hypotheses concerning the potential routes. According to the main hypothesis, *long*

distance migrations via waterways occurred at various occasions and during various periods 3000–200 BCE. The next step was to perform a cross-scientific literature study in which genetic, archaeological, linguistic, cultural and historical evidence was collected in order to support or reject the hypotheses of the theory. The discovered evidence provided moderate or strong support for this main hypothesis of the theory in the form of the evidence that supported ancient migrations from India to East Africa and vice versa (p. 114) and ancient migrations from the Baltic region to the Indus region (p. 145).

The least costly route from the Indus region to Scotland would have been the Indus Valley → Red Sea → Mediterranean → North Sea route, assuming that the canal that connected the Nile with the Red Sea would have been operational. This canal was first built 1850 BCE and was operational still 1380 BCE (p. 102). It was then rebuilt at least 600 BCE, and was operational when Egypt and the Indus Valley belonged to the Achaemenid Empire, which occupied both the Indus Valley and Egypt 522–486 BCE. This period from 600 BCE to 486 BCE matches with the GAHAH data, according to which the migrations from the Indus region to Britain occurred most likely 600–400 BCE. However, the evidence to support this hypothesis was rated only as tentative (see Table 37, p. 142).

A more likely scenario concerning the migrations from the Indian Subcontinent to Western Europe is based on maritime migrations from India to East Africa 3200–1000 BCE, and to West Africa and Western Europe 1500–200 BCE. The evidence that supports the migration leg from India to East Africa was rated as *moderate or strong*, and the evidence concerning migrations from India to West Africa was rated *moderate (or tentative)*. The evidence in support of the India – Western Europe migrations was rated *tentative (or moderate)*. The evidence for the different hypotheses has been summarized into Table 41 (p. 158).

Study of 24 ancient name sets

In chapter 5, the hypotheses of the India–Africa–Europe theory were evaluated against the results of an onomastic study, in which the geographic distribution of 24 ancient name sets and 2 control sets was studied. This study provided some additional support for the India–Africa–Europe theory, while also reducing the credibility of two hypotheses out of 11. It revealed that the calculated *urheimat* of several presumably African and European name sets was located within the region of *Extended India* (Nepal, Sri Lanka, and India). These name sets included the Ethiopian, Ancient West African, Iberian, Etruscan, Berber & Libu, and the Sea People name sets (see 5.14). In most cases, the appearance figures of the Indian name sets declined rather systematically when advancing away from the Indian Subcontinent, measured by days of travel. Several name sets even showed potential migration paths from India to Maghreb and Western Europe around Africa (see p. 206). In addition, the study provided support for the Variation Rules that had been created for Improved Lexicostatistics (p. 86).

In the summary of chapter 5, the genetic, historical, linguistic, and archaeological evidence of chapter 4 was compared to the evidence obtained from the names study. If the names study did not support the hypotheses, the credibility of the hypothesis was reduced. This created a table, which summarizes the migration hypotheses of the India-Africa-Europe theory, and the strength of the supporting evidence for each hypothesis (p. 214).

Further studies

As the study presented evidence that relates to several unconventional hypotheses, it is necessary to conduct additional studies in order to confirm or reject the conclusions. Specific directions for further studies have been summarized at the end of each chapter of this book. In addition, it is possible to use the findings of chapter 4 and the research data of pages 228–284 as source material for new, complementary, and alternative interpretations.

Appendix A: Measurement of similarities

Appendix table 1: Different characterizations of *Atlas the Ancient Ruler*

#	Attributes of Atlas	Sanchuniathon	Homer	Hesiod	Plato	Diodorus Siculus
1	Is ancient	Very ancient	Extremely ancient	Extremely ancient	Extremely ancient	Very
2	Royal status	Prince	King or ruler	Noble or demigod	King	King
3	Relation to the sea	-	Ruler of an island	-	Ruler of an island	Ruler of a coastal kingdom
4	Sagacious	-	Possessor of fearsome information; knew the depth of all seas	-	-	Great astronomer
5	Human or god	Human	God and human at the same time	Superhuman	Human, but a son of a god	Human
6	Oldest of brothers	-	-	Not	Yes	Yes
7	Was punished	Thrown to a deep pit	-	Punished by Zeus	-	-
8	Parents	-	-	Iapetus & Clymene	Poseidon and Cleito	Titaea
9	Children	-	Two daughters		Many sons	Many sons and seven daughters
10	Interpretation of Titans	Shepherds of sheep	-	Divine beings	-	Children of Titaea
11	Connection to the sky	-	Holds the pillars that separate earth and sky	Holds the sky on his shoulders	-	Observes the sky as an astronomer

Appendix table 2: Migrations from the coasts of the Indian Ocean towards Scotland around Africa

Group	Origin of migration	Destination (and route)	Likeliest year (BCE)	Start of 95% confidence (BCE)	End of 95% confidence	Aggregated likeliest year (median, range, BCE)	Aggregated confidence range	Regional confidence range
1	Ethiopia, Kenya, South Africa	Morocco (via Indian Ocean and the Atlantic)	710	1914	326 CE	710	1914 BCE – 326 CE	1914 BCE – 326 CE
	Nigeria, Guinea							
	Ireland, UK, Sardinia							
2	UAE	Sicily (around the Cape of Good Hope)	654	6954	186 CE	654–430 BCE	6534 BCE – 214 CE	654 – 234 BCE
	Kenya							
	Nigeria, Guinea	Sicily (via the Atlantic Ocean)	430	6534	214 CE	598–402 BCE	710–38 BCE	
	Ireland, UK, Norway							
	Germany, Poland, Lithuania	South Italy (via the Atlantic Ocean)	234	2530	382 CE	2530 BCE – 382 CE		
	Guinea							
	Norway, Ireland, UK, Germany, Spain, Italy							
		South Italy						
3	Kalash (Afghanistan multiway)	Wales, Scotland, Lithuania	598	990	206 BCE	598–402 BCE	710–38 BCE	710–38 BCE
		Orkney Islands, Scotland, Ireland, Norway	402	710	38 BCE			710–38 BCE
4	Nigeria	Spain (via the Atlantic Ocean)	542	5666	410 CE	542–234 BCE	2530 BCE – 382 CE	
	Ireland, UK, Norway							
	France, Germany	Spain						
	Kenya, South Africa	Spain (via the Atlantic Ocean)	234	2530	382 CE			
	Ireland, UK, Norway							
	Lithuania, Finland							
		Germany, France	Spain					

Appendix table 3: Main routes from Jalalabad (Afghanistan) to Edinburgh (Scotland)

	Continental route	Eastern river route	Mediterranean route	Route around Africa
Leg 1	Jalalabad–Kerki 885 km (ground travel)	Jalalabad–Kerki 885 km (ground travel)	Jalalabad–Karachi 1693 km (rowing downstream)	Jalalabad–Karachi 1693 km (rowing downstream)
Leg 2	Kerki–Astrakhan 1200 km (rowing downstream Amu Darya and along the Caspian Sea)	Kerki–Astrakhan 1200 km (rowing downstream Amu Darya and along the Caspian Sea)	Karachi–Suez Port 5702 km (sailing)	Karachi–Mombasa 5067 km (sailing)
Leg 3	Astrakhan–Calais 3725 km (ground travel)	Astrakhan–Bulgar 1500 km (rowing upstream Volga)	Suez Port –Zagazig 158 km (rowing on a man-made canal)	Mombasa – Port Elizabeth 4311 km (sailing)
Leg 4	Calais–Edinburgh 859 km (sailing)	Bulgar–Veliky Dvor 1500 km (rowing upstream Volga and its tributaries)	Zagazig–Alexandria 180 km (rowing downstream)	Port Elizabeth – Sao Tome 2842 km (sailing)
Leg 5		Veliky Dvor–Vytegra 0.5 km (pulling boat across dry land)	Alexandria–Edinburgh 7480 km (sailing)	Sao Tome – Edinburgh 5304 km (sailing)
Leg 6		Sources of Vytegra to St. Petersburg 500 km (rowing downstream and along a lake)		
Leg 7		St. Petersburg – Edinburgh 2895 km (sailing)		
Total	6669 km	8,480 km	7,660 km	19,398 km

Appendix C: Onomastic research data

Appendix table 4: Classification of countries to regions

Continent	Region	Population (millions)	Area (km ²)	Countries
Africa	East Africa	374	6,823,045	Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania, Uganda
	West Africa (Sub-Saharan)	398	6,910,553	Burkina Faso, Cameroon, Chad, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mali, Niger, Nigeria, Sierra Leone, Togo
	Maghreb	119	6,248,195	Algeria, Canarias, Cap Verde, Libya, Mauritania, Morocco, Senegal, Tunisia, West Sahara
	Central and South Africa	270	13,679,627	Angola, Botswana, Central African Republic, Congo, DR Congo, Gabon, Lesotho, Malawi, Mayotte, Mozambique, Namibia, South Africa, Swaziland, Zambia, Zimbabwe
Americas	North America	N.A.	N.A.	North America and Greenland (prehistorically separated from Europe)
	South America	N.A.	N.A.	South America (prehistorically separated from Europe)
Asia	Middle East	369	6,168,150	Arabic countries, Armenia, Azerbaijan, Cyprus, Egypt, Georgia, Iraq, Israel, Lebanon, Palestine, Syria
	Central and Northern Asia	102	18,526,351	Asian part of Russia (excluding Caucasus), Kazakhstan, Kyrgyzstan, Mongolia, Turkmenistan, Uzbekistan
	Gedrosia	130	3,239,480	Afghanistan, Iran, Pakistan, Tajikistan
	Ext. India	1421	3,500,354	India, Maldives, Nepal, Sri Lanka
	Indochina	421	2,121,137	Bangladesh, Bhutan, Laos, Myanmar, Tibet, Thailand, Vietnam
	Sundaland	415	2,997,256	Indonesia, Malaysia, Papua New Guinea, Philippines, Micronesia, Melanesia
	Ext. China	1624	9,634,259	China, Hong Kong, Taiwan
	Japan & Korea	203	598,665	Japan, South Korea, North Korea
Australia and NZ	Australia and NZ	N.A.	N.A.	Australia and New Zealand
Europe	Bell Beaker Europe	416	2,768,321	Austria, Britain, Belgium, Czech Republic, France, Germany, Iberia, Ireland, Italy, Luxemburg, Netherlands, Slovakia, Slovenia, Switzerland
	Corded Ware Europe	165	5,392,282	Belarus, Denmark, Estonia, Iceland, Finland, Latvia, Lithuania, Norway, Poland, Russia (European part except for Caucasus), Sweden
	Kurgan Europe	101	1,494,165	Hungary, Romania, Russia (Southern Caucasian Federation and North Caucasian Federation), Ukraine
	Balkans	41	518,148	Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Kosovo, Montenegro, North Macedonia, Serbia

Appendix table 5: Implicit hypotheses concerning the urheimats and distributions of name sets

Name set	Assumed origin (implicit hypothesis)	Deduced geographic distribution based on null hypothesis 3	Assumed group (implicit hypothesis)
Traditional Greek	Greece	Greece, Mediterranean region, Coasts of the Black Sea and the Middle East	European names
Catalan	Northwestern coast of the Mediterranean Sea (possibly Near East)	Spain, France, and possibly the Near East	
Iberian	Iberia	Iberia	
Indigeteian	Iberia	Iberia	
Druidic	Western and Central Europe	Western and Central Europe	
Etruscan	Western Italy	Italy and possibly Corsica	
Legendary Irish names	Ireland (or some unknown part of Western Europe)		
Kalevalan	Finland and Karelia	Neighboring countries	
Norse Gods	Western and Northern Europe		
Mitanni	Middle East	Middle East	Middle Eastern and Mediterranean Names
Hyksos names	Middle East	Middle East (including Egypt)	
Phoenician	Near East	Near East and the Mediterranean region	
Sea People names	Central and Eastern Mediterranean (excluding Egypt)	Egypt	
Gadeirus name family	Mediterranean region & Southern Iberia	Mediterranean region & Southern Iberia	
Kushite	East Africa	Neighboring countries	African names
Ancient West African	West Africa	West Africa with some appearances in Maghreb and Central Africa	
Archaeological West African	West Africa	West Africa with some appearances in Maghreb and Central Africa	
Fulani	West Africa	West Africa with some appearances in Central or Eastern Africa	
Berber and Libu names	Maghreb and Libya	Maghreb, Libya, Egypt	
Ethiopian	East Africa	East Africa	
Legendary African	The location where the legend is told	Neighboring countries	
Indo-Asiatic	India	Neighboring regions	Asian names
Inuit	Eastern Siberia or North America	Eastern Siberia, North America, and Greenland + some appearances in Denmark and South America	Inuit names
First Rulers of the Indian Ocean	East Africa, Arabia, and India (or the imagination of storytellers)	East Africa, Arabia, India, and neighboring regions (or a random distribution as the names would have been invented)	Fictional names
Potentially Atlantean names	Atlantis (or the imagination of Plato)	Almost random distribution, as the names would have been invented	

Appendix table 6: The appearance of the Gadeirus name family in different geographical regions

	Name	India	West Africa	Sundaland	Gedrosia	Middle East	Maghreb	Bell Beaker Europe	Corded Ware Europe	East Africa	Kurgan Europe	Americas
Surnames	Gadeirus	-	-	-	-	-	-	-	-	-	-	-
	Gadeir	-	-	-	-	-	-	Mode	-	-	-	-
	Gadir	-	-	-	-	2nd	-	-	-	Mode	-	-
	Gadei	Mode	-	-	-	-	-	-	-	-	2nd	-
	Gadeia	-	-	-	-	-	-	-	-	-	-	Mode
	Gade	Mode	-	2nd	-	-	-	-	2nd	-	-	-
	Gdr	-	-	Mode	-	-	-	-	-	-	-	-
	Gadira	2nd	-	Mode	-	-	-	-	-	-	-	-
	Gadiri	-	-	-	2nd	-	Mode	-	-	-	-	-
	Gadeire	-	Mode	-	-	-	-	-	-	-	-	-
	Gadeiro	-	-	-	-	-	-	-	-	-	-	Mode
	Gadeiray	Mode	-	-	-	-	-	-	-	-	-	-
	Gadeiraya	Mode	-	-	-	-	-	-	-	-	-	-
	Gadeyrayasate	Mode	-	-	-	-	-	-	-	-	-	-
	Gateira	-	-	-	-	-	-	2nd	-	-	-	Mode
	Kadeir	Mode	-	Mode	-	-	Mode	-	-	-	-	Mode
	Kadir	2nd	-	Mode	-	-	-	-	-	-	-	-
	Kadei	-	Mode	-	2nd	-	-	-	-	-	-	-
	Kadeira	-	-	-	-	-	-	-	-	-	-	Mode
	Kadeiri	Mode	-	-	2nd	-	-	-	-	-	-	-
	Kadeiry	-	-	-	-	-	Mode	-	-	-	-	-
	Quadeir	2nd	-	2nd	Mode	-	-	-	-	-	-	-
	Qadeir	-	-	-	Mode	-	-	-	-	-	-	-
Forenames	Gadeir	-	-	-	-	-	-	2nd	-	-	-	Mode
	Gadir	-	-	-	-	Mode	-	-	2nd	-	-	-
	Gader	2nd	-	-	-	Mode	-	-	-	-	-	-
	Gadei	Mode	-	2nd	-	-	-	-	-	-	-	-
	Gadeia	-	-	2nd	-	-	-	2nd	-	-	-	-
	Gade	Mode	-	2nd	-	-	-	-	-	-	-	-
	Gdr	-	-	-	-	-	-	2nd	Mode	-	-	-
	Gadira	Mode	-	-	-	-	-	-	-	-	-	2nd
	Gadiri	2nd	Mode	-	-	-	-	-	-	-	-	-
	Gadeire	-	Mode	-	-	-	-	-	-	-	-	-
	Gadeiray	Mode	-	-	-	-	-	-	-	-	-	-
	Gadeiraya	-	-	-	-	-	-	-	-	-	-	-
	Gadara	Mode	-	-	-	2nd	-	-	-	-	-	-
	Kadeir	Mode	2nd	-	-	-	-	-	-	-	-	-
	Kadir	2nd	-	-	-	Mode	-	-	-	-	-	-
	Kadei	Mode	2nd	-	-	-	-	-	-	-	-	-
	Kadeira	-	2nd	-	-	-	-	2nd	-	-	-	Mode
	Kadeiri	-	Mode	-	-	-	-	-	-	-	-	-
	Kadeiro	-	-	-	-	-	-	-	-	-	-	Mode
	Quadeir	Mode	-	-	-	-	-	-	-	-	-	Mode
	Qadeir	-	-	-	Mode	-	-	-	-	-	-	-
	TOTAL	16.6	5.4	4.4	3.3	3.2	3.0	1.6	1.2	1.0	0.1	8.2

The regions of highest incidence have been marked either as *Mode* regions, or as regions of 2nd highest incidence, meaning the amount of persons who have this surname or first name. Rows and columns that would be empty, have been removed

Appendix table 7: Geographical distribution of traditional Greek names

Anthroponyms	Place names
Achilleas N=67, England 27, Cyprus 26, Greece 5, USA 5; fname N= 6374, Greece 4911, Cyprus 1098, England 122	D. Cyprus/Greece
Charalambos N=158, England 67, Cyprus 36, France 14, USA 9; forename N=11,303, Cyprus 9747, England 441, Greece 282, USA 223, Germany 142, South Africa 140	D. Cyprus/ Greece
Daniil N=1944, Greece 1676, Russia 151, Germany 29, Belarus 25; fname N=348,469, Russia 312,795, Belarus 14425, Kazakhstan 10,618, Uzbekistan 2717, Turkmenistan 1136, Greece 1119	D. in Greece/Russia
Effimia N=3, Indonesia 2, Greece 1; forename N=1988, Greece 1960, Indonesia 15, USA 8	D. in Greece/Greece
Fevronia N=0; fname N=3217, Greece 1548, Moldova 1361, Ukraine 117, Cyprus 88;	D. in nil/ Moldova
Galini N=2131, Lebanon 1760, Palestine 77, Brazil 68, UAE 54; forename N=934, Greece 826, USA 18, India 18, Albania 14, Cyprus 10;	D. Lebanon /Greece
Iakovos N=34, Greece 18, USA 9, Brazil 3, Canada 3; forename N=5711, Greece 5432, Cyprus 172, USA 66, Germany 27, England 22;	D. in Greece/Greece
Kallirroi N=0, forename N=2176, Greece 2149, Qatar 8, England 7;	Greece (4); D. in nil/Greece
Lavrentios N=34, Greece 22, USA 12; forename N=255, Greece 243, Cyprus 9;	D. in Greece/Greece
Lazaros N=525, USA 188, Greece 169, Canada 51, Nigeria 30, Australia 25; forename N=13,528, Greece 10,956, Zimbabwe 551, Cyprus 492, South Africa 405, USA 305	Greece (3); D. in Greece/Greece
Magdalini N=57, Greece 48, Romania 4, Cyprus 2; forename N=21,393, Greece 20,658, Cyprus 296, USA 105, Germany 82, India 61	D. in Greece/Greece
Natalia N=41,076, Indonesia 38,754, Italy 269, Brazil ; forename N=1,821,927, Ukraine 482,498, Brazil 231,771, Russia 171,603, Poland 160,450, Argentina 144,750, Spain 90,750	Ukraine , Poland(2), Mozambique ; D. in Indonesia / Moldova
Olympia N=837, Philippines 485, USA 201, Greece 21, Brazil 23; forename N=22,486, Greece 10,241, Philippines 4102, USA 3276, Brazil 2176, Tanzania 428;	Greece (3), Cyprus , Russia (Karelia), Ethiopia ; D. in Philippines /Greece
Panagioti N=164, Greece 125, Cyprus 14, USA 9; forename 103,769, Greece 98,926, Cyprus 2437, USA 1204, Germany 427, England 149;	D. in Cyprus /Greece
Rafaíl N=1072, Egypt 305, Greece 281, USA 203, India 82, Malaysia 23; forename N=20,150, Azerbaijan 7513, Russia 5904, Uzbekistan 1727, Greece 1141, India 1081, Kazakhstan 683;	D. in Greece/ Azerbaijan
Savvas N=3023, Greece 1870, Australia 326, Cyprus 229, England 205; forename N=24,592, Greece 15,190, Cyprus 7307, England 673;	Greece ; D. in Greece/Greece
Tasoula N=356, Greece 351, Bulgaria 1, Enland 1, Germany 1; forename N=1399, Cyprus 793, Greece 556, USA 26	D. in Greece/ Cyprus
Valentina N=5276, Indonesia 3499, Italy 266, Brazil 202, USA 180, Romania 152, Colombia 135, India 132; fname N=4679, Lithuania 4554, USA 34, England 28	France(2), Philippines (2), Russia (Pacific), Italy , Mauritius(2) ; D. in Indonesia / Moldova
Xanthe N=8, Brazil 2, USA 2, Belgium 1, England 1, Canada 1; forename N=1505, Australia 415, England 364, USA 263, South Africa 120;	Greece , Turkey ; D. in Singapore /Australia
Yannis N=147, USA 73, Greece 16, Papua New Guinea 8; forename N=8231, Greece 2915, France 2307, Gabon 441, Venezuela 367;	D. in Greece / Saint Pierre and Miquelon (USA)
Zenovia N=59, Indonesia 44, Romania 8, USA 5; forename N=6757, Peru 3551, Bolivia 698, USA 511, Romania 334, Venezuela 319, Cyprus 150	Romania ; D. in Romania / Cyprus
41 name families, 41 names (21 long, 8 short, 12 very short)	
Babis N=2133, Indonesia 1011, Poland 410, USA 235, Philippines 76, Hungary 49, Germany 46, Slovakia 36, Greece 34; fname N=1415, Greece 1126, India 76, DR Congo 41, England 37	Syria , Nepal , Poland , Turkey , D. in USA Virgin Islands & Poland /Greece
Chara N=19,218, Colombia 3907, India 3338, Peru 3257, Thailand 2005, Algeria 1163, Argentina 1136, Zimbabwe 861, Morocco 648, Kenya 529; fname 5874, Greece 1787, 1298, USA 1082, Philippines 352, Cyprus 303, Tanzania 96	Asian Russia(4), Greece , Afghanistan(2), China, South Korea (2), India(4), Pakistan(2), Nigeria(4), Ethiopia ; D. in Peru & Zimbabwe / Cyprus
Haris N=89,707, Indonesia 44,095, Pakistan 11,976, Saudi Arabia 9103, India 6252, UAE 2606; forename N=242,737, Indonesia 83,446, India 80,516, Saudi Arabia 33,979, Pakistan 16,275, Malaysia 4187, Bangladesh 3849	Iran(11, 12, 13), Palestine , Lebanon(2), Yemen(2), Liberia , Germany , Switzerland , Namibia , D. in UAE/Saudi Arabia
Myrto N=908, Albania 721, Greece 104, USA 58; fname N=3286, Greece 2626, Cyprus 134	Greece , D. in Albania /Greece
Sotos N=2534, Spain 1627, USA 434, Argentina 70; fname N=626, Cyprus 390, Greece 91, England 41, India 36	Spain (5), Bolivia; D. in Spain / Cyprus
Takis N=1462, Greece 491, Papua NG 385, USA 218, Estonia 50; forename N=5276, Cyprus 2213, Greece 1674, DR Congo 411, Papua NG 271	Papua NG , Papua NG &Greece/ Cyprus
Yanis N=5179, Indonesia 3341, Saudi Arabia 557, USA 310, Papua NG 286; forename N=15,607, Russia 3758, Indonesia 3405, Venezuela 1382, France 1210, Algeria 1091	Corded Ware Russia , French Guinea; D. in Panama & Indonesia / Latvia
Panos N=6468, USA 2849, Greece 1973, Israel 558, Philippines 310; forename N=7930, Greece 5112, USA 721, England 492, Cyprus 402, Saudi Arabia 233	Turkey , Spain , Croatia(14), Bosnia Herzegovina , Czechia(2); D. in Greece / Greece & Cyprus
Very short names	
Agni N=3632, India 1379, Indonesia 526, Bangladesh 451, Morocco 375, Philippines 303, Ivory Coast 196, USA 115; fname N=15,584; India 6292, Indonesia 2617, Nepal 2531, Greece 1613	India(5), Morocco(19), Ethiopia ; D. in Morocco / Cyprus
Demi N=5683, Burkina Faso 1074, Italy 858, Ivory Coast 570, Kosovo 425; fname N=22,765, Indonesia 7706, Ethiopia 3814, USA 1931, India 1622, Netherlands 1556	Ethiopia , Turkey , China(3), Chad(5), India , Indonesia , Somalia ; D. in Kosovo /Netherlands
Elli N=7074, Italy 3753, Philippines 900, India 353, Argentina 337, Turkey 336, USA 272, Indones. 168; fname N=56,160, Germany 20,738, Indonesia 9673, Greece 8206, Finland 5222	Iran(2), Greece , Micronesia , Argentina D. in Italy / Cyprus
Iris N=4306, USA 568, Dominican Republic 277, Philippines 272, Mexico 253, Russia 250; forename N=783,027, Germany 146,426, USA 92,581, Brazil 50,884, Venezuela 38,530, England 38,504	Romania (2), Turkey , Spain , Norway , New Zealand, Czechia , Mexico, Cuba, Canada, Ecuador, California, New Zealand, USA(4); D.in Bermuda & Hong Kong /Honduras & Germany
Keti N=4918, DR Congo 2613, South Africa 555, India 423, Indonesia 275, Turkey 202; forename N=19,723, India 4760, Uganda 3647, Russia 3459, Indonesia 2054, Bulgaria 697, Papua New Guinea 513	Armenia , Pakistan(3), Afghanistan , India , Indonesia(3), China, Mali , Papua NG , South Africa , Central African Republic ; D. in Solomon Islands / Cyprus
Nike N=10,696, India 4546, Iran 3853, Nigeria 737, Indonesia 506, South Africa 190; fname N=76,622, Nigeria 53,394, Indonesia 15,076, USA 1180, DR Congo 924	Kosovo , China, Nigeria ; D. in Iran / Nigeria
Olga N=13,863, Chad 3755, Russia, 2807, Ethiopia 2576, Belarus 750; forename 6,624,899, Russia 3,609,220, Belarus 313,361, Colombia 252,596, Mexico 237,666	Kazakhstan(2), Asian Russia(2), Kyrgyzstan(4), Greece , Uzbekistan , USA(9); D. in Chad / Belarus
Vaso N=5476, Pakistan 3777, Albania 294, India 277, Philippines 216, Papua NG 170, Iran 165; forename N=33,096, Pakistan 13,675, Bosnia and Herzegovina 3212, Serbia 1909, Greece 849	India , Italy , Norway(2); D. in Albania / Montenegro

Xene N=2, Botswana 1, Iran 1; fname N=27, Philippines 11, USA 6, England 2, South Africa 2	D. in Botswana/ Botswana
Zeno N=12,184, USA 3425, Syria 3068, Italy 1602, Tanzania 1206, Palestine 537, Lebanon 340; forename N=11,827, Brazil 2664, Italy 1819, Tanzania 1514, USA 950, DR Congo 562	USA(2), France(2), Turkey , Liberia , Mozambique , DR Congo , Cameroon ; D. in Syria/Montenegro
Gus N=1710, USA 350, Russia 291, Indonesia 186, Poland 185, Papua NG 136; fname N=48,899, USA 31,492, Canada 4854, Australia 2231, England 1052	Italia , Uzbekistan , India , Corded Ware Russia , Ethiopia , USA ; D. in Papua NG/Mariana Islands
Lia N=35,092, Indonesia 11,198, Bangladesh 7840, Ivory Coast 2570, Italy 2236, Brazil 1738, Ethiopia 1610; forename N=334,929, Indonesia 188,300, Brazil 19,196, Georgia 19,020	China(2), Malta , Georgia , Chad , Iran , Burkina Faso , Italy , Greece , Norway(7), Indonesia (3), Guinea-Bissau , Sweden , Bolivia ; D. in Malta/South Ossetia

Appendix table 8: Regional summary of the appearance of traditional Greek names

	Long names			5 letter names			3-4 letter names			At least 5 letter names			All names		
	Modes	Places	Tot.	Modes	Places	Tot.	Modes	Places	Tot.	Modes	Places	Tot.	Modes	Places	Total.
Bell Beaker Europe	4	3	7	1	10	11	3	6	9	5	13	18	8	19	27
Corded Ware Europe	2	3	5	1	2	3	1	12	13	3	5	8	4	17	21
Kurgan Europe	2	2	4	0	0	0	0	0	0	2	2	4	2	2	4
Balkans & Crete	21	12	33	7	17	24	0	4	4	28	29	57	28	33	61
Middle East	5	2	7	2	6	8	1	5	5	7	8	15	8	12	20
Central & Northern Asia	0	1	1	0	4	4	0	10	10	0	5	5	0	15	15
Gedrosia	0	0	0	0	9	9	2	5	7	0	9	9	2	14	16
Ext. India	0	0	0	1	5	6	4	9	13	1	5	6	5	14	19
Indochina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sundaland	5	2	7	4	1	5	4	6	10	9	3	12	13	9	22
China etc.	0	0	0	0	1	1	0	4	4	0	1	1	0	5	5
Japan and Koreas	0	0	0	0	2	2	0	0	0	0	2	2	0	2	2
East Africa	0	3	3	0	1	1	0	4	4	0	4	4	0	8	8
Maghreb	0	0	0	0	0	0	0	19	19	0	0	0	0	19	19
West Africa	0	0	0	0	5	5	3	10	13	0	5	5	3	15	18
Central & South Africa	0	1	1	0	1	1	2	3	5	0	2	2	2	5	7

Appendix table 9: Geographical distribution of Inuit names

USA as the mode region was not ignored because Inuit names may have migrated to Alaska and other parts of USA already at the ancient times.

	Anthroponyms	Place names
Inuksuk	Inuksuk N=2, Canada 2/2, forename N=0	Canada; D. in Canada/nil
Nanouk	Nanouk N=42, USA 39, Belgium 1, Germany 1, Iraq 1; forename N=264, Netherlands 249, Belgium 7	D. in USA/Netherlands
	Nanouki Ivory Coast 1/1; fname N=0	D. in Ivory Coast / nil
Nukiliq	Nukili Malaysia 1/1; fname N=5, India 3, Liberia 1, Malaysia 1	D. in Malaysia/Liberia
Qimmiq	Qimmiq USA 1/1, forename N=0	D. in USA/nil
	Kimmiq USA 1/1, forename N=0	D. in USA/nil
Amaruq	Amaruq Canada 8/8, forename N=0	D. in Canada/nil
	Amaruk N=10, Thailand 9, Papua NG 1; fname N=14, India 5, Indonesia 3, Venezuela 2	D. in Thailand / Papua NG
	Amaruk N=0; fname N=16, Ecuador 4, Mexico 3, Nicaragua 3, Venezuela 3	D. in Nicaragua
Ujurak	Ujurakal N=0, forename Nepal 2/2	D. in nil/Nepal
Kallik	Kallik N=85, USA 31, Hungary 21, India 15, Iran 7, Philippines 7, Russia 2, Cameroon 1, Poland 1; forename N=229, Iran 213, India 11, Philippines 2	Iran; D. in Hungary/Iran
	Kallik Pakistan 1/1; fname N=0	D. in Pakistan
Yotimo	Yotimo Philippines 1/1; forename N=0	D. in Philippines/nil
22 name families and 34 names (13 long, 16 short, 5 very short)		
Cupun	Cupun Indonesia 2/2; forename N=0	D. in Indonesia/nil
	Kupun N=501, Papua NG 417, Malaysia 51, Indonesia 27; fname N=420, Papua NG 373, Indonesia 31, India 11	D. in Papua NG/Papua NG
Kanaaq	Kanaq N=0, fname India 1/1	Greenland
Nunig	Nunig N=0, forename Azerbaijan 1/1	D. in Azerbaijan
	Nunik N=302, Indonesia 290, Taiwan 4; fname N=22,263, Indonesia 21,321, Armenia 693, Georgia 62, Taiwan 61, Russia 22, USA 21	Alaska, D. in Indonesia/Armenia
Panuk	Panuk N=31, Papua New Guinea 8, Russia 8, Ukraine 8, Indonesia 6; forename Azerbaijan 1/1	D. in Papua NG/Papua NG
	Panuq N=0; fname Indonesia 2/2	D. in nil / Indonesia
Pilip	Pilip N=1722, Poland 622, India 302, 193, USA 115, Russia 113, Canada 60, Romania 46, Malaysia 40, Moldova 39, Slovakia 39; forename N=2805, India 2043, Indonesia 332, Papua New Guinea 151, Malaysia 52, Croatia 52, USA 27, Georgia 25, Philippines 21, Serbia 18, Nigeria 18	D. in Papua NG/Faroe Islands
	Bilip N=303, Papua NG 246, Poland 41, India 11; fname N=244, Papua NG 169, India 58, USA 10	D. in Papua NG/Papua NG
Silla	Silla N=21,662, Sierra Leone 5254, Philippines 2743, India 1968, Indonesia 1768, Tanzania 1673, Italy 1373, Spain 1213, Mauritania 674, USA 570, Burkina Faso 551; forename N=7535, India 2084, Tanzania 1619, Papua New Guinea 791, Italy 531, Zambia 436, Iran 336, Ivory Coast 259, Indonesia 171, Uganda 114, USA 111	Spain(2), Estonia(6), Italy(2), Senegal(3), South Korea(2), Peru(2), Mexico, Nepal, India(3); D. in Sierra Leone/Papua NG
Taqtu	Taqtu Canada 23/23, forename USA 5/5	D. in Canada/USA
	Tactu N=4, Croatia 1, Panama 1, Romania 1, USA 1; fname N=0	D. in Panama / nil
	Taktu N=6, Nigeria 3, Indonesia 1, Poland 1, USA 1; fname N=13, India 12, Bhutan 1	Iran, Afghanistan(2); D. in Poland / Bhutan
Toklo	Toklo N=200, Benin 180, Ghana 9, Togo 4, Liberia 3, USA 2, Kenya 1, Nigeria 1; forename N=331, Ghana 225, Indonesia 41, India 19, Benin 17, Cameroon 14, Ivory Coast 13	India, Togo, Sweden; D. in Benin/Ghana
Tulok	Tulok N=701, Hungary 632, Philippines 31, Germany 8, Austria 7, Papua New Guinea 7, USA 7, Bangladesh 1, Belgium 1, Canada 1, England 1; fname N=30, Papua New Guinea 14, India 9, Philippines 2, Indonesia 1, Kyrgyzstan 1, Nauru 1, Singapore 1, USA 1	D. in Hungary/Nauru (Micronesia)
	Tuloc Philippines 19/19; fname Philippines 1/1	D. in Philippines
Very short names		
Aput	Aput N=1145, Philippines 641, Argentina 185, India 152, Indonesia 75, Uganda 38, Malaysia 37, Kenya 7, Papua New Guinea 3, Cuba 2, Brazil 1; fname N=374, Indonesia 352, India 7, Papua New Guinea 7, Armenia 2, Malaysia 2	D. in Philippines/Indonesia
Pana	Pana N=69,672, India 34,596, Romania 13,491, Guatemala 5756, Colombia 2735, Togo 1890, Venezuela 1449, Philippines 1073, Papua NG 887, Thailand 839, Indonesia 767; fname N=117,560, India 100,585, Nepal 10,551, Cameroon 1822, Indonesia 895, Thailand 608, Nigeria 605, Papua NG 357, Togo 330, Pakistan 289	USA, Slovakia(2), Tibet(2), Afghanistan(4), Burkina Faso, Gabon, Myanmar, Uzbekistan, DR Congo(3), Nepal, Laos, India, Bangladesh, Cameroon, Peru, Indonesia; D. In Romania / Nepal
Yuka	Yuka N=3038, Turkey 1067, DR Congo 917, Japan 312, Cameroon 250, Kenya 164, Papua NG, 126, Indonesia 88, Uganda 71, Nigeria 15, India 6; forename N=40,823, Japan 34,982, USA 1229, Egypt 1041, Thailand 936, Indonesia 503, Russia 461, Brazil 199, DR Congo 178	China(2), Tibet(1), Japan, Indonesia, Uganda, Zambia; D. in Papua NG/ Japan
Yura	Yura N=9620, Japan 4790, Mongolia 1600, India 703, Indonesia 567, Nigeria 444, Ukraine 362, USA 251, Peru 224, Thailand 172, Papua NG 142; fname N=9873, Armenia 1624, Angola 1620, Thailand 901, Poland 895, Ukraine 694, Indonesia 570, Mongolia 485, USA 342	France, Peru(4), Japan(7), Lithuania(3), Bolivia(2), Corded Ware Russia(2); D. in Japan/Armenia
Yutu	Yutu N=111, DR Congo 82, Indonesia 7, South Africa 7, Brazil 2, Papua NG 2, Peru 2, Taiwan 2, Uganda 2, Nigeria 1, Philippines 1; fname N=160, Taiwan 91, Indonesia 24, India 16, Cambodia 7, Papua NG 5, South Africa 4, USA 2, China 2	China(3); D. in DR Congo/Taiwan
No appearance: Adlartok, Alornerk, Atiqtaalq, Ikiq, Kumaglak, Siqiniq, Tehoronianhen, Adlartok		

Appendix table 10: Regional summary of the appearance of Inuit names

Region	Long names			5 letter names			4 letter names			At least 5 letter names		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total	Mode	Places	Total
Bell Beaker Europe	1	0	1	0	4	4	0	3	3	1	4	5
Corded Ware Europe	0	0	0	1	7	8	0	2	2	1	7	8
Kurgan Europe	0	0	0	1	0	1	0	0	0	1	0	1
Balkans	0	0	0	0	0	0	0	0	0	0	0	0
Middle East	0	0	0	2	0	2	2	0	2	2	0	2
Central and Northern Asia	0	0	0	0	0	0	0	1	1	0	0	0
Gedrosia	3	1	4	0	4	4	0	4	4	3	5	8
India, Nepal, Sri Lanka	1	0	1	3	4	7	2	2	4	4	4	8
Indochina	1	0	1	0	0	0	0	4	4	1	0	1
Sundaland	1	0	1	11	0	11	2	2	4	12	0	12
China etc.	0	0	0	0	0	0	1	5	6	0	0	0
Japan and Korea	0	0	0	0	2	2	2	8	10	0	2	2
East Africa	0	0	0	0	0	0	0	1	1	0	0	0
Maghreb	0	0	0	0	3	3	0	0	0	0	3	3
West Africa	0	0	0	3	1	4	0	3	3	3	1	4
Central and South Africa	0	0	0	0	0	0	0	0	0	0	0	0
North and Central America	6	1	7	1	2	3	0	1	1	7	3	10
Central America	0	0	0	0	1	1	0	0	0	0	1	1
South America	1	0	1	0	2	2	0	7	7	1	2	3
Greece and Egypt	0	0	0	0	0	0	0	0	0	0	0	0

Appendix table 11: Geographical distribution of Phoenician names

	Anthroponyms	Place names
Adhamon	Adhamon, N=3, USA 2, Sweden 1; forename N=0	D. in Sweden/nil
	Adhamoni, N=0, forename India 1/1	D. in nil/India
Abibaal	Abibaal N=0; forename N=3, USA 2, Nigeria 1	D. in nil/Nigeria
	Abibaali India 1/1; forename India 9/9	D. in India/India
Abirami	Abirami, N=247, India 213, Singapore 13, Saudi Arabia 4, Sri Lanka 4, Malaysia 2; forename, 4223, India 2478, Sri Lanka 1002, Malaysia 263, UAE 92	D. in Singapore/Sri Lanka
Adonibaal	Adonibaal N=0, forename Ukraine 1/1	D. in nil/Ukraine
Agreus	Agreus N=0; fname N=89, Tanzania 87, Haiti 1, Kenya 1	D. in nil / Tanzania
	Akreus USA 2/2; fname N=0	D. in USA / nil
Agrotos	Agrotos USA 1/1; fname N=0	D. in USA / nil
Ahinadab	Ahinadab, N=5, Indonesia 4, Cameroon 1	D. in nil/Cameroon
Ahirom	Ahirom N=0, forename, Mexico 1/1	D. in nil/Mexico
Ahummm	Ahummm N=0, forename Egypt 4/4	D. in nil/Egypt
Aletae	Aletae N=0; USA 2/2	D. in nil / USA
	Aletaye Ethiopia 1288/1288; fname Ethiopia 1271	D. in Ethiopia / Ethiopia
Amynos	Amynos N=0; fname South Africa 1/1	D. in nil / South Africa
	Amynou Morocco 1/1; fname N=0	D. in Morocco / nil
Aradus	Aradus N=0; fname India 7/7	Arwad/Aradus(locality, Syria), Aradus(ancient settlement, Bahrain); Aradous(hill, Mauritania); D. in nil/India
	Aratus N=80, France 77, Canada 1, Haiti 1, Nigeria 1; fname N=203, Nigeria 112, India 88, Brazil 2, Nepal 1	D. in France/Nigeria
Artemides	Artemides N=30, Cyprus 15, South Africa 12; fname N=9, Brazil 4, Argentina 3.	D. in Cyprus / Argentina
Astarte	Astarte N=43, France 20, USA 9, England 4, Philippines 3; fname N=70, USA 17, Mexico 14, Brazil 7	Astarte(locality, Spain); D. in France / Guyana

	Astart N=10, Kazakhstan 4, France 2, Russia 2, Indonesia 1; fname N=6, Russia 4, Germany 1, Japan 1	D. in Kazakhstan / Russia
Asclepius	Asclepius N=0; fname N=7, Brazil 4, Philippines 2, Italy 1	Gortyn – Asclepeion (archaeological site, Greece); Asclepion (archaeological site, Turkey); D. in nil / Philippines
Arotrios	Arotrika N=0; fname India 1/1	D. in nil / India
	Arodrio Uganda 1/1; fname N=0	D. in Uganda / nil
Baetylus	Betyluses Australia 1/1; fname N=0	D. in Australia / nil
Baetylia	Betylia N=0; fname Colombia 1/1	D. in nil / Colombia
Baaliahon	Baaliah South Africa 8/8, fname, India 1, South Africa 1	D. in South Africa/South Africa
Barekbaal	Barekbaal, N=0; forename Algeria 1/1	D. in nil/Algeria
Basilia	Basilia N=1198, Philippines 511, Georgia 259, Dominican Republic 108, Brazil 104, Indonesia 40; fname N=69,380, Peru 12,323, Bolivia 10,394, Mexico 7684, Philippines 7684, Paraguay 4108, Guatemala 3439	Basilia(locality, Congo), Basilia(locality, India); D. in Georgia/Bolivia
	Pasilia N=128, Indonesia 126, Papua NG 2; fname N=19, Indonesia 6, Uganda 4, Papua NG 2, Cameroon 1, Congo 1, Haiti 1, Nigeria 1, Tanzania 1, Wallis and Futuna 1, Zimbabwe 1	D. in Indonesia/Wallis and Futuna
Beruth	Beruth N=43, Brazil 29, Colombia 12, USA 2; fname N=24, Germany 6, Philippines 6, India 5, Brazil 4, Papua NG 1	D. in Colombia / Papua NG
	Beirut N=238, Iran 115, Iraq 79, Afghanistan 9, Ethiopia 9, Yemen 8; fname N=365, Iraq 145, Palestine 35, Mexico 31, Yemen 25, Nigeria 16	Beirut(city, Lebanon), Bierutów/Beirut(town, Poland), Beirut(locality, Seychelles); D. in Iraq/Palestine
	Peruth N=77, Germany 34, Rwanda 16, Czechia 15, Uganda 8; fname N=9242, Uganda 7541, Tanzania 1652, Rwanda 36	D. in Czechia / Uganda
Cabeiri	Cabeiri N=0; fname USA 8/8	D. in nil / USA
	Cabeira N=6, Brazil 4, Spain 1, USA 1; fname N=0	D. in Spain / nil
	Kabeiri Nigeria 1/1; fname Papua NG 3/3	D. in nil / Papua NG
	Kabeir N=4, India 1, Malaysia 1, Sweden 1, Syria 1; fname N=8; India 3, Pakistan 3, Canada 1, Saudi Arabia 1	D. in Sweden / Saudi Arabia & Pakistan
Dioscuri	Dioscuri N=0; Peru 1, Philippines 1	D. in nil / Peru
	Dioscurides N=0; fname Peru 2/2	D. in nil / Peru
	Dioscurina N=0; fname Peru 1/1	D. in nil / Peru
	Dioscure N=0; fname N=2, Gabon 1, Peru 1	D. in nil / Gabon
	Dioscura N=0; fname N=24, Philippines 23, Mexico 1	D. in nil / Philippines
Dadidus	Dadidu N=0; fname India 1/1	D. in nil / India
Elioun	Elioun Iran 1/1; fname N=0	D. in Iran / nil
	Eliouna Canada 1/1; fname N=4; Canada 1, Israel 1, Uganda 1, USA 1	D. in nil / Israel
Eimarmene	Mexico 2/2; fname N=0	D. in Mexico / nil
Eshmounhilles	Esmoun N=3, Iran 2, Nigeria 1; forename Iran 77/77	D. in Iran/Iran
Geinos	Geinos N=2, Brazil 1, USA 1	D. in Brazil / nil
Hannibal	Hannibal N=4624, USA 1954, Sri Lanka 512, Denmark 422, France 310, England 286, Germany 263, Morocco 170; fname, N=2436, Philippines 882, USA 630, Egypt 108, Indonesia 95, Denmark 94, DR Congo 75, Lebanon 51	D. in Grenada/Greenland
Hypsuranius	Uranus N=0; fname N=19, Indonesia 7, USA 7, Nigeria 3, Russia 1, Saint Lucia 1	D. in nil / Saint Lucia (Caribbean)
Halieus	Halieus N=0; fname Singapore 1/1	D. in nil / Singapore
Hephastaeus	Hephastaeus N=0; fname N=2, Afghanistan 1, USA 1	D. in nil / Afghanistan
Kronos	Kronos N=105, Russia 43, USA 7, Czechia 7, England 5; fname N=42, Russia 20, Brazil 3	Kronos(peak, Greece); D. in Iceland / Guyana
	Cronos N=53, USA 26, Russia 4, Portugal 4; fname N=53, Mexico 18, Brazil 7, Russia 7	D. in Portugal / Costa Rica
Meilichios	Meilichien N=0; USA 3/3	D. in nil / USA
Melcathrus	Melcatr USA 1/1; N=0	D. in nil / USA
Melqart-Shama	Melqart, N=0; forename Slovenia 1/1	D. in nil/Slovenia
Nereus	Nereus N=366, Haiti 264, USA 44, Cameroon 19, Kenya 9; fname N=552, Tanzania 91, Malaysia 91, Philippines 59, Nigeria 55, USA 42, India 35	D. in Haiti / Tanzania & Haiti
	Nereusa N=0; fname N=27, Brazil 26, Philippines 1	D. in nil / Brazil
Pontus	Pontus N=1474, France 530, Belarus 228, Poland 215, Ukraine 127; fname N=9298, Sweden 8401, Finland 320, Indonesia 147	Pontic/Pontos(Mountains, Turkey), Pontus(suburb, Finland), Pontus(hamlet, France); D. in Belarus / Sweden
	Bontus N=150, France 92, Germany 17, Switzerland 11, Indonesia 6, Nigeria 6; fname N=27, Nigeria 24, Papua NG 1, South Africa 1, USA 1	D. in France / Nigeria
	Pontush N=0; fname India 7/7	D. in nil / India
Samothracas	Samothrace N=0; fname N=3, France 1, Indonesia 1, Ivory Coast 1	D. in nil / Ivory Coast
Sikarbaal	Sikarbar, India 4/4; forename N=0	D. in India / nil
Sioton	Siotonu N=0; fname Tonga 1/1	Sioton(locality, France); D. in nil / Tonga
Taautus	Taautu N=0; fname India 1/1	D. in nil / India
	Tautus N=0; fname N=14, Indonesia 12, Brazil 1, USA 1	D. in nil / Indonesia
Technites	Technitis N=27, Greece 24, Australia 2, Switzerland 1; fname N=0	D. in Greece / nil
	Techniti N=0; fname Thailand 1/1	D. in nil / Thailand
	Technitien Morocco 1/1; fname Tunisia 1/1	D. in Morocco / Tunisia
Titanides	Titanida N=0; fname Russia 1/1	D. in nil / Russia
Typhon	Typhon N=20, France 17, Germany 1, Turkey 1, USA 1; fname N=36, DR Congo 21, USA 5	D. in France / Guyana
	Typhone N=12, Tanzania 9, Canada 2, England 1; fname N=8, Tanzania 4, USA 2, Netherlands 1, Zambia 1	D. in Tanzania / Tanzania

Urumilki	Urumil N=0, fname N=4, Nepal 2, India 1, Indonesia 1	D. in Nepal
Yada'milk	Yadamilla, India 1/1	D. in India
Yehomilk	Yehomin N=0; fname 14, Benin 13, Ivory Coast 1	D. in nil / Benin
62 name families, 108 names (77 long, 30 short, very short 1)		
Adonibaal	Adoni N=5105, Ivory Coast 2247, India 1934, South Africa 132, USA 124, Nigeria 98, Italy 92, Cyprus 75, DR Congo 34; forename N=2683, Ivory Coast 866, India 488, DR Congo 219, Indonesia 151, Brazil 129, Tanzania 97, Philippines 79, Nigeria 68.	Adoni (city, India), Nuraghe Adoni (archaeological site, Sardinia) Adoni(village, Romania); D. in Ivory Coast/Ivory Coast
Agros	Agros N=58, Venezuela 17, France 13, Nigeria 8, Russia 8, Brazil 4; fname N=32, Indonesia 7, Philippines 5, DR Congo 4, Russia 4, USA 3	D. in Venezuela & France / Trinidad-Tobago
	Agrosi N=142, Italy 139, Equador 1, Switzerland 1, Thailand 1; fname N=3, Brazil 1, Italy 1, Nigeria 1	D. in Italy / Italy
	Agrose N=0; fname N=5, Philippines 4, India 1	D. in nil / Philippines
Aradus	Aradu N=554, India 444, Nigeria 104, Indonesia 5; fname N=169, India 145, Nigeria 14, Indonesia 8	Aradu(village, Georgia); D. in Nigeria/India
Baali	Baali N=24,928 Algeria 12,330, Morocco 7055, Yemen 3084, France 569, India 434, Saudi Arabia 358, Uganda 307, Egypt 122, Spain 111; forename N=1052, India 593, Morocco 164, Pakistan 40, Nigeria 23, Indonesia 18, Afghanistan 12, Uganda 9, Cambodia 7	Baali(village, Algeria), Baali(village, Algeria), Bā 'Alī (ruin, Iran), Baali (locality, Indonesia), Buur Baali (hill, Somalia) D. in Algeria/Morocco
Barekbaal	Barek, N=19,555, India 9052, Bangladesh 7209, Indonesia 1065, Algeria 564, Mauritania 545, Iran 173, Morocco 170, Czechia 154, France 146, fname N=8954, India 6884, Bangladesh 733, Morocco 655, France 224, Pakistan 177, Indonesia 176	Barok (village, Ukraine), Oulad M'Barek (locality, Morocco), Barik/Barek(village, Syria), Bareke(Punjab, India), Bareka(Rajasthan, India), Barekmiah Para(Tripura, India), Barek (locality1, Malang, Indonesia), Barek (locality2, Malang, Indonesia), Barek(locality, Madiun, Indonesia), Barek (locality, Bojonegoro, Indonesia), Barek (locality, Lamongan, Indonesia), D. in Mauritania/Morocco
Batnoam	Batno N=3, India 1, Pakistan 1, France 1; fname N=20, India 18, Afgh 1, Azerb 1	Batno (peak, Croatia), Batnor(Uttar Pradesh, India), Batno (well, Niger), Batno; D. in France/Azerbaijan
Belus	Belus N=1653, Haiti 752, France 278, USA 262, Belarus 167, Russia 71; fname N=55, Indonesia 14, USA 12, Haiti 5, DR Congo 4	D. in Haiti / Haiti
	Belush N=603, Belarus 400, Russia 99, USA 57, Ukraine 31; fname N=10, India 7, Albania 2, Bulgaria 1	D. in Belarus / Albania
	Pelus N=329, France 168, Italy 48, Spain 33, USA 19, Indonesia 18; fname N=226, Uganda 159, Indonesia 30, Tanzania 15, India 14	D. in France / Uganda
	Beluse N=538, India 463, Canada 68, Latvia 4; fname N=13, DR Congo 4, USA 4, Brazil 2, South Africa 2	D. in Latvia / DR Congo
	Belusi N=39, Brazil 26, Papua NG 4, N=13, South Africa 7, Uganda 3	D. in Papua NG / South Africa
Beruth	Berut N=369, Turkey 148, France 121, Poland 45; fname N=47, Indonesia 33, India 6, Russia 2, Thailand 2	Berūt(village, Pakistan), Berut(hamlet, Indonesia), Imeni Kirova/Berut (locality, Turkmenistan); D. in Turkey / Slovenia
Dagon	Dagon N=2478, Philippines 1246, USA 360, France 337, Switzerland 147; fname N=1849, Ivory Coast 1691, USA 36	D. in Switzerland / Ivory Coast
Dione	Dione N=91,590, Senegal 85,147, Mali 2259, Cameroon 2259, France 369; fname N=39,873, Brazil 29,410, USA 4382, Philippines 1940, Canada 434	D. in Senegal / Malta
Epigeius	Epige N=0; fname Indonesia 4/4	D. in nil / Indonesia
Itthobaal	Ittho N=0; forename, India 1/1	D. in nil/India
Magus	Magus N=639, Indonesia 193, Canada 124, Australia 74, USA 56; Russia 52, Estonia 38, Papua NG 16, Nigeria 15; fname N=2194, Indonesia 2005, DR Congo 68, USA 25, Nigeria 15, India 11	D. in Estonia / Indonesia
	Magusu N=398, Tanzania 204, Zambia 183, Zimbabwe 6; fname N=12, Tanzania 7, South Africa 3, Zambia 1, Zimbabwe 1	D. in Zambia / Tanzania
Melqart-Shama	Shama, N=49,812, India 11,046, Pakistan 9558, Bangladesh 8471, Egypt 7962, Lebanon 2275, Syria 1432, Jordan 1347, Israel 119, DR Congo 1060, Ukraine 683; fname N=334,139, India 173,118, Pakistan 110,151, Sudan 18,046, Bangladesh 8157, Afghanistan 3625, UAE 3295, Sri Lanka 2361, Russia 2108	Shama (district, Ghana), North Kordofan/Shamal(Sudan), Chamba/Shama(locality, Ghana), Shama(village, Lebanon), Shama(village, Iraq), Shemme/Shama(Iraq), Gaza ash Shamaliya(Palestine), Chamaa(locality, Lebanon); D. in Lebanon/Pakistan
Misor	Misor N=72, India 61, Malaysia 5, Kenya 4, Greece 1, Poland 1; fname N=119, India 93, Indonesia 10, Israel 3, Malaysia 3, Abkhazia 2, Pakistan 2	D. in Malaysia / Abkhazia
	Misori N=410, Cameroon 351, Thailand 12, Tanzania 10, Kenya 9; fname N=592, Cameroon 547, India 29, Tanzania 5	D. in Cameroon / Cameroon
	Misora N=0; fname N=52, Peru 11, Japan 7, USA 6, Brazil 5, Venezuela 3, India 3	D. in nil / Kosovo
	Misore N=29, Kenya 18, India 6, Papua NG 2; fname N=17, DR Congo 4, India 3, Kenya 2, Papua NG 2, Venezuela 2	D. in Kenya / Papua NG
Paltibaal	Palti, N=2119 India 1054, Philippines 875, Israel 34, Turkey 29, Peru 28, USA 23, Argentina 20, Papua New Guinea 16; forename N=5671 Nepal 4198, India 880, Indonesia 504, Papua New Guinea 18, Philippines 16	Palti (locality, Nepal), Palti(locality, Uttar Pradesh, India), Paltin(locality, Romania), Palti(locality2, Uttar Pradesh, India), Palthi(locality, Karnataka, India); D. in Philippines/Nepal
Sidon	Sidon N=3589, Philippines 1322, Israel 636, Thailand 368; fname N=1931, Uganda 637, Indonesia 398, DR Congo 199	Sidon(ancient city near Bahrain); D. in Israel / St. Vincent and the Grenadines
	Siton N=4058, Philippines 3693, Brazil 108, USA 68, Malaysia 39, Benin 30; fname N=467, Indonesia 228, India 127, Malaysia 36, Uganda 16	Siton (locality, Indonesia); D. in Solomon Islands/Philippines
Sikarbaal	Sikar N=907, India 300, Tanzania 171, Liberia 61, Kuwait 58, Papua New Guinea 57, Indonesia 52, UAE 48, Nigeria 46; fname N=2501, India 1497, Indonesia 785, UAE 51, Philippines 38, Malaysia 36, Nepal 19, Iran 10, Azerbaijan 7	Sikar (city, Rajasthan, India), Sikar(county, Rajasthan, India), Sikar (hamlet, Dagestan, Russia), Sikar (locality, Dagestan, Russia), Sikār (locality, Bihar, India), Sikār (locality, Tamil Nadu, India), Zikar(hamlet Papua NG), Shikar (Bangladesh); D. in Northern Cyprus/UAE

Suduc	Suduc N=69, Romania 49, Moldova 18, Taiwan 2; fname N=0	D. in Moldova / nil
	Suduca France 8/8; fname N=0	D. in France / nil
	Suduck N=0; fname South Korea 1, USA 1	D. in nil / South Korea
	Suduco N=0; fname Brazil 2/2	D. in nil / Brazil
Very short names		
Tyre	Tyre N=3728, USA 3124, Canada 126, England 93, Northern Ireland 77, Scotland 64, France 53, China 24, South Africa 23, India 23, New Zealand 21; fname N=736, USA 680, Nigeria 13, Croatia 4, Papua NG 4	D. in Northern Ireland /United States Virgin Islands
No incidence: Azmelqart, Baalaton, Bôdashart, Eshmouniaton, Ummashtart, <i>Agrueros, Chrysor, Autochton, Corybantes</i> ;		

Appendix table 12: Regional summary of the appearance of Phoenician names

Region	Long names			5 letter names			Total names		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	10	3	13	5	1	6	15	4	19
Cord Ware Europe	9	2	11	1	0	1	10	2	12
Kurgan Europe	1	0	1	1	3	4	2	3	5
Balkans	1	2	3	0	1	1	1	3	4
Middle East	3	5	8	1	10	11	4	15	19
Central and Northern Asia	1	0	1	0	1	1	2	1	3
Gedrosia	5	0	5	1	2	3	5	6	11
India, Nepal, Sri Lanka	15	1	16	17	13	30	32	14	46
Indochina	1	0	1	0	1	1	1	1	2
Sundaland	14	0	14	13	10	23	27	10	37
China etc.	0	0	0	0	0	0	0	0	0
Japan and Korea	0	0	0	2	0	2	2	0	2
East Africa	8	1	9	5	2	7	13	3	16
Maghreb	4	1	5	2	3	5	6	4	10
West Africa	7	0	7	5	2	7	12	2	14
Central and South Africa	3	1	4	3	0	3	6	1	7
Greece and Egypt	2	2	4	0	0	0	2	2	4

Appendix table 13: Geographical distribution of Mitanni names

	Names	Places
Shuttarna	Shuttar, India 4/4; forename N=3, India 2, Malaysia 1	D. in India/ Malaysia
	Sutarna N=2801, Indonesia 2797, USA 2; forename N=2034, Indonesia 2027, India 4	D. in Indonesia/Indonesia
Parrattarna	Parratta N=2, India 1, Philippines 1; forename USA 5/5;	D. in USA/USA
	Barattar India 4/4; forename N=0	D. in India/nil
	Paratamayakkar N=0, forename India 1/1	D. in India/nil
Shaushtatar	Shaushta N=0, fname N=38, India 28, USA 7, Pakistan 3	D. in India/nil
	Shaush N=31, Russia 22, Ukraine 3, Kyrgyzstan 2, Australia 1, India 1, Kenya 1, Pakistan 1; fname N=9, India 7, Ukraine 1, USA 1	Shaushoky (hill, Kazakhstan); D. in Kyrgyzstan/Ukraine
Artatama	Artatama Indonesia 13/13; forename N=0	D. in Indonesia/nil
Ritadhama	Ritadhamiriya N=0, forename India 1/1	D. in nil/ India
Artashumara	Shumara N=349, Ukraine 202, Russia 113, Pakistan 21, England 4, Kazakhstan 4, Italy 2; fname N=81, Pakistan 55, Americas 19, India 7	Shamara/ Shumāra (locality, Pakistan), Shumarahwali (locality, Pakistan); D. in Ukraine /Uruguay
11 name families and 18 names (10 long, 7 short, 1 very short)		
Ritadhama	Ritad N=3, Taiwan 2, Yemen 1; fname N=29, India 24, USA 4, Indonesia 1	Ritad (hill, Iran); D. in nil/ India
Saukshatra	Shatra N=186, Egypt 122, India 48, Albania 5; forename N=208, Afghanistan 74, India 62, Uganda 39	Al-Shatrah (city, Iraq), Šatra (village, Serbia), Shatra (hamlet, Russia), Shatra (locality, Russia), Shatrah (village, Yemen), ; D. in Transnistria / Afghanistan
Parshatar	Parhsa N=1694, India 1451, Pakistan 141, USA 52, Iran 37, Bangladesh 4, Afghanistan 2; forename N=1995, India 1345, Bangladesh 550, USA 61, UAE 8	Parsha (hamlet, Russia), Parsha (locality, Russia), Parsha (stream, Russia), Parsha (locality, Bangladesh), Parshan (fortress , Uzbekistan), Parshādepur (village, India), Parsha (locality, Pakistan); D. in India/ Bangladesh
Shattiwaza	Shatti N=3314, Syria 2482, Iraq 278, India 205, Kuwait 116, Israel 60, Pakistan 38, Nigeria 32; fname N=320, India 273, Tunisia 9, Jordan 8, Palestine 6, Pakistan 5, Syria 5	Shatti (stream, Sudan), Shaṭṭī (wadi, Jordan), Shaṭṭī (locality, Iraq), Shattī (ruin, Syria); D. in Syria / Tunisia
Kirta	Kirta N=852, India 486, Russia 155, Indonesia 92, Niger 60, Turkey 42, Nigeria 7; forename, N=1543, India 1286, Nepal 106, Indonesia 101, Finland 20	Kīrtah (locality, Afghanistan), Kirta (locality, Pakistan), Kirta (locality, Pakistan), Kirta (hamlet, Burkina Faso)

		Faso), Kirta (village, India), Topyoly/Kirta (village, Turkey); D. in Niger/Nepal
	Girta N=2, India 1, Lithuania 1; fname N=99, India 74, Estonia 6, USA 5, DR Congo 4	Girta (area, Somalia), Girta (hill, Somalia); D. in Lithuania / Estonia
Wasashatta	Shatta N=7799, Egypt 3539, Sudan 3360, Saudi Arabia 398, Ghana 277, Tanzania 91, Nigeria 38; forename N=446, Egypt 304, Indonesia 51, India 40, Nigeria 15, Bangladesh 9	Shatta (hamlet, Russia), Shatta (village, Russia), Shatta (locality, Russia), Shatta (village, Sudan), Shatta (locality, Russia), Shatta (locality, Russia); D. in Sudan/Egypt
Very short names		
Wasashatta	Wasa N=8459, Nigeria 2709, DR Congo 1327, Indonesia 1152, Papua NG 1003, Pakistan 592, South Africa 455; forename N=5023, Nigeria 1813, 984, 509, Papua NG 402, Sri Lanka 358.	Finland, Tanzania, Japan(3), Afghanistan, Yemen, DR Congo, Uganda, Nigeria(3), Germany, Zambia(2), Papua NG, India; D. in Papua NG/ Papua NG, Nigeria
No incidence: Shattura, Artashumara		

Appendix table 14: Regional summary of the appearance of Mitanni names

Region	Long names			5 letter names			Total names		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	0	0	0	0	0	0	0	0	0
Corded Ware Europe	2	0	2	0	10	10	2	10	12
Kurgan Europe	0	0	0	0	0	0	0	0	0
Balkans	0	0	0	0	1	1	0	1	1
Middle East	0	0	0	4	6	10	4	6	10
Central and Northern Asia	0	1	1	0	1	1	0	2	2
Gedrosia	1	2	3	1	6	7	2	8	10
India, Nepal, Sri Lanka	8	0	8	7	2	9	15	2	17
Indochina	0	0	0	0	1	1	0	1	1
Sundaland	3	0	3	0	0	0	3	0	3
China etc.	0	0	0	1	0	1	1	0	1
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	0	0	0	0	3	3	0	3	3
Maghreb	0	0	0	0	0	0	0	0	0
West Africa	0	0	0	0	1	1	0	1	1
Central and South Africa	0	0	0	0	0	0	0	0	0
Greece and Egypt	0	0	0	3	0	3	3	0	3

Appendix table 15: Geographical distribution of Indo-Asiatic names

	Anthroponyms	Place names
Agastya	Agastya N=833, Indonesia 581, India 181, USA 41, New Zealand 12; fname, N=524, India 266, Indonesia 194, Thailand 24	D. in Indonesia/Mauritius
	Akastiya India 1/1; fname N=0	D. in India/Nil
Andhaka	Andhaka N=5, India 3, Indonesia 1, Uganda 1; fname N=10, Indonesia 10;	Uganda; D. in Uganda/Indonesia
	Anthakal India 2/2; fname N=0	Anthakapalle(India), Anthakak(locality, Oman)
Sagara	Sagara N=81,996, Mali 50,724, Japan 20,542, Sri Lanka 5774, Indonesia 1081, India 885, Ivory Coast 250; fname 24,762, India 14,719, Sri Lanka 9586, Pakistan 104, UAE 39, Africa 44	India(4), Japan(J1, J2, J3), Tanzania(T1, T2, T3), Ethiopia, Mali(M1, M2), Indonesia(I, I), Burundi(B1, B2); D. in Mali/Sri Lanka
	Sakara N=5333, Ghana 970, Tanzania 843, Zimbabwe 560, Ukraine 535, Kenya 345; Russia 322; Kazakhstan 294, Egypt 214, Transnistria 205; fname N=3906, India 2621, Bangladesh 733, Tanzania 155, DR Congo 116	Saqqara (village, Egypt), Kestanelik/Sakara(village, Turkey), Sakara(village, Uttar Pradesh, India), Sakara(village, Maharashtra, India), Sakara(village, Nigeria), Sakara Mauje(Bihar, India), Sakara(Village, India), Sakara(village, Chad); D. in Transnistria/Bangladesh
Rishyasringa	Rishyasringa India 3/3; forename India 25/25	D. in India/India
Anusuya	Anusuya N=1824, India 1806, UAE 8; forename, N=70,735, India 69,206, Bangladesh 733, Sri Lanka 358; Malaysia 119, USA 95, South Africa 43	India; D. in India/India
	Anusua India 2/2; fname N=1895, India 1414, Bangladesh 458, England 6, USA 6	D. in India/Bangladesh
Satyavati	Satyavati N=1444, India 1441, Russia 1; forename N=61,119, India 60,795, Nepal 278	D. in India/India
	Satiavati N=0; fname India 1/1	D. in nil/India

Yashodha	Yashodha N=1451, India 937, Sri Lanka 512, Malaysia 1, Sweden 1; forename N=14,276, India 11,378, Sri Lanka 2861, South Africa 12	D. in Sri Lanka/India
	Yashoda N=7271, India 7243, Qatar 9, Sri Lanka 9, Pakistan 2; Tanzania 1; fname N=360,360, India 357,929, Sri Lanka 1717, USA 147, South Africa 108, Mauritius 77	Yashodapurnagar(India); D. in India/India
Narmada	Narmada N=2416, India 1789, Sri Lanka 365, Indonesia 220, UAE 30; forename N=110,319, India 106,245, Sri Lanka 3648, England 165;	India(2), Indonesia , Cameroon ; D. in Sri Lanka / Sri Lanka
	Narmata N=156, India 155, USA 1; fname N=7671, India 7665, Bhutan 1, Ivory Coast 1	D. in India/
Bharat	Bharat N= 22,272, India 18,835, Pakistan 1237, Trinidad and Tobago 484, Guyana 384; forename N=966,658, India 900,633, Nepal 44,669, USA 5697, England 3079, Saudi Arabia 2,564, Oman 927	Pakistan(4), Bangladesh(3), India(3); D. in Guyana/Nepal
	Barat N=163,023, Kazakhstan 106,786, Afghanistan 24,662, India 13,066, France 4720, Iran 4223, Indonesia 2403, Pakistan 1184; fname N=42,991, Iran 23,608, Afghanistan 6437, India 4540, Pakistan 4442, Azerbaijan 1789, Bangladesh 550	Barat(country, India), West Kalimantan/Barat(province, Indonesia), West Sumatra/Barat (province, Indonesia), Barat(village, Croatia), Barat(village, Istria, Croatia), Western Java/Barat(part of an island, Indonesia), West Nusa Tenggara/Barat(province, Indonesia), Barat(hamlet, Yemen), West Jakarta/Barat(area, Indonesia), West Bandung/Barat (regency, Indonesia), Burat/Barat(hamlet, Yemen), Barat(hamlet, Taizz, Yemen), West Sulawesi/Barat(province, Indonesia). D. in Kazakhstan/Iran
Haryana	Haryana N=3285, Indonesia 3073, India 144, Sweden 21; fname N=2388, Indonesia 2142, Malaysia 144	Haryana(state, India), Haryana(village, Pakistan), Haryana(village, Pakistan); D. in Indonesia/Indonesia
	Haryana N=1741, Indonesia 1718, UAE 11, Singapore 4; fname N=3198, Indonesia 2843, Brazil 149, Malaysia 122	Haryana(village, India), Haryana(locality, Pakistan), Haryana(locality, Gujarat, India), Haryana(locality, Pakistan), Haryana(locality, Uttar Pradesh, India), Haryana(locality, Uttar Pradesh, India); D. in Indonesia/Indonesia
Kashmir	Kashmir N=8418, Indonesia 7275, Pakistan 630, UAE 126, Iraq 110, Tanzania 89, India 76, Iran 67; forename, N=149,489, India 142,180, Afghanistan 3984, England 1452, UAE 246	India(4), Iran , Pakistan(7), Afghanistan ; D. in Afghanistan/Afghanistan
	Kashmir N=1173, Indonesia 499, Tanzania 196, USA 168, India 90; fname N=14,680, India 8603, Indonesia 5176, Tanzania 230, Nepal 145, Philippines 103	Kashmiri Chak(India), Kashmirisan(India), D. in Indonesia/Indonesia
Bengal	Bengal N=2237, India 879, Bangladesh 811, Philippines 150, Afghanistan 128; forename N=770, Bangladesh 458, India 215, Afghanistan 76, USA 11, Pakistan 4.	India(3), Indonesia , Philippines , Bangladesh ; D. in Bangladesh/Bangladesh
	Pengal N=206, USA 77, India 63, Slovenia 38, Canada 11, Poland 7; fname N=49, India 43, Pakistan 3, Papua NG 2	D. in Slovenia/Papua NG
Kerala	Kerala N=1871, India 731, Saudi Arabia 557, UAE 340, Kuwait 135; forename N=372, India 280, USA 27, Ethiopia 25	India(2), Afghanistan(2), Iran , Kazakhstan; D. in UAE/Qatar
	Gerala N=156, Argentina 84, Mexico 46, India 14, USA 9; fname N=51, Indonesia 31, Brazil 6, USA 4	D. in Argentina/Albania
20 name families, 32 names (25 long, 6 short, 1 very short)		
Indra	Indra N=35,988, Indonesia 28,908, India 5013, Czechia, 483, Malaysia 336, Germany 138; forename N=900,113, India 428,851, Indonesia 302,326, Nepal 134,274, Sri Lanka 4650	Latvia(2), Estonia(2), India(8), Corded Ware Russia , Indonesia , Bangladesh , Nepal , Georgia ; D. in Liechtenstein/Nepal
Sindhu	Sindhu N=11,985, India 6928, Pakistan 3488, Saudi-Arabia 598, USA 189, England 150, Indonesia 139, Canada 115; fname N=302,074, India 295,307, Nepal 902, USA 814, Indonesia 702, Oman 686, Saudi Arabia 641, Qatar 583, Pakistan 572, Bangladesh 458, Sri Lanka 358, England 256, Bahrain 104, Malaysia 95, Kuwait 95, Canada 73, Australia 60	Sindh (district, Pakistan), Sindhudurg (locality, Mahastra/ India), Indus (river, Tibet/China), Sindhu (village, Rajasthan/ India), Sindhavalli (locality, Mysore/ India), Sandhu (locality, Punjab/ Pakistan), Sindhu (locality, Rajasthan/ India), Sindhu (locality, Khyber Pakhtunkhwa/ Pakistan), Sindhupura (locality, Rajasthan/ India), Sindhu (locality, Nepal), Sindhupur (locality, Gokan/ India), Sindhu (beach, Indonesia); D. in Pakistan/Qatar
Bihar	Bihar N=2805, India 1843, Pakistan 452, Afghanistan 168, Croatia 113; forename N=1687, India 861, 500, Afghanistan 113, Egypt 108, Indonesia 76.	India(20), Pakistan , Romania(3), Hungary , Bangladesh ; D. in Croatia/Afghanistan
Jammu	Jammu, N=7763, India 7294, Canada 135, USA 73, Australia 67, UAE 48, Nigeria 48; forename N=4565, India 4346, Nigeria 92, Nepal 35	India(7), Pakistan(4); D. in India/Estonia
Assam	Assam N=15,288, Nigeria 3640, Algeria 2559, Cameroon 2423, Morocco 1363, Malawi 941; forename N=8476, Yemen 2646, Israel 1297, Egypt 672, Iran 603, Nigeria 596, India 568	India , Yemen , Cameroon(4), Oman , Mozambique ; D. in Gabon/Israel

Tamil	Tamil N=2701, India 1042, Sri Lanka 512, Pakistan 192; forename, N=21,462, India 14,827, Malaysia 3752, Sri Lanka 644, Saudi Arabia 408, UAE 290	Philippines , Micronesia , Marshall Islands ; D. in Sri Lanka/Malaysia
1 very short name		
Asia	Asia N=42,276, Bangladesh 11,896, Indonesia 9696, Ethiopia 5795, Philippines 2731, DR Congo 2627, Pakistan 1756, Nigeria 1366, Iran 1308, Uganda 810, India 770; forename N=521,472, Bangladesh 89,447, Tanzania 82,947, Pakistan 66,748, Poland 40,478, Sudan 29,350, India 27,870; Iraq 15,402	Philippines , India (2), Italy , Bangladesh (2), Equatorial Guinea , Norway , Cameroon , Yemen , Cyprus , Lebanon (2), Cameroon (2), Gabon , Peru , Mexico (2), Jamaica ; D. in Bangladesh/Eritrea
The following variants were used as migration markers but were not included into the statistics		
Benguela, Sindu, Sintu, Indus, Intra		

Appendix table 16: Regional summary of the appearance of Indo-Asiatic names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	0	0	0	0	2	2	0	2	2
Corded Ware Europe	0	0	0	0	6	6	0	6	6
Kurgan Europe	0	0	0	0	4	4	0	4	4
Balkans	0	2	2	0	0	0	0	2	2
Middle East	0	5	5	1	6	7	1	11	12
Central and Northern Asia	1	1	2	0	0	0	1	1	2
Gedrosia	1	21	22	0	6	6	1	27	28
India, Nepal, Sri Lanka	33	29	62	9	41	50	42	70	112
Indochina	1	3	4	2	4	6	3	7	10
Sundaland	8	12	20	1	6	7	9	18	27
China etc.	0	0	0	0	1	1	0	1	1
Japan and Koreas	0	3	3	0	0	0	0	3	3
East Africa	0	7	7	0	0	0	0	7	7
Maghreb	0	0	0	0	0	0	0	0	0
West Africa	3	5	4	1	8	9	4	13	17
Central and South Africa	0	0	0	0	2	2	0	2	2
Greece and Egypt	0	1	1	0	0	0	0	1	1

Appendix table 17: Geographic distribution of Ethiopian names

Forenames	Places
Salana N=4009, India 3692, USA 68, Indonesia 58	Russia (Asia), India (10) D. in Solomon Islands / Jersey
Behati N=31, India 27, USA 2, DR Congo 1, Iran 1, Lithuania 1	D. in Iran/Lithuania
Shango N=1116, Tanzania 342, Pakistan 265, DR Congo, USA 68	Burundi (2), India , Nigeria (2), DR Congo , Rwanda (2), France ; D. in Tanzania/ Botswana
Chinua N=368, Nigeria 177, USA 92, India 59, England 16	India ; D. in Kenya /Saint Kitts and Nevis (Caribbean)
Ephrem N=65,918, Ethiopia 47,854, Rwanda 8943, DR Congo 2684, Togo 1319, USA 524, Cameroon 517, India 467	D. in Ethiopia/ Rwanda
Marjani N=4684, Indonesia 4304, Afghanistan 120, USA 69, Iran 50, India 37	Iraq , Albania , Bosnia and Herzegovina , Croatia ; D. in Iran/Indonesia
Kamali N=220,790, India 202,424, Nepal 10,899, Indonesia 2633, Iran 1684	D. in Rwanda/Nepal
Subira N=64,661, Tanzania 62,737, Kenya 1310, India 332, DR Congo 110	Tanzania ; D. in Andorra/Tanzania
Bathsheba N=892, Kenya 636, Papua New Guinea 93, Indonesia 86, Nigeria 14, Cameroon 13, Philippines 11, India 10	D. in Kenya/ Israel
Zesiro, N=2, Turkey 1, Uganda 1;	D. in Uganda/Uganda
Negasi N=13,666, Ethiopia 13,542,	D. in Ethiopia/Ethiopia
Alimayu N=232, Indonesia 195, USA 33, Trinidad and Tobago 3	D. in Trinidad and Tobago/Barbados
Selassie N=23,336, Ethiopia 20,113, Ghana 3034, USA 65	Ethiopia ; D. in Bermuda/Ethiopia
Zenebe N=164,617, Ethiopia 164,023, Kyrgyzstan 481, USA 69, Canada 5	D. in Ethiopia/Ethiopia
Akosua N=32,690, Ghana 31,127, USA 618, England 517	Ghana (2); D. in Ghana/Ghana
Kadida N=448, Nigeria 245, Tanzania 99, Niger 43, Uganda 20, Philippines 11	Nigeria , Tanzania ; D. in Tunisia/Niger
Djimon N=1, USA 1	Djimo: Mozambique

Diarra N=46,345, Senegal 24,281, Ivory Coast 9960, Mali 3866, Burkina Faso 3347	Mali(2), Ivory Coast ; D. in Mali & Mauritania / Senegal
32 name families and 32 names (18 long, 14 short, 0 very short)	
Nyala N=1442, India 667, Indonesia 192, Malaysia 125, Tanzania 102, UAE 101	Sudan(2), Tanzania, Zambia, Zimbabwe ; D. in Malaysia & Malawi / Saint V. & the Grenadines & UAE
Mazaa N=13, Australia 2, India 2, Nigeria 2, UAE 2	D. in Egypt / UAE
Neela N=35,690, India 25,575, Bangladesh 4307, USA 1009, South Africa 1009, Sri Lanka 1002, England 384	Pakistan, India ; D. in Maldives & Bangladesh / Trinidad and Tobago & Sri Lanka;
Abena N=104,974, India 58,934, Ghana 38,937, Ivory Coast 3291, USA 954	Spain , Chad(2), Gabon , Ethiopia (3), Indonesia ; D. in Cameroon & Ghana / Ghana & Ivory Coast
Amara N=428,167, India 86,798, Syria 76,123, Guinea 48,971, Sierra Leone 30,603, Nepal, 29,176, Ivory Coast 27,712	Iraq(2), Ethiopia, Romania(2), Iran , Turkey(2), Syria , Sudan (5), Morocco (2), Ukraine, Armenia, Mali, Spain, Mauritania, Niger, India ; D. In Sierra L. & Algeria / Sierra L., Guinea, Syria, Ivory Coast, Nepal
Anika N=221,390, Bangladesh 180,818, Germany 10,312, India 6366, USA 4656, Indonesia 4182	China(3), Ethiopia (2), UAE ; D. in Bangladesh & Togo / Bangladesh & Grenada
Izara N=232, Brazil 81, Niger 46, Spain 45, India 9	Spain(2), Germany, Madagascar ; D. in Spain / Saint V. and the Grenadines, Niger
Kaleb N=19,575, Brazil 4335, USA 4021, Ethiopia 3930, Indonesia 2308, DR Congo 876	Indonesia (2), Tibet ; D. in Namibia & Croatia / Namibia & Ethiopia
Panya N=86,057, Thailand 83,970, India 600, Russia 421, USA 269	Myanmar(2), Corded Ware Russia, South Korea, Nigeria, Ghana, Ivory Coast ; D. in Thailand / Thailand
Ajani N=11,486, Nigeria 7227, India 3232, Sri Lanka 429, USA 251, Indonesia 108	Nigeria , India(3), Bosnia and Herzegovina ; D. in Nigeria / Antigua and Barbuda / Nigeria
Amari N=50,568, India 42,555, Indonesia 2996, Ivory Coast 1885, Algeria 656, USA 635	Greece(2), Estonia, Nepal, Yemen , India(18); D. in Algeria & Libya / Ivory Coast & India
Gyasi N=13,278, India 9930, Ghana 3034, USA 204	Ghana ; D. in Ghana / Ghana
Negus N=1707, Ethiopia 1271, Indonesia 103, Israel 83, DR Congo 62, USA 52	D. in Ethiopia & England / Grenada & Ethiopia
Genet N=67,385, Ethiopia 63,344, USA 1589, Haiti 367, Saudi Arabia 233	Ethiopia(3), France(3), Italy ; D. in Ethiopia and French Polynesia / Ethiopia & Haiti
Very short names (none)	

Appendix table 18: Regional summary of the appearance of ancient Ethiopian names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	0	1	1	0	9	9	0	10	10
Corded Ware Europe	0	0	0	0	1	1	0	1	1
Kurgan Europe	0	0	0	0	3	3	0	3	3
Balkans	0	3	3	0	2	2	0	5	5
Middle East	0	1	1	0	8	8	0	9	9
Central and Northern Asia	0	1	1	0	0	0	0	1	1
Gedrosia	0	0	0	0	2	2	0	2	2
India, Nepal, Sri Lanka	4	12	16	5	24	29	9	36	45
Indochina	0	0	0	2	3	5	2	3	5
Sundaland	1	0	1	1	3	4	2	3	5
China etc.	0	0	0	0	3	3	0	3	3
Japan and Koreas	0	0	0	0	1	1	0	1	1
East Africa	7	7	14	2	16	18	9	23	32
Maghreb	0	0	0	1	3	4	1	3	4
West Africa	3	8	11	1	7	8	4	15	19
Central and South Africa	0	2	2	0	3	3	0	5	5
Greece and Egypt	0	0	0	0	2	2	0	2	2

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Appendix table 19: Geographic distribution of Hyksos names

Name family	Anthroponyms	Place names
Abisha	Abisha N=89, DR Congo 21, India 17, Israel 14, Nigeria 12, Botswana 4, Egypt 4; forename N=6046, Zimbabwe 3172, Nigeria 2182, India 374, DR Congo 48, Russia 47	Abishān (locality, India), Abishan (grove, Iran); D. in Botswana/Zimbabwe
	Apisha N=9, Indonesia 4, India 2, France 1, Nigeria 1, Uganda 1; fname N=27, India 18, Thailand 4, Cameroon 1, DR Congo 1, Russia 1, Sweden 1, Trinidad and Tobago 1	D. in Indonesia/Trinidad and Tobago
Apophis	Apophis, N=0; forename Hong Kong 1/1	D. in nil/Hong Kong
	Apofis N=6, Russia 3, Belarus 1, Germany 1, Romania 1; forename N=7589, Uganda 7542, Rwanda 36	D. in nil/Belarus
Chayan	Chayan N=3888, Bangladesh 2794, Iran 189, India 177; forename N=30,436, Bangladesh 12,006, India 9711; Thailand 4547, Russia 3268	Chayan (village, Kazakhstan), Chayan (locality, Uzbekistan), Chayan (hamlet, Iran), Chayan (village, Iran), Chayan (locality, Spain), Chayan (locality, Zuniy, China), Chayan (locality, Hechi, China), Chayan (locality, Fujian, China), Chayan (locality, Liuzhou, China), Chayanshan (peak, Taiwan); D. in Bangladesh/ Bangladesh
	Chayani N=3632, India 2001, Algeria 771, Iran 469, Indonesia 321; forename N=1547, India 579, Thailand 505, Sri Lanka 286	D. in Algeria/Sri Lanka
	Khayan N=1497, Thailand 903, Mongolia 168, Russia 115, Indonesia 62, Iran 49, Belarus 34, India 30, Armenia 27, USA 24, Afghanistan 23; fname N=1317, Thailand 791, Indonesia 303, India 66, Brazil 56, Pakistan 29	Khayan (hamlet, Russia), Khayan (locality, Iran), Khayan/Khian (locality, Pakistan), Khayan (peak, China); D. in Mongolia/Thailand
Chayran	Chayran N=23, Russia 17, India 5; forename N=10, India 8, Kazakhstan 1;	D. in Russia/Kazakhstan
	Khayran N=272, Morocco 239, India 20, Afghanistan 4, Kenya 2; fname N=1631, India 1596, Afghanistan 13, Indonesia 5, Brazil 4, Pakistan 4	D. in Morocco/Tunisia
	Chayrani N=0, forename N=36, Indonesia 29, India 7	D. in nil/Indonesia
Khamudi	Khamudi N=4, Russia 2, Algeria 1, Egypt 1; forename N=38, India 21, Indonesia 7, Russia 7, Israel 3	D. in Algeria/Israel
	Chamudi India 9/9; fname N=9, India 55, Indonesia 11, Sri Lanka 9, England 1, Niger 1, South Africa 1	Chamudie (locality, Angola); D. in India/Sri Lanka
	Khamud N=51, Russia 12, Ukraine 12, Iran 11, India 9, Thailand 5; forename N=20, Russia 6, Iran 5, Ukraine 5, India 2, Indonesia 2	Khamud/Odajo (locality, Ethiopia), Khamud (locality, Nepal); D. in Ukraine/Ukraine
Yanassi	Yanassi, Cameroon 18/18; forename N=0	D. in Cameroon/nil
	Janassi Malawi 1/1; fname N=7, India 5, Brazil 2	D. in Malawi/Brazil
	Yanasi N=119, Thailand 112, India 1, Zimbabwe 1, Papua New Guinea 1; Yanasi, forename N=34, India 15, Egypt 9, Nepal 3, Papua New Guinea 3	D. in Thailand/Papua NG
11 name families, 29 names (16 long, 12 short, 1 very short)		
Abisha	Abish N=1546, Kazakhstan 634, Yemen 288, Iraq 241, Egypt 153, USA 61, Iran 50; forename N=1371, India 376, Kazakhstan 247, Mexico 145, Georgia 131, Iran 123	Kazakhstan; D. in Falkland Islands/Georgia
	Apish N=227, Russia 217, Iran 6; fname N=77, India 63, Kyrgyzstan 12	D. in Russia/Kyrgyzstan
Chayan	Chaya N=11,524, India 3375, Algeria 1046, Thailand 1035, Zimbabwe 733, Japan 698; forename N=81,618, India 67,420, USA 5949, Sri Lanka 3148, Nepal 1458, Thailand 1000	Zhag'yab/Chaya(county, China), Choya/Chaya (locality, Russia), Chayan (village, Kazakhstan), Yanduo/Chaya (locality, China), Chaya (town, Sichuan, China), Charix/Chaya (locality, Iraq), Chaya (quarter, Japan), Chaya (hamlet, Japan), Chayamachi (quarter, Japan); D. in Zimbabwe/Sri Lanka
	Khaya N=5394, India 1726, Morocco 1670, Iraq 419, Senegal 383, Malawi 366, Thailand 251, DR Congo 103; fname N=8137, South Africa 5591, India 965, Swaziland 461, USA 362, Afghanistan 167, Russia 88, Mauritania 85, Pakistan 84, Uzbekistan 78	Khaya (suburb, South Africa), Khaya (hamlet, Mauritania), Khayat (locality, Morocco), Khaya (abandoned locality, Russia), Khaya (locality, Russia), Kyzyl-Khaya (village, Russia), Dzhebariki-Khaya (village, Russia), Hayaa/Khaya (locality, Mongolia), Khei/Khaya (locality, Pakistan), Khiya/Khaya (locality, Pakistan); D. in Morocco/Swaziland
Sekmem	Sekme N=195 Turkey 195/195; forename N=18, India 15, Indonesia 1, Malaysia 1, Turkey 1	D. in Turkey/Malaysia
	Secme N=14, Switzerland 8, Germany 4, China 1, Mexico 1; fname N=25, Turkey 24, Germany 1	Seçme (village, Turkey); D. in Switzerland/Turkey
Apepi	Apepi N=5, Philippines 4, Nigeria 1	D. in Philippines/nil
	Apebi N= 13, India 6, Nigeria 6, Morocco 1; fname N=19, Burkina Faso 12, Nigeria 5, India 1	D. in Nigeria/Burkina Faso
	Apepiu, forename, Burkina Faso 69/69	D. in nil/Burkina Faso
Sakir-Har	Sakir N=16,311, India 10,198, Bangladesh 2523, Indonesia 2442, Pakistan 173, Mauritius 132, Malaysia 90, USA 81; forename N=73,915, India 56,555, Indonesia 7232, Bangladesh 4949, Nepal 1870, Saudi Arabia 1515, Germany 300	Shakirovka/ Šakir (village, Russia), Sakirköy/Sakir (village, Turkey), Sakir (locality, Turkey), Sakir (mountain, Pakistan), Sakir (area, Yemen), Sakir (locality, Indonesia); ; D. in Mauritius/Suriname
	Saqir N=127, Nigeria 46, India 30, Pakistan 19, UAE 8; fname N=711, Georgia 232, Nigeria 220, Pakistan 163, India 82, Azerbaijan 4	D. in UAE/Georgia
	Sakirha, N=0; forename N=4, Nigeria 3, India 1	D. in nil/Nigeria
Very short names		
Sakir-Har	Har N=17,511, India 4001, Indonesia 2138, Myanmar 1983, Malaysia 1930, Pakistan 1740, Iran 933, USA 610, Morocco 477; forename N=99,602, India 86,664, Pakistan 5089, Indonesia 1936, Iran 1179	Oman, Pakistan(3), Indonesia, India(13), Ethiopia, Somalia, Morocco_USA, Germany, Denmark; D. in Brunei/India

Appendix table 20: Regional summary of the appearance of Hyksos names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	0	1	1	1	0	1	1	1	2
Corded Ware Europe	4	0	4	1	0	1	5	0	5
Kurgan Europe	1	0	1	0	0	0	1	0	1
Balkans	0	0	0	0	0	0	0	0	0
Middle East	0	0	0	3	4	7	3	4	7
Central and Northern Asia	0	2	2	1	6	7	1	9	10
Gedrosia	0	5	5	0	3	3	0	8	8
India, Nepal, Sri Lanka	10	2	12	9	0	9	19	2	21
Indochina	4	0	4	0	0	0	4	0	4
Sundaland	2	0	2	1	1	2	3	1	4
China etc.	1	6	7	0	3	3	1	9	10
Japan and Koreas	0	0	0	0	3	3	0	3	3
East Africa	1	1	2	0	0	0	1	1	2
Maghreb	1	0	1	0	2	2	1	2	3
West Africa	1	0	1	5	0	5	6	0	6
Central and South Africa	3	1	4	1	1	2	4	2	6
Greece and Egypt	0	0	0	0	0	0	0	0	0

Appendix table 21: Geographical distribution of Kushite names

	Anthroponyms	Places and highest densities/frequencies
Atakhe-basken	Atakhe N=0, forename India 1/1	D. in India/India
	Basken N=166, USA 111, Canada 28, Norway 8, Germany 6, India 5, Russia 3; forename N=6, Indonesia 3, Russia 2, Kazakhstan 1	Basken (island, Norway); D. in Norway/Kazakhstan
	Baskeni N=0; fname Indonesia 1/1	D. in nil/Indonesia
	Kasaqa N=0, forename Fiji 1/1	D. in nil/Fiji
Kasaqa	Kasaka N=5411, DR Congo 2634, Zambia 2109, Uganda 325, Japan 85; fname N=454: DR Congo 233, Tanzania 184, India 13, Zambia 13	Kasaka (village, Tanzania), Kasaka (village, Tanzania), Kasaka (village, Indonesia), Kashaka (village, Uganda), Kasaka (village, DR Congo), Kasaka (village, DR Congo), Kasaka (village, Tanzania); D. in Tanzania/Zambia
	Kashta N=628, India 226, Egypt 214, Albania 115, Russia 22, Ukraine 21, UAE 11; forename N=1568, India 1519, Afghanistan 33	D. in Albania /Trinidad and Tobago
Kashta	Qashta N=189, Egypt 183, Syria 4; Fname N=0	D. in Egypt /nil
	Khensa N=0, forename N=12, USA 5, South Africa 3, India 2, Algeria 1, Papua NG 1; forename N=12, USA 5, South Africa 3, India 2	Khensa (locality, India); D. in Papua NG/Papua NG
	Khensan N=0; fname N=10, India 4, South Africa 4, Singapore 1, Ukraine 1	D. in nil/Singapore
Mesbat	Mesbat Algeria 71/71, forename N=12, Indonesia 12/12	D. in Algeria/Indonesia
	Mesbate Algeria 1/1; fname N=0	D. in Algeria/nil
Naparaye	Naparayan India 10/10; forename India 18/18	D. in India/India
	Nabaraya N=11, Nigeria 10, Niger 1; fname Nigeria 7/7	Nabaray (stream, Sudan); D. in Nigeria /Nigeria
	Nabaray N=0; fname N=12, India 11, England 1	D. in nil/England
Piankhi	Piankhi N=11, USA 6, Trinidad and Tobago 4, Uganda 1; forename N=15, USA 9, England 2, Haiti 2, India 1, Trinidad and Tobago 1	D. in Trinidad & Tobago / Trinidad & Tobago
	Pianki N=51, USA 50, India 1; fname N=487, India 480, Bangladesh 4, England 1, Jamaica 1, Trinidad & Tobago 1	Pianki (Village, Poland), Pianki (village, Poland), Pianki (village, Poland), Pianki (village, Poland), Pianki (hamlet, Belarus); D. in USA/Trinidad and Tobago
	Piankhae N=0; fname Thailand 1/1	D. in nil/Thailand
	Qalhat N=65, Lebanon 64, Oman 1; forename N=0	Qalhat (archaeological, Oman), Qalhat (village, Lebanon); D. in Lebanon
Qalhata	Kalhat N=31, Argentina 18, India 13; fname N=16, India 15, Sweden 1	Ḥulayyāt/Kalhat (mountain, Oman), Kalhatti (locality, India), Kalhatti (interm.stream, India), Kālhatti (interm.stream, India), Kalhatti (waterfall, India), Kalhatha (locality, India); D. in Argentina /Sweden
	Kalhatan N=0; fname India 1/1	D. in nil/India
Shebitku	Shebitko Russia 12/12; forename N=0	D. in Russia /nil
	Shepitko N=567, Russia 533, Moldova 11; fname N=0	D. in Transnistria /nil
Shabaka	Shabaka N=3006, Egypt 2197, Lebanon 343, Saudi Arabia 278, Palestine 45; forename N=180, USA 84, Kuwait 28, England 22, India 15	Shabaka (village, Tanzania), Shabakat (peak, Algeria), Shabaka (village, Somalia), Shabakah (peak, Yemen), Shabakat (locality, Sudan), Shabakat (hill, Tunisia); D. in Lebanon/Grenada
	Shabak N=685, Jordan 169, Palestine 133, Iraq 126, Ukraine 65, Iran 65; fname N=72, India 34, Pakistan 12, Iran 7, Iraq 4, Syria 4, Afghanistan 3, USA 3	Shābak (locality, Pakistan), Shabak (locality, Syria), Shabak (locality, Pakistan), Shabakiyah (village, Yemen); D. in Palestine
	Shabako N=366, Nigeria 364, Kazakhstan 1, South Africa 1; fname N=191 Nigeria 188	D. in Nigeria/Nigeria

Taharqa	Taharqa N=0; forename N=30, USA 23, Sudan 4, England 1, South Africa 1;	D. in Nil/Trinidad and Tobago
	Taharka USA 10/10; fname N=30, USA 23, England 2, India 2	D. in USA/Guyana
	Daharka N=0; fname N=2, India 1, Niger 1	D. in nil/ Niger
Tantamani	Tantamani N=0; forename, India 10/10	Tantamanni (islet, Sweden), D. in nil/India
	Tantaman N=0; fname N=2, India 1, Papua NG 1	Tantaman (locality, Indonesia), D. in nil/ Papua NG
	Tantamana DR Congo 1/1; fname DR Congo 1/1	D. in DR Congo /DR Congo
Tabiry	Tabiry France 2/2; forename N=0	D. in France/nil
	Tabiri N=6722, Ghana 6442, USA 56, UAE 50; fname N=852, Ghana 787, Indonesia 12, USA 10, Benin 9, Ivory Coast 8, India 7	Bandar Siraf/Tabiri (town, Iran), Tabiribo (locality, Papua NG), Tabiriang (locality, Indonesia), Tabiri(locality, Ghana), Tabirin (locality, Libya), Tabiri(locality, Ghana), Tabirikurom (locality, Ghana) Tabiriou (valley, Chad), Tabiria (stream, DR Congo), Tabirikrom(Ghana), Tabirikurom (locality, Ghana), Tabirikurom(locality, Ghana); D. In Ghana/Ghana
	Kastha N=259, India 250, Australia 7, China 1, Malaysia 1; forename N=37, India 31, Tanzania 1, Malaysia 1, Americas (rest)	Kastha (locality, Bangladesh), Kastha (locality, India); D. in India/Nicaragua
Nefruke-kastha	Castha N=0; fname Nicaragua 3/3	D. in nil/Nicaragua
	17 name families and 42 names (30 long, 6 short, 5 very short)	
Alara	Alara N=1147, Nigeria 426, Cameroon 311, India 199; forename N=1148, Turkey 518, India 304, Nigeria 61	Ulugüney/Alara (village, Turkey), Alara (historical, Turkey), Alaraz (locality, Spain), Al' Ará (locality, Syria), ALARA (village, Kenya), Alara (village, Kenya), Alara (locality, Kenya), D. in Cameroon/Turkey
Atakhe-basken	Ataqh N=0, fname Pakistan 6/6	D. in nil/Pakistan
Kurru	Kurru N=1911, India 1837, Finland 48, Indonesia 12, Papua NG 8, USA 2; forename N=117, India 114, DR Congo 1, Finland 1, Papua NG 1	Kurru (locality, Afghanistan), Kurru (locality, India), Kurru (locality, India), El-Kurru (archaeological, Sudan), Kurru (hamlet, Sudan), Kurru (hamlet, Sudan), Kurru (area, Kenya), D. in Finland/Finland
	Curru N=5, Spain 2, USA 2, France 1; fname N=21, India 13, Taiwan 3	Curru (Spain), D. in Spain /Panama
	Qurru Kenya 1/1; fname N=0	D. in Kenya/nil
Kerma	Kerma N=1134, Algeria 797, Morocco 136, Estonia 38, India 4; forename N=740 Liberia 194, Americas (many), Indonesia 71, India 49, Philippines 45, Algeria 36	Kerma (city, Sudan), Kerman (city, Iran), Karmah/Kerma (village, Sudan), Kermanshah (city, Iran), Kerma (village, Nigeria), Shahrestān-e Kermānshāh (city, Iran), Kerma (hamlet, Finland), Kerma (locality, India), Kerma (archaeological, Sudan), Kermaria-Sulard (village, France), Kermario (archaeological, France), Kerma (stream, Djibouti), Kerma (well, Morocco); D. in Estonia /Saint Lucia
	Cerma N=72, Greece 27, USA 17, Italy 9, Albania 4, Brazil 4; fname N=80, Philippines 27, Indonesia 19, Brazil 7	Ilisu/Cerma (village, Turkey), Çerma (locality, Albania); D. in Greece/
	Kermani N=21,494, Iran 20,093, USA 539, Algeria 239, Israel 98, India 98; fname N=536, Iran 508, USA 9, India 5	Kermani (village, Iran), Kermani (locality, Iran); D. in Iran/Iran
Very short names		
Abar	Abar N=14,592, Syria 3140, Iraq 2568, Iran 1996, Yemen 1859, Philippines 1148; forename 4435, Iraq 734, Indonesia 720, Iran 690, India 621, Afghanistan 596, Pakistan 257, Kuwait 256	D. in Djibouti/Kuwait
Nuri	Nuri 69,029, Ethiopia 36,864, Bangladesh 9012, Indonesia 6958, Libya 5109, India 3708; forename N=259,486, Turkey 87,065, Ethiopia 55,368, India 33,944, Indonesia 31,130, Libya 24,788, Bangladesh 6507	Sudan(2), Iran(5), Estonia, Egypt, Tibet(4), Mexico, Afghanistan(2), Panama, Pakistan(4), Japan , India, Ethiopia; D. in Libya/Libya
Arty	Arty N=400, Indonesia 144, Kuwait 77, France 69, Haiti 67, Nigeria 20, India 5; forename N=1940, USA 670, Indonesia 528, India 250, Russia 89	France(2), Philippines; D. in Kuwait / Marshall Islands
Piye	Piye N=130, Papua New Guinea 47; Congo 34, Nigeria 24, India 19; forename N=218, Indonesia 89, Nigeria 30, Taiwan 26, Papua New Guinea 24, India 19	DR Congo(2); D. in Papua NG / Papua NG
Kush	Kush N=14,091, India 7493, Jordan 2285, Ukraine 568; forename N=44,149, India 41,742, Sri Lanka 787	Turkey, Kazakhstan, India, Pakistan; D. in Jordan/Bhutan
	Cusha N=13, South Africa 11, India 1;N=92, India 84, USA 3, South Africa 1	D. in South Africa/India

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Appendix table 22: Regional summary of the appearance of Kushite names

Region	Long names			5 letter names			Total		
	Mode	Places	Total	Mode	Places	Total	Mode	Places	Total
Bell Beaker Europe	3	0	3	1	4	5	4	4	8
Corded Ware Europe	2	7	9	0	1	1	2	8	10
Kurgan Europe	0	0	0	0	0	0	0	0	0
Balkans	0	0	0	1	0	1	1	0	1
Middle East	5	6	11	1	4	5	6	10	16
Central and Northern Asia	0	0	0	0	0	0	0	0	0
Gedrosia	0	3	3	3	6	9	3	9	12
India, Nepal, Sri Lanka	15	7	22	3	3	6	18	10	28
Indochina	1	1	2	0	0	0	1	1	2
Sundaland	3	3	6	0	0	0	3	3	6
China etc.	0	0	0	0	0	0	0	0	0
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	1	8	9	1	11	12	2	19	21
Maghreb	2	3	5	1	1	2	3	4	7
West Africa	5	6	11	2	1	7	7	7	14
Central and South Africa	5	3	8	0	0	0	5	3	8
Greece and Egypt	2	0	2	1	0	1	3	0	3

Appendix table 23: Geographical distribution of Archaeological West African names

	Forenames	Places
Asantemanso	Asante N=191,242, Ghana 185,648, USA 1863; fname N= Ghana 22,087, Tanzania 4758, Malawi 4125	Togo, Ghana; D. in Ghana/Ghana
	Asande N=1092, Kenya 734, Philippines 119, Nigeria 103, Cameroon 103, DR Congo 41, Uganda 21, Papua NG 18; fname N=475, DR Congo 151, Swaziland 128, Nigeria 83, Kenya 52, South Africa 41	Asande (locality, Nigeria), Asandewadi (India); D. in Kenya/Swaziland
Aborney	Aborney N=0; South Africa	D. in nil/South Africa
Allada	Allada N=10,249, India 9076, Philippines 979, USA 110, Qatar 28; fname N=909, India 871, Thailand 7	Allada(city, Benin), Allada(village, India), Allada/Vallada(locality, India), Alla Da (area, Pakistan), Allada (Benin), Alladapalem(village, India), Allada(locality, Benin), Alladapeta(locality, India); D. in Qatar/Qatar
	Allata N=212, Philippines 166, France 13, Algeria 8; fname N=324, Chad 309, India 4, Niger 3, Cameroon 2	Allata (locality, Ethiopia); D. in Philippines/Chad
Adansemanso	Adanse N=878, Ghana 762; fname Ivory Coast	Ghana (2); D. in Ghana/Saint Vincent and the Grenadines
	Atanse Nigeria 4/4; fname N=2, DR Congo 1, Nigeria 1	D. in Nigeria/DR Congo
Akrokrowa	Akrokro N=0; fname India 1/1	Ivory Coast; D. in nil/India
Azelik	Azelik N=0, forename N=0	Niger (8);
	Azelika N=0; fname Indonesia	D. in nil/Indonesia
Eguefo	Eguef N=2, Mauritania 1, Niger 1; fname Mauritania	Mali (2), Niger; D. in Mauritania/nil
	Ekuefi Nigeria 2/2; fname N=0	
Gourma	Gourma N=1651, Morocco; fname Benin	Burkina Faso (2), Mali, Ghana; D. in Benin/Benin
	Kourma N=6768, Niger 6625, Senegal 92, Cameroon 20, Benin 11, Burkina Faso 5; fname N=1557, Niger 1486, Burkina Faso 43, Cameroon 19, Benin 6, Ivory Coast 2	Kourma (village, Chad), Courma (village, Chad), I-n-Kourma (mountain, Mali), Rijial Kourma (village, Niger); D. in Niger/Niger
Kumasi	Kumasi N=3342, Ghana 2078; fname Nigeria	Ghana (8); D. in Ghana/Papua NG
	Gumasi N=12, India 10, Papua NG 1, Uganda 1; fname N=8, India 6, England 1, Malaysia 1	Urasi/Gumasi (island, Papua NG), Gumasiir (mountain, Ethiopia), D. In Papua NG/Malaysia
Koumbi	Koumbi N=603, Gabon 556, Congo 18; fname N=68, Burkina Faso	Mali, Greece (2), Central African Republic, Ivory Coast, Guinea; D. in Gabon/Burkina Faso
	Goumbi N=1707, Niger 1513, Benin 153, Cameroon 37; fname N=163, Niger 124, Benin 33, Cameroon 3	Goumbi (village, Niger), Goumbi Banda (village, Niger), Amberi Goumbi (locality, Benin), Goumbi (village, Mali), Goumbi (locality, Republic of Congo); D. in Niger/Niger
Kolima	Kolima N=126, Nigeria+Liberia 30, Papua New Guinea 22, DR Congo 21, India 13, Finland 11, Liberia 8; fname N=292, India 177, Ivory Coast 56, Indonesia 28, USA 7	Asian Russia, Sierra Leone, Finland (2), Ivory Coast, Thailand, Mali, Guinea; D. in Papua NG/Ivory Coast
	Golima N=56, Papua NG 18, India 16, Nigeria 16; fname N=62, Nigeria 29, India 23, Ivory Coast 2, Malaysia 2, Philippines 2	Golima (Hamlet, Ethiopia), Golima (Hamlet, Ethiopia); D. in Papua NG/D. in Nigeria
Osogbo	Osogbo Nigeria 107/107; fname Nigeria 5/5	D. in Nigeria/Nigeria
	Osogbon Nigeria 45/45	D. in Nigeria/nil
Rharous	Rharouss Morocco 4/4; USA 2, Morocco 1	Oued Rharous (wadi, Niger); Rharous-n-Hodos (well, Niger)
	Rarous N=0; fname Zimbabwe 1/1	Rarous(well, Mali), Tikikitene/Rarous(well, Niger), Gharous/Rarous(well, Mali), Rharous(well, Niger), Rarous(well, Mali)
Sorotorno	Sorotor N=0; fname Cambodia	D. in nil/Cambodia
Tichitt	Tichitt Mauritania 50/50; fname Mauritania 1/1	Mauritania (2); D. in Mauritania/Mauritania
	Tikhita N=0; fname India 4/4	D. in nil/India
Timbuktu	Timbuktu N=0; USA 4, Indonesia 1	Mali; D. in nil/USA
Walatta	Walatta Uganda 6/6; fname England	D. in Uganda/Trinidad and Tobago

	Walata N=467, Malawi 314, Philippines 55, USA 25, Poland 19, Mauritania 16, Nigeria 11, Zimbabwe 10; fname N=88, Afghanistan 36, Cameroon 14, England 10, Nigeria 10, USA 7	Oualata/Walata(city, Mauritania), Wa Lafa/Walata (stream, Indonesia), Walatalawa (locality, Sri Lanka); D. in Malawi/Iceland
Total 28 name families and 39 names (30 long names, 9 short names)		
Begho	Begho N=148, Nigeria 81, England 22; fname N=37, Pakistan 27, England 4, Nigeria 4, DR Congo 1, India 1	Belgium ; Papua NG & Nigeria / Pakistan & England
Benin	Benin N=7600, Ghana 1247, Burkina Faso 1067, India 912; fname N=16,170, India 9391, Afghanistan 2274, Ethiopia 1965	Nigeria(2), Turkey , Belarus , Ghana , Ivory Coast ; D. in Burkina Faso / Afghanistan
Ijebu-Ode	Ijebu N=1574, Nigeria ; fname Nigeria	Nigeria(2); D. in Nigeria / Nigeria
Kissi	Kissi N=24,902, Ghana ; fname Ivory coast	Greece , Ghana , Sierra Leone , Cameroon , Guinea , Central African Republic , Burkina Faso , Republic of the Congo , South Sudan , Cyprus ; D. in Ghana/Ivory Coast
Niani	Niani N=288, DR Congo 75, Indonesia 74, Paksitan 51, Papua NB, 25, Ivory Coast 17, Cameroon 15, Iran 14; fname N=970, Pakistan 415, Mali 276, Indonesia 126	Gambia , Mali(4), Ivory Coast , DR Congo , Senegal , Tibet ; D. in Papua NG & Congo / Mali & Pakistan
Manso	Manso N=37,601, Spain 8716, Brazil, Cuba, Portugal 4020, Ghana 3394; fname N=4300, India 2008, Ghana 787, Pakistan 546, Ivory Coast 330	France (4), Ghana (8), Chad (2), Somalia , Ethiopia , Spain , Cameroon , Portugal ; D. in Portugal / Ghana
Notse	Notse N=11, South Africa ; fname South Africa	Togo ; D. in South Africa / Cameroon & South Africa
Saleh	Saleh N=2,685,229, Yemen ; fname Yemen	Iran (6), Libya , Egypt , Pakistan (6), DR Congo ; D. In Yemen / Yemen
Tegdaoust	Tegda N=98, Hungary ; fname Mauritania 1/1	Asian Russia(3); D. in Hungary / Mauritania
Very short names (none)		

Appendix table 24: Regional summary of the appearance of Archeological West African names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	1	0	1	2	7	9	3	7	10
Corded Ware Europe	0	2	2	0	1	1	0	3	3
Kurgan Europe	0	0	0	1	0	1	1	0	1
Balkans	0	2	2	0	1	1	0	3	3
Middle East	0	0	0	2	3	5	2	3	5
Central and Northern Asia	0	1	1	0	3	3	1	3	4
Gedrosia	1	1	2	2	12	14	3	13	16
India, Nepal, Sri Lanka	7	6	13	2	0	2	9	6	15
Indochina	1	1	2	0	1	1	1	2	3
Sundaland	4	2	6	0	0	0	4	2	6
China etc.	0	0	0	0	0	0	0	0	0
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	2	4	6	0	3	3	2	7	9
Maghreb	5	3	8	1	1	2	6	5	11
West Africa	20	53	73	6	29	35	26	82	108
Central and South Africa	5	2	7	3	4	7	8	6	14
Greece and Egypt	0	2	2	0	2	2	0	4	4

Appendix table 25: Geographical distribution of Fulani names

Forenames	Places
Aashif N=2545, India 2083, Sri Lanka 429, Pakistan 13, Canada 10, Nepal 2, Bangladesh 1, Germany 1, Italy 1	D. in Sri Lanka & India
Aashir N=602, Pakistan 480, India 71, USA 25, UAE 11, England 3, China 2, South Africa 2, Thailand 2	D. in Pakistan
Arzika N=9488, Nigeria 3838, Benin 33	Niger ; D. in Nigeria
Abarshi N=1054, Nigeria 1053, Czechia 1	D. in Nigeria
Babangida N=150,916, Nigeria 150,497, Ghana 225, Cameroon 82	Nigeria (3); D. in Nigeria
Bakwai N=1094, Nigeria 1067, Niger 26, South Africa 1	Nigeria ; D. in Nigeria
Balarabe N=47,461, Nigeria 47,020, Cameroon 218, Niger 205	Nigeria (2), Niger ; D. in Nigeria
Dandawo N=72, Nigeria 71, Ethiopia 1	Niger ; D. in Nigeria
Dangali N=591, India 372, Niger 104, Nepal 101, Nigeria 8	Pakistan (2), Niger (3), Nepal , DRC (2), Uganda ; D. Niger & Nepal
Danjuma N=138,163, Nigeria 138,009, Cameroon 61	Nigeria (6), Sierra Leone ; D. in Nigeria
Danladi N=137,532, Nigeria 134,847, Cameroon 1430, Ghana 955	Nigeria (5); D. in Nigeria
Danlami N=59,963, Nigeria 59,903, Cameroon 33, Niger 5	Nigeria ; D. in Nigeria
Faiqah N=2532, Pakistan 2058, Malaysia 264, Indonesia 161	D. in Pakistan & Malaysia
Hankurau Nigeria 1/1	D. in Nigeria
Ismaila N=219,732, Nigeria 138,697, Senegal 22,417, Gambia 14,456, Cameroon 14,039, Guinea 5720	Pakistan (3), India (7), Cameroon (4); D. in Gambia
Jariri N=502, Nigeria 431, Niger 40, Indonesia 25, India 3	Niger ; D. in Nigeria

Karami N=32,506, India 27,195, Iran 3399, Niger 690, Nigeria 610, Morocco 246, Benin 165, Nepal 40, Afghanistan 30	Baluchestan, Iran, India(2), Central African Republic, Indonesia, Niger ; D. in Iran & Niger
Kadade N=913, Niger 852, Nigeria 39, India 12, DR Congo 4	Nigeria ; D. in Niger
Kokari N=1041, Niger 792, Nigeria 122, India 92, Benin 14, Nepal 12, Papua NG 7, Cameroon 2	Greece, Afghanistan, South Korea, Pakistan, Latvia, India, Ivory Coast ; D. in Niger & Papua NG
Mansurah N=1267, Nigeria 506, Bangladesh 458, Pakistan 233, Indonesia 45, Malaysia 4	Egypt, Israel(2), Libya, Syria, Yemen(4), India ; D. in Bangladesh & Nigeria
Maidawa N=3852, Nigeria 2808, Cameroon 550, Niger 489	Niger(4) ; D. in Nigeria
Maigero N=399, Nigeria 396, Niger 2	Nigeria ; D. in Nigeria
Maiwake N=287, Nigeria 210, Niger 76, Cameroon 1	D. in Nigeria
Shekarau Nigeria 1810/1810	D. in Nigeria
Shibkau Nigeria 112/112	D. in Nigeria
Maifari N=18, Nigeria 15, Cameroon 1, India 1, Niger 1	Nigeria ; D. in Nigeria
Maihwari Nigeria 1/1	D. in Nigeria
Maikasuwa Nigeria 2698/2698	Nigeria ; D. in Nigeria
Maikudi N=17,139, Nigeria 17,070, India 41, Cameroon 11	Nigeria ; D. in Nigeria
Mailafiya Nigeria 631/631	D. in Nigeria
Mailahiya N=17, Nigeria 14, Niger 3	D. in Nigeria & Niger
Mushin N=447, India 321, Nigeria 24, US 23, Indonesia 20, Pakistan 18, Uganda 9	Nigeria(2), Iraq, Pakistan, Asian Russia ; D. In Qatar & India
Nagona N=370, Niger 199, Nigeria 91, Uganda 74, Cameroon 2, India 2; fname N=125, India 45, Nigeria 41, Indones 2, Papua NG 2	D. in Niger & Uganda / Nigeria & Papua NG
Nanoma N=47, Burkina Faso 39, India 3	Mozambique, Zambia ; D. in Burkina Faso
Nahantsi N=650, Nigeria 631, Niger 19	Nigeria ; D. in Nigeria
Nagoma N=157, Nigeria 139, Indonesia 7, Ivory Coast 6, India 1	Mozambique, Nigeria, Zimbabwe ; D. in Nigeria
Yakubu N=476,877, Nigeria 442,648, Ghana 25,733, Uganda 5099, Tanzania 2120, India 426	Nigeria(4) ; D in Nigeria & Ghana
Tanimu N=59,481, Nigeria 59,429, Cameroon 36	D. in Nigeria
Yarima N=14,738, Nigeria 10,663, Colombia 1385, Venezuela 1378, Niger 405	Nigeria ; D. in Nigeria
Yohance N=542, USA 301, Indonesia 122, Trinidad and Tobago 65, Guayana 16, England 10, Canada 9, Brazil 3, China 3, Grenada 2	D. in Trinidad & Tobago and Guyana
40 name families and 40 names (40 long, 0 short)	

Appendix table 26: Regional summary of the appearance of Fulani names

Region	Modes	Places	Total
Bell Beaker Europe	0	0	0
Corded Ware Europe	0	1	1
Kurgan Europe	0	0	0
Balkans	0	1	1
Middle East	0	9	9
Central and Northern Asia	0	1	1
Gedrosia	2	11	13
India, Nepal, Sri Lanka	5	11	16
Indochina	0	0	0
Sundaland	1	1	2
China etc.	0	1	1
Japan and Koreas	0	1	1
East Africa	0	1	1
Maghreb	0	1	1
West Africa	32	49	81
Central and South Africa	0	7	7
Greece and Egypt	0	1	1

In Appendix table 27, the highlighting of the rows shows the origin of the name:

Orange = Pliny the Elder [Nat. Hist. VI.8];

White = al Idrisi [Tabula Rogeriana], taken from the map section that is shown below:



Appendix table 27: Geographical distribution of Ancient West African names

	Anthroponyms:	Places
Aethiopia	Aethiops USA 1/1; forename N=0	D. in USA / nil
	Ethiopia N=46, Nigeria 43, England 1, Pakistan 1, Sweden 1; fname N=276, USA 151, Myanmar 25, Nigeria 22, Sweden 20, Qatar 20	Ethiopia ; D. in Nigeria / Qatar
Gymnetes	Gymnes N=0; forename Congo 1/1	D. in nil / Congo
	Kymnetta N=0; USA 2/2	
Pharusi	Pharusih N=0; forename India 1/1	D. in nil / India
	Pharusih N=0; forename India 1/1	D. in nil / India
	Pharusil N=0; forename India 1/1	D. in nil / India
	Farusi N=300, Indonesia 163, Italy 124, Nigeria 6; fname N=9, Indonesia 2, Uganda 2, DR Congo 1, India 1, Italy 1, Malaysia 1, Zimbabwe 1	Farusi(hamlet, Indonesia); D. in Italy/Zimbabwe
Garamantes	Garamante Italy 24/24; forename Burkina Faso 12/12	D. in Italy / Burkina Faso
	Garamanti N=0; fname N=2, India 1, Italy 1	D. in Italy
	Garama N=5694, Kenya 5030, India 172, Philippines 128, Cameroon 80, Papua New Guinea 71; forename N=1738, Kenya 1462, India 130, Philippines 40, DR Congo 34, Papua New Guinea 30, Niger 14, Cameroon 11, Egypt 4, Uganda 2	Libya , Yemen , Sierra Leone(4), Rwanda , Guinea ; D. In Kenya / Kenya & Papua NG
Trogodytae	Trogoditas N=0; forename USA 1/1	D. in nil / USA
	Trogodita N=0; forename Chile 1/1	D. in nil / Chile
	Trogodit N=0; forename N=3, Russia 2, Kazakhstan 1	D. in nil / Kazakhstan
Nigris	Nigris N=269, Italy 104, Argentina 47, France 42, Brazil 40; fname N=19, USA 10, India 5, Italy 4	Nigris(ancient river, Nigeria); D. in Monaco / Italy & India
	Nikris N=0; fname N=9, Indonesia 7, India 1, Venezuela 1	Nikris(locality, India), D. in nil/Venezuela
Tarraelian	Tarrae N=0; forename USA 9/9	Sardinia ; D. in nil / USA
	Darrael N=0; fname N=6, USA 4, Mexico 1, Venezuela 1	D. in USA
Cecalice	Cecali Brazil 1/1; forename N=9, Nepal 9, India 3, Nigeria 1	D. in Brazil / Nepal
Magium	Magioma Zimbabwe 1/1; forename N=0	D. in Zimbabwe / nil
	Magiumpa Philippines 1/1; forename N=0	D. in Philippines / nil
	Makium N=0; fname Malaysia 1/1	D. in nil/Malaysia
	Magiurna N=0; forename Nigeria 1/1	D. in nil / Nigeria
	Magius N=38; Denmark 28, Australia 2, Russia 2; fname N=17, Malaysia 7, Indones 6	D. in Denmark / Malaysia
Atlantis	Atlantis N=22, Cyprus 16, England 3, Brazil 1, Canada 1, Israel 1; fname N=173, USA 67, South Africa 13, UAE 12, India 7, Israel 7, Russia 5, Spain 4, Colombia 4, Morocco 4	Atlantis(town, South Africa), Atlantis(suburb, France), Atlantis (ancient island, “on the other side of Africa, at the same meridian as Carthage”, Equatorial Guinea); D. in Cyprus & Israel / Bahamas & UAE
	Atlantis Spain 1/1; fname USA 1/1	D. in Spain / nil
	Atlantis N=0; fname Bulgaria 1/1	D. in nil/ Bulgaria
	Atlantis N=0; fname South Africa 1/1 [Plin. Nat. Hist. VI.35]	D. in nil/South Africa
Atlantes	Atlante Italy 119, Argentina 109, France 13, Brazil 5, Spain 3; forename N=0	D. in Argentina & Italy / Italy & Chile
	Atlant India 1/1; forename N=0	D. in India/nil
	Adlante N=0; fname Russia 1/1	D. in nil/Russia
Satyri	Satyri England 1/1; forename N=0	D. in England / nil
	Satyrin Russia 3/3; forename N=0;	D. in Russia / nil
	Satyrina Russia 2/2; forename N=0	D. in Russia / nil
	Satyrio Brazil 29/29; forename Brazil 7/7	D. in Brazil / Brazil
	Satyrant N=17, India 13, UAE 4; forename India 1631/1631;	D. in UAE / India
Himantopodes	Himanto N=54, Indonesia 28, Finland 24; fname N=100, India 92, Nepal 7	D. in Finland / Nepal
	Himando Niger 10/10; fname N=100, India 92, Nepal 1, Indonesia 1	D. in Niger/Nepal
Aygylae	Aygyula N=0; fname N=19, Russia 15, Kazakhstan 1, Kyrgyztan 1, Romania 1, Turkmenistan 1	D. in nil / Turkmenistan
	Aygylae Kenia 4/4; forename N=0	D. in Kenya
Gamphasantes	Gampha India 1/1; forename India 5/5	D. in India / India

	Gamphani N=367, Malawi 366, Botswana 1; forename Zimbabwe 1/1	D. in Malawi / Zimbabwe
	Santes N=13,303, Mexico 12,807, USA 165, Philippines 91; forename N=580, India 528	D. in Mexico / India
Blemmyae	Blemmy N=0; forename N=2, India 1, Philippines 1	D. in nil / Philippines
Masure	Masure N=4176, India 1649, France 1307, Belgium 884, USA 181; forename N=103, India 29, Azerbaijan 25, Indonesia 25, Turkey 8, Nepal 7, DR Congo 4	Chad , India , Nepal(2); D. in Belgium & New Caledonia / Azerbaijan & Denmark
Barisa	Barisa N=3449, Kenya 3077, Latvia 103, Philippines 75, USA 33; forename N=2718, India 1701, Kenya 768, Nigeria 71, South Africa 47, Kyrgyzstan, Indonesia 21	Chad , Syria , India , Papua NG , Asian Russia; D. in Kenya & Latvia / Kenya & Kyrgyzstan
Makzara	Makzar N=2, Afghanistan 1, India 1; forename N=0	Nigeria ; D. in Afghanistan / nil
Tekrur	Tekrur N=0; forename Turkey 2/2	Chad ; D. in nil / Turkey
Halidat	Halidat Algeria 1/1; forename N=14, Nigeria 13, Uganda 1	Nigeria ; D. Algeria /
Drepanum	Drepani N=0; forename India 1/1	Cyprus , Greece ; D. in nil/India
	Trepanu N=0; fname India 1/1 (not included in statistics)	
Lepteacra	Lepten Nigeria 1/1; fname N=62 India 56, Nepal 4, Cameroon 1, Marshall Isl. 1	D. in Nigeria /Marshall Islands & Nepal
Total 25 name families, 65 names (51 long, 12 short, 2 very short)		
Gamphasantes	Sante N=9513, Philippines 3689, India 1418, DR Congo 629; forename N=29,129, Italy 21,727, India 1923, Nepal 1206, DR Congo 1048,	D. in Aruba & Philippines / San Marino & Italy
	Gamfa N=2, India 1, Cameroon 1; fname N=71, India 70, Cameroon 1	D. in Cameroon/India
Atlantes	Atlan N=5158, France 2802, Turkey 1378, Israel 696, USA 68; fname N=623, Turkey 266, 143, Indonesia 62, Iran 29, USA 24, India 17, Brazil 15, Pakistan 7	Austria ; D. in Monaco & Israel / Marshall Islands & Turkey
	Adlan N=24,032, Sudan 16,520, Egypt 2,227, Saudi Arabia 1391, Syria 1263, Yemen 830; fname N=9695, Sudan 3570, Russia 2500, Indonesia 1677, Turkey 466	D. in Sudan & Syria / Sudan & Russia
Himantopodes	Podes N=391, Philippines 347, USA 22, Germany 14, Papua NG 4; fname N=4, India 2, Philippines 1, USA 1	Podes(locality, Asturias, Spain), D. in Philippines/Philippines
Magium	Magiu N=166, Romania 120, Papua NG 46; fname N=18, India 6, Papua NG 6, DR Congo 4	D. in Romania & Papua NG / Papua NG & DR Congo
Muhit	Muhit N=10,291, Bangladesh 8291, Indonesia 1258, Turkey 239, India 221; fname N=6472, Bangladesh 3574, Indonesia 1349, India 754, Kazakhstan 505	Nigeria ; D. in Bangladesh & Indonesia / Kazakhstan & Bangladesh
	Muhid N=4269, Indonesia 2767, Bangladesh 901, India 290, Malaysia 134, Nigeria 104, Philippines 22, Paksitan 12, USA 3; fname N=4126, Indonesia 1838, India 1450, Bangladesh 642, Nigeria 77,	D. in Indonesia/Qatar
Aulil	Aulil Philippines 1/1; fname Indonesia 236/236	Equatorial Guinea ; D. in Philippines / Indonesia
	Aulila N=34, Germany 29, USA 1, Brazil 1; fname N=114, Tanzania 110, Brazil 4	D. in Germany/Tanzania
Lepteacra	Lepte N=0; forename N=5, Burkina Faso 1, DR Congo 1, India 1, Nepal 1, Philippines 1	D. in nil / Burkina Faso
	Lebte N=0; fname India 1/1	D. in nil/India
Very short names		
Blemmyae	Blem N=1022, Russia 203, USA 190, Denmark 172, Bermany 88, Philippines 85; fname N=35, India 10, Indonesia 7, Philippines 5, Cameroon 2, Algeria 1, Canada 1, China 1	France; Densest in Denmark & Kyrgyzstan/Liberia & Congo
Magium	Magi N=20,684, India 6876, Italy 4966, Indonesia 2092, Nigeria 1033, Egypt 854, DR Congo 513; fname N=39,983, India 20,323, Egypt 5791, DR Congo 4129, Indonesia 2050, Lebanon 1691, Nepal 1480, Papua New Guinea 902, Spain 892, Nigeria 503	Ethiopia(4) , Japan(5) , Rwanda, Georgia, Corded Ware Russia, Switzerland, India, Chad; Densest in Solomon Islands & Italy / Lebanon & Papua NG

Appendix table 28: Regional summary of the appearance of Ancient West African names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	5	2	7	3	2	5	8	4	12
Corded Ware Europe	5	0	5	0	0	0	5	0	5
Kurgan Europe	0	0	0	1	0	0	1	0	1
Balkans	0	1	1	0	0	0	0	1	1
Middle East	2	3	5	1	0	1	3	3	6
Central and Northern Asia	0	1	1	0	0	0	0	1	1
Gedrosia	0	1	1	0	0	0	0	1	1
India, Nepal, Sri Lanka	18	5	23	5	0	5	23	5	28
Indochina	1	0	1	2	0	2	3	0	3
Sundaland	7	2	9	6	0	6	13	2	15
China etc.	0	0	0	0	0	0	0	0	0
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	4	2	6	3	0	3	7	2	9
Maghreb	1	1	2	0	0	0	1	1	2
West Africa	6	11	17	0	2	2	6	13	19
Central and South Africa	5	2	7	0	0	0	5	2	7
Greece and Egypt	0	1	1	0	0	0	0	1	1

Appendix table 29: Geographical distribution of Legendary African names

	Anthroponyms	Places
Katonda	Katonda N=1799, Malawi 471, DR Congo 390, Tanzania 390, Zambia 384, Uganda 153; fname N=316, Zambia 261, DR Congo 34, USA 14	DR Congo(2), Malawi(2), Zambia; D. in Malawi/Zambia
	Gatonda Uganda 1/1; fname Uganda 1/1	Gatondagira(stream, Rwanda); D. in Uganda/Uganda
Nyikang	Nyikang N=7, Sudan 4, India 1, South Sudan 1; fname N=19, India 14, South Sudan 4, Sudan 1	D. in Sudan/South Sudan
	Nyikang N=7, Sudan 4, India 1, South Sudan 1	Nyikangombe (stream, Zambia); D. in Sudan/
Shango	Shango N=6614, Tanzania 4098, DR Congo 1382, Kenya 432; fname N=1116, Tanzania 342, Pakistan 265, DR Congo 185, USA 68, Kenya 63	Burundi(2), India, Nigeria(2), DR Congo, Rwanda(4), France; D. in Tanzania / Botswana
	Shanko N=10,230 Ethiopia 8371, Russia 653, Ukraine 537, USA 249; fname N=21,881, Ethiopia 21,500, India 187, Bulgaria 97, South Africa 40, Pakistan 34, USA 6	Shange/Shanko(town, China), Shankou(town, China), Shank'o (locality, Ethiopia), Shankoi(India), Shanko(mountain, Pakistan), Shankou(hamlet, China), Shankou(locality, China), Tegermansu Pass/Shanko(saddle, in Afghanistan); D. in Ethiopia/Ethiopia
Olorun	Olorun N=208, Nigeria 200, USA 3; forename N=94, Nigeria 73, Benin 19	D. in Nigeria/Benin
Mujaji	Mujaji N=2087, Zimbabwe 1862, Indonesia 83, DR Congo 41, Botswana 28, Philippines 20; forename N=1793, South Africa 1161, India 297, Zimbabwe 231	Albania; D. in South Africa/South Africa
Kibuka	Kibuka N=3414, Uganda 1822, DR Congo 1334, Kenya 174; fname N=232, DR Congo, Uganda 26	DR Congo(3), Kenya; D. in Uganda/DR Congo
	Kipuka N=358, DR Congo 233, Tanzania 123, Latvia 1; fname N=122, DR Congo 110, South Africa 7	Kipuka(village, DR Congo), Kipuka (locality, DR Congo), Kipuka(stream, DR Congo); D. in DR Congo/DR Congo
17 name families, 24 names (10 long, 6 short, 8 very short)		
Kintu	Kintu N=29,045, Uganda 24,431, DR Congo 3824, Tanzania 397, Malawi 131, USA 68, England 56, India 33; forename N=3047, India 1943, DR Congo 712, Uganda 226, Bhutan 49	Rwanda(2), DR Congo; D. in Uganda/Bhutan
	Cintu N=307, India 261, Guatemala 39, DR Congo 4; fname N=16,966, India 16,798, Nepal 153, UAE 4	Cintu(mount, Corsica, France); D. in Guatemala/India
Nambi	Nambi N=38,458, Uganda 32,254, Angola 2563, India 1435, Benin 1377; fname 1861, India 1022, Indonesia 172, Uganda 137, UAE 89, Papua New Guinea 83	Ghana, Indonesia, Uganda(2), Namibia, India, Angola(3), South Sudan, Burundi, DR Congo; D. in Uganda/UAE
	Nampi N=281, India 188, Indonesia 45, Philippines 14, Papua New Guinea 7, Senegal 7, Thailand 5; fname N=1331, India 1094, Indonesia 166, Ivory Coast 34, South Africa 20, Papua New Guinea 7, Philippines 4, Cambodia 2	China(2), Asian Russia; D. in Papua NG/Ivory Coast
Nyame	Nyame N=24,488, Ghana 22,167, Cameroon 1260, Nigeria 224; fname N=2077, Ghana 1742, India 113, Nigeria 58	Niger, Mali, Liberia, Ghana, South Africa, Ivory Coast; D. in Ghana/Ghana
	Niame N=499, Morocco 341, Ivory Coast 92, Papua NG 28, Burkina Faso 20; fname N=830, Senegal 298, Mali 276, Mauritania 101, Ivory Coast 40, Papua NG 40	D. in Morocco/Mauritania
Very short names		
Amma	Amma N=160,676, India 145,427, Tanzania 6705, Niger 2373, Ethiopia 1288, Ghana 831, Sri Lanka 731, Indonesia 687, Nigeria 612, Cameroon 399; fname N=31,549 Ghana 7136, Cameroon 4132, India 4022, Chad 4016, Nigeria 2883	Iran, Finland(3), India(2), Chad, Sweden, Uganda
Cagn	Cagn USA 1/1; forename N=6, Turkey 4, Luxemburg 1, Spain 1	Italy
Eshu	Eshu N=163, Nigeria 136, India 10, USA 9; fname N=583, India 514, USA 17, Cameroon 5	Japan, Kenya(2)
Leza	Leza N=6511, Bangladesh 1712, Mexico 1257, Spain 776, DR Congo 705, USA 608, Egypt 458; fname N=10,089, Bangladesh 4307, Niger 2479, USA 816, DR Congo 527, Philippines 403, Nigeria 332	Spain(3), Zambia, Corded Ware Russia, Afghanistan, Malawi(2), Lithuania
Ogun	Ogun N=10,777, Nigeria 10,000, England 360; fname N=7777, Nigeria 7582	Nigeria(11), Turkey(2), Papua New Guinea
Punt	Punt N=3905, Netherlands 1918, USA 681, England 422, South Africa 304; forename N=92, India 72, Spain 6, Belgium 2	Somalia; Italy(3), Netherlands, Belgium, Indonesia, Switzerland(4), South Africa
Zoa	Zoa N=6904, Cameroon 5959, DR Congo 499, Venezuela 126; fname N=1771, Pakistan 377, USA 341, Cameroon 285, Venezuela 157, Spain 53	Liberia, Angola(2), Ghana(2), Malawi, Cameroon(2), Pakistan, Republic of Congo
Gu	Gu N=4,835,026, China 4,733,296, Taiwan 57,378, Thailand 10,315, USA 6947, India 5886, Singapore 4348; forename N=24,034, India 14,612 Myanmar 2100, Singapore 1733, Vietnam 1107, China 658, France 604, Kazakhstan 478	Micronesia, China(2), France(2), Iran(2), Baluchistan, Georgia, Indonesia, Nigeria(4), Kenya, India, DR Congo

Appendix table 30: Regional summary of the appearance of Legendary African names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	0	1	1	0	1	1	0	2	2
Corded Ware Europe	0	0	0	0	0	0	0	0	0
Kurgan Europe	0	0	0	0	0	0	0	0	0
Balkans	0	1	1	0	0	0	0	1	1
Middle East	0	0	0	0	0	0	0	0	0
Central and Northern Asia	0	0	0	0	1	1	0	1	1
Gedrosia	0	2	2	0	0	0	0	2	2
Ext. India	1	1	2	6	1	5	7	2	9
Indochina	0	0	0	0	0	0	0	0	0
Sundaland	0	0	0	0	1	1	0	1	1
Ext. China	0	4	4	0	2	2	0	6	6
Japan and Koreans	0	0	0	0	0	0	0	0	0
East Africa	7	7	14	2	6	8	9	13	22
Maghreb	0	2	2	0	0	0	0	2	2
West Africa	2	2	4	2	6	8	4	8	12
Centr & South Africa	6	12	18	0	7	7	6	19	25
Greece and Egypt	0	0	0	0	0	0	0	0	0

Appendix table 31: Geographical distribution of Sea People names

	Anthroponyms	Place names
Denyen	Denyen N=5, Liberia 3, Azerbaijan 1, Cameroon 1; fname N=5, Turkey 3, Liberia 1, Nigeria 1	D. in Liberia & Azerbaijan /Liberia & Turkey
	Tenyen Liberia 90/90; fname Liberia 3/3	D. in Liberia
	Denien N=80, USA 60, Germany 17; fname N=51, USA 32, Indonesia 4, Brazil 3, South Africa 3, Taiwan 3	D. in Liberia/Jamaica
Danuna	Danuna N=6, Nigeria 5, DR Congo 1; fname N=13, India 3, Nigeria 3	D. in Nigeria / Papua NG & Nigeria
	Tanuna N=69, Nigeria 24, Solomon Island 23, Indonesia 21, Georgia 1; fname N=27, India 23, Nigeria 2, Belarus 1, Indones.1	D. in Belarus
	Danouna N=3, Algeria 1, Burkina Faso 1, Cameroon 1; fname N=12, Cameroon 11, Niger 1	Chad ; D. in Burkina Faso/Cameroon
Sherden	Sherden N=164, USA 139, Australia 15, Pakistan 3; fname, N=44, Philippines 12, Pakistan 7, South Africa 3	D. in Australia & Denmark/ Philippines & South Africa
	Serden N=234, Turkey 105, USA 48, Northern Cyprus 38, Bosnia and Herzegovina 21, Croatia 10; fname N=229, Turkey 175, India 16, Northern Cyprus 15, Kazakhstan 4, USA 4	D. in Northern Cyprus/Northern Cyprus
	Sherde N=41, India 40; USA 1; fname N=10, USA 5, Barbados1, Bulgaria 1, Haiti 1, Philippines 1, South Afr. 1	D. in India & USA /Barbados & Bulgaria
	Sherdeen, India 2/2; fname, N=71, India 64, Pakistan 1, South Africa 1	D. in India/India
	Sheerden USA 1/1; fname N=0	D. in USA/nil
	Sheerden Pakistan 1/1; fname N=2, Pakistan 1, Jammu and Kashmir 1	D. in Pakistan /Jammu and Kashmir
Eqwesh	Eqweiza Tunisia 1/1; forename N=0	D. in Tunisia /nil
	Egweshi Nigeria 2/2; fname Nigeria 4/4	D. in Nigeria / nil
Weshesh	Veshes N=0; fname India 2/2	D. in nil/India
	Veshesh N=0; fname N=20, India 17, Trinidad and Tobago 3; fname	D. in nil/Trinidad and Tobago
	Wesheshar N=0, forename, India 1/1	D. in nil/India
	Wesheshlas N=0, fname, Congo 1/1	D. in nil/ Congo
Peleset	Peleseto N=0; forename India 9/9	D. in nil/India
	Beleset N=0; fname Papua NG 1/1	D. in nil / Papua NG
	Belesetie Ethiopia 1/1; fname N=0	D. in Ethiopia / nil
Shekelesh	Shekele N=13, Nigeria 11; fname N=38, Zambia 27, DR Congo 4, South Africa 4	D. in Zambia & Nigeria / Zambia & South Africa
	Shekel N=1106, Ukraine 576, Israel 325, Russia 93, Nigeria 17; fname N=63, India 28, Philippines 10, Pakistan 5	D. in Israel & Russia /Barbados & Philippines
	Sekeleshu N=0; fname Malawi 1/1	Sekèlè (locality, Senegal), Sekele (locality, DR Congo), Sekele (locality, Kenya), Sekele(stream, DR Congo); D. in nil/Malawi
Shikala	Shikala N=573, DR Congo 493, India 34; fname N=363, India 184, DR Congo 82, Kenya 81, Pakistan 13	China(3); D. in DR Congo & Zambia / Kenya & DR Congo
	Sikala N=791, Finland 142, Zimbabwe 112, Kenya 95, Zambia 84, India 77, DR Congo 55, Thailand 55, South Africa 41, Uganda 36; fname N=583, India 239, Burkina Faso 174, Kenya 94, Zimbabwe 28, Indonesia 19, Papua NG 16, South Africa 4, Ivory Coast 2	Sikala(locality, Finland), Sikala(locality, DR Congo), Sikala(hill, Tanzania); D. in Finland / Burkina Faso

Appendix table 33: Geographical distribution of Berber and Libu names

	Anthroponyms	Place names
Ameqran	Ameqran N=18, Belgium 16, Estonia 1, France 1; forename N=0	D. in Belgium /nil
	Ameqran N=458, Morocco 409, Belgium 21, Spain 20; fname N=4, India 3, Belgium 1	D. in Morocco /Belgium
Amastan	Amastan, N=6, Niger 5, France 1; fname N=27, India 22, Philippines 3, Niger 1, France 1	D. in Niger/ Niger
	Amasdan N=0; fname Indonesia 3/3	D. in nil/ Indonesia
Hariese	Hariesem N=0, forename India 1/1	D. in nil/India
	Haries N=301, Indonesia 177, UAE 39, England 31, India 22, USA 20; fname N=1019, Indonesia 771, Philippines 139, India 47, UAE 30	D. in UAE/UAE
Kahina	Kahina N=298, DR Congo 246, Namibia 21, France 6, India 5, Algeria 3; forename N=27,725, France 1459, India 144, Canada 93, USA 44, Spain 33, Indonesia 25, DR Congo 21, Brazil 21, Qatar 20	Kahina (hamlet, France); D. in US Virgin Islands/ Algeria
	Cahina N=40, Philippines 36, India 3, Algeria 1; fname N=268, India 233, Brazil 25, Indonesia 6	D. in Philippines /India
Karomama	Karomamai Papua NG 1/1	D. in nil/ Papua NG
	Caromamis N=0; fname Philippines 2/2	D. in nil/Philippines
Meddur	Meddur N=62, Turkey 55, Germany 6; fname India 1/1	D. in Turkey /India
	Medduram, forename India 1/1	D. in nil/India
Munatas	Munatas N=0; forename N=18, Indonesia 12, India 6	D. in nil/ Indonesia
	Munadas N=4, India 2, Malaysia 1, Nigeria 1; fname India 41/41	D. in Malaysia/India
Menkheperre	Menkhe India 1/1;	D. in India
	Menkhee N=0, forename Mongolia 1/1	D. in Mongolia
Nimlot	Nimlot Papua NG 1/1; forename N=4, Zimbabwe 2, Brazil 1	D. in Papua NG / Zimbabwe
	Nimlod N=0; fname N=120, Malawi 85, Uganda 25, Kenya 6	D. in nil/ Malawi
Osorkon	Osorkan N=0; forename Kyrgyzstan 29/29	D. in nil/ Kyrgyzstan
	Piankh, N=11, USA 6, Trinidad and Tobago 4, Uganda 1; fname N=15, USA 9, England 2, Haiti 2, India 1	D. in Trin.&Tobago/ Trin.&Tobago
Biankh	Biankh N=0; fname Chile 1/1	D. in nil/Chile
	Biankho N=2, Kazakhstan + Kyrgyzstan 2; fname N=0	D. in Kyrgyzstan
Rudamun, Rudamon	Rudamuni N=0, forename India 1/1	D. in nil/India
	Rudamo Ethiopia 1/1, forename N=0	D. in Ethiopia /nil
Shoshenq	Rudamohan N=0, forename India 5/5	D. in nil/India
	Shoshen N=6, Russia 2, USA 2, Lebanon 1, Sweden 1; forename N=195, Iraq 174, India 9, Jordan 7, Pakistan 2, USA 2	D. in Lebanon / Iraq
Sufian	Sufian N=36,235, Yemen 16,165, Bangladesh 6579, Ethiopia 4185, Egypt 2502, Pakistan 2023; forename, N=62,310, Bangladesh 10,814, Iraq 8806, Sudan 6346, Jordan 5859, Saudi Arabia 5420, Palestine 3801, Yemen 2985, Malaysia 2535, Libya 2387	Sufian (town, Iran), Sufian (village, Iran), Sufian (village, Iran), Šūfiān (locality, Iran), Šūfiān (farm village, Iran), Šūfiān (village, India), Sakin/Sufian (hamlet, Yemen), Šūfiyān (locality, Afghanistan); D. in Yemen / Tunisia
	Sufiana N=606, Indonesia 525, Nigeria 65, Malaysia 9, Pakistan 2, Uganda 2; fname N=1068, Indonesia 883, Nigeria 72, Malaysia 60	D. in Indonesia/Indonesia
Tabeke-tenasket	Tabeke N=0; fname N=3, Albania 1, Indonesia 1, South Afr. 1	Tabeke (locality, Kazakhstan); D. in nil/Albania
	Tapeke N=9, Papua NG 8, Ivory Coast 1; fname Papua NG 1/1	Tapeke (well, Kazakhstan); D. in Papua NG/ Papua NG
Tashep	Denaske USA 1/1; fname N=0	D. in USA/nil
	Tashepo Nigeria 1/1; forename N=0;	D. in Nigeria /nil
Tentsai	Tasheba N=0; fname N=197, USA 190, Jamaica 3	Kalinino /Tasheba (locality, Russia), Tasheba (stream, Russia), Tasheba(locality, Russia)
	Tentsa N=3, South Africa 2, Uganda 1; fname India 1/1	D. in South Africa /India
Tensai	Tensai N=53, USA 13, Ethiopia 9, Cameroon 5, Japan 5; fname N=49, Ethiopia 25, Qatar 8, USA 6	Tensaït (locality, Morocco); D. in Israel/Qatar
	Tifawt Morocco 136/136; forename N=0	Agni Tifawt (mountain, Morocco), Koudiat-nAit Tifawt (Morocco); D. in Morocco/nil
Titrit	Titrit Morocco 239/239; forename N=423, Morocco 409, Indonesia 9, USA 2	Titrit (spring, Morocco), Titrit (mountain, Morocco), Titrit (well, Morocco); D. in Morocco/Morocco
Yedder	Yedder, N=211, Algeria 165, Tunisia 14; forename, N=4, Algeria 1, Canada 1, Peru 1, Philippines 1	Yedder (suburb, Libya); D. in Algeria /Peru
	Jedder N=4, USA 3, Russia 1; fname N=16, Brazil 7, Philippines 3, Equador 2, Australia 1, Barbados 1, India 1, South Africa 1	D. in USA/Barbados
Atala	Atala N=19,334, Uganda 8394, India 2632, Egypt 1610, Ethiopia 1610; forename, N=5943, India 2685, Mexico 1135, Colombia 442, Chile 308	~~Atala (suburb, Finland)~~ , Atala (village, Uganda), Atala (village, India), Atāla (village, India), Atalanti (town, Greece), Atāla (locality, India), Atala (village, Spain), Atala(locality, Spain), Atala (locality, Chad), Atala (stream, Cameroon); D. in Uganda /Dom.Rep
	Atalaia N=764, Portugal 377, Brazil 359, Angola 9, Argentina 9, USA 8, Cape Verde 1, England 1; fname N=19, Brazil 17, France 1, Zimbabwe 1	Atalaia (locality, Portugal (6)), Atalaia (village, Portugal (2)), Atalaia (hamlet, Cape Verde); D. in Portugal/
	Adala N=6456, India 2576, Algeria 945, Kenya 897, Philippines 668, Ghana 277, Cameroon 152, DR Congo 144, Nigeria 130, Uganda 111, Djibouti 100; fname N= 2839, India 953, Nigeria 265, Niger 242, DR Congo 226, Palestine 194	Adala (village, Turkey), Adala (village, Iraq), Adalaj (town, India), Adala (municipality, Turkey), Adala (village, Uganda); D. in Djibouti/Palestine

Aksil	Aksil, N=1450, Algeria 1162, France 256, Turkey 7; forename, N=45, India 12, Algeria 6, Lebanon 6	D. in Algeria / Lebanon
	Acsil Haiti 1/1; fname N=0	D. in Haiti/nil
Badis	Badis N=7614, Algeria 6506, Morocco 648, Indonesia 89, Iran 58; forename, N=6398, Algeria 5930, France 180, Tunisia 92, India 42	Badis (hamlet, Morocco), Badis (locality, France), Badis (stream, Russia); D. in Algeria/Algeria
	Padis N=978, Philippines 806, USA 49, Malaysia 35, Indonesia 32; fname N=176, Colombia 124, India 16, Indonesia 15, DR Congo 4	Padis (village, Romania), D. in Philippines/
Gwafa	Gwafa, N=758, Zimbabwe 717, Botswana 22, England 9; forename, N=42, Zimbabwe 41, Australia 1	D. in Zimbabwe/Zimbabwe
	Guafa Cameroon 1/1; fname China 1/1	D. in Cameroon/China
Idder	Idder N=4027, Niger 1885, Algeria 1085, Morocco 954, France 77; forename, N=1573, Morocco 1338, Niger 200, England 9	Idder (neighbourhood, Morocco), Idder (locality, Morocco), Idder (hill, Morocco), Iddergem(village, Belgium); D. in Niger /Morocco
	Idderis N=3, Malaysia 2, Singapore 1; fname N=20, Indonesia 11, Malaysia 9	D. in Malaysia/Singapore
Igide	Igide N=102, Nigeria 86; India 16; fname N=46 India 44, England 1, Niger 1	D. in Nigeria/ Niger
	Itige N=87, South Africa 84, DR Congo 1, India 1, Nigeria 1; fname N=3, Brazil 1, Nigeria 1, South Africa 1	Itige (locality, India); D. in South Africa/South Africa
Isetweret	Weret N=9, China 2, Papua NG 2, Egypt 1, Ethiopia 1, Kazakhstan 1, Russia 1; fname N=21, Indonesia 12, Papua NG 2, Ethiopia 1, Pakistan 1, Germany 1, Guinea 1, Russ. 1, Thailand 1	D. in Papua NG/ Papua NG
	Veret N=1833, France 1711, Romania 32, USA 19; fname N=34, Guinea 11, USA 6, Papua New Guinea, India 4	Véret (hamlet, France), Véret (hamlet, France), Veret (hamlet, Norway); D. in France/Guinea
Menkheperre	Perre N=2049, France 610, Italy 423, Australia 293, Brazil 200, USA 162, Portugal 85; forename DR Congo 110, USA 54	Adiymán/Perre (city, Turkey), Perre(village, Portugal), Perret (commune, France), Perre (locality, Belgium), Perré (hamlet, France), Perré (hamlet, Italy , Mozambique); D. in Suriname/ Cameroon
	Menke N=22,254, Germany 13,589, USA 6817, Netherlands 486; fname N=321, Netherlands 131, Germany 47, South Africa 41, Nigeria 31	Minkiai/Ménkē (village, Lithuania); D. in Nauru/Marshall Islands
Merytmüt	Meryt 2859, Yemen 2799, Iraq 52, Jordan 5; forename N=99, Mexico 30, USA 17, Estonia 11, UAE 11, Lebanon 5, Brazil 5	D. in Yemen /Estonia
	Merit N=1851, Turkey 960, USA 259, France 241, Nigeria 67, Algeria 66; fname N=9168, Nigeria 4231, Egypt 1670, Estonia 716	Mārīt (locality, Syria), Merit (village, Malaysia), Merit (locality, Malaysia), Merit (locality, Nigeria); D. in Saint Kitts and Nevis/Estonia
Kakat	Kakat N=1530, Indonesia 882, UAE 221, India 124, Papua NG 92, Thailand 80, Afghanistan 35, Qatar 31, Turkey 30; forename N=448, India 272, Pakistan 53, Indonesia 51, Papua NG 42, Afghanistan 14	Indonesia , Hungary ; D. in UAE, Qatar & Papua NG / Papua NG & UAE
	Cacat N=21, France 14, Romania 3, Canada 1, India 1, Indonesia 1, Spain 1; fname N=20, India 14, Indonesia 4, Philippines 1, Romania 1	D. in France/Romania
Ridha	Ridha N=8703, Indonesia 5756, Saudi Arabia 1232, UAE 354, Morocco 204; forename, N=13,896, India 7006, Bangladesh 1833, Indonesia 1121, USA 771	Ridha (mountain, Saudi Arabia); D. in Tunisia /Tunisia
	Ritha N=716, DR Congo 438, Indonesia 118, India 77, Malaysia 16; fname N=39,132, Tanzania 17,923, DR Congo 4081, Indonesia 2930, Rwanda 2417, India 1902	Ritha (hamlet, Nepal), Ritha (hamlet, India), Ritha (village, India), Rithā (locality, Nepal), Ritha (locality, India), Ritha (village, India), D. in Tanzania
Si-Ese	Siese N=206, Germany 68, USA 42, England 35, Puerto Rico 24, South Africa 18; fname N=8, Brazil 3, USA 2	Siésé (locality, Rep.of Congo); D. in Bermuda/Australia
Tifawt	Tifaw Somalia 1/1; fname N=0	

Appendix table 34: Regional summary of the appearance of Berber and Libu names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	3	0	3	7	15	22	10	15	25
Corded Ware Europe	2	0	2	0	2	2	2	2	4
Kurgan Europe	0	0	0	0	2	2	0	2	2
Balkans	0	0	0	0	0	0	0	0	0
Middle East	3	1	4	2	6	8	5	7	12
Central and Northern Asia	3	5	8	0	1	1	3	6	9
Gedrosia	0	5	5	0	0	0	0	5	5
India, Nepal, Sri Lanka	12	2	14	8	12	20	20	14	34
Indochina	1	0	1	0	0	0	1	0	1
Sundaland	12	0	12	6	3	9	18	3	21
China etc.	0	0	0	2	0	2	2	0	2
Japan and Koreans	0	0	0	0	0	0	0	0	0
East Africa	3	0	3	3	2	5	6	2	8
Maghreb	4	8	12	4	4	8	8	12	20
West Africa	2	0	2	5	3	8	7	3	10
Central and South Africa	4	0	4	5	2	7	9	2	11
Greece and Egypt	0	0	0	0	0	0	0	0	0

Appendix table 35: Geographical distribution of Iberian names

	Anthroponyms	Places
Aibekeres	Aibeketova Kazakhstan 15/15; forename N=0	D. in Kazakhstan/nil
Amusico	Amusica N=0, forename Japan 1/1	D. in nil / Japan
	Amusiki Uganda 1/1; fname N=0	D. in Uganda/nil
Amaina	Amaina, N=185, Indonesia 82, Italy 72, Nigeria 11, Pakistan 9, India 3, Niger 2; forename, N=453, India 161, Niger 138, Nigeria 48, Philippines 37, Pakistan 36	India, Italy; D. in Italy & Indonesia / Niger & Philippines
	Amainat N=0; fname N=6 Pakistan 12, Nigeria 4	D. in nil/Pakistan
Alucio	Alucio N=4, Brazil 2, Mexico 1, Venezuela 1; forename N=94, Brazil 63, Philippines 13, Indonesia 4	Spain(4); D. in Venezuela & Mexico / Aruba & Philippines
	Alukio Uganda 9/9; fname Uganda 1/1	D. in Uganda/Uganda
	Alusio N=34, Canada 17, Papua NG 10, Indonesia, USA, Kenya; fname N=68, Brazil 57, Papua NG 4, Uganda 2	D. in Papua NG/Suriname
Bagarok	Bagaro N=67, Philippines 37, Pakistan 16, Taiwan 4, Papua NG, Ethiopia 1, India 1, Nigeria 1, Burkina Faso 1; fname N=290, India 256, Pakistan 32, Benin 1, Liberia 1;	D. in Papua NG & Philippines / Liberia & Benin
Balcaldur	Balcal Turkey 165, France 1, Iran 1, USA 1; Forename N=0	D. in Turkey & France / Nil
Binturke	Binturki N= 206, Saudi Arabia 199, Bahrain 4, USA 2, South Korea 1; fname N=0	D. in Saudi Arabia / nil
Edereta	Edereta N=0; fname, N=4, Philippines 3	D. in nil/Philippines
	Eterete N=0; Nigeria N=7	D. in nil/Nigeria
Iberian	Iberian Malaysia 1/1; fname N=9, India 5, Brazil 2, Luxemburg 1, Spain 1	Iberian (mountain, Georgia); D. in Malaysia / Spain & Luxemburg
	Iberia N=29, Nigeria N=29, Nigeria 24, Kenya 2, Spain 1; fname N=121, Indonesia 557, USA 146, Brazil 93, Colombia 65	Iberia(peninsula, Spain/Portugal), Iberia(neighbourhood, Morocco); D. in Nigeria/Bermuda
	Iperia DR Congo 4/4; fname N=8; Indonesia 7, USA 1	Greece; D. in DR Congo / Indonesia
Indibil	Indibilli India 29/29; forename India 14/14	D. in India/India
	Intipilli India 1/1; fname N=0	D. in India/nil
	Indipilli India 4/4; fname N=0	D. in India/nil
Korribilo	Korribilli India 12/12; fname N=0	D. in India / nil
	Korripilli India 5/5; fname India 1/1	D. in India/India
Nabarsosin	Nabarsho Afghanistan 1/1; forename N=0	D. in Afghanistan / nil
Nerseadin	Nersea N=0, fname Zimbabwe 1/1	D. in nil/Zimbabwe
Sakarbik	Sakarbi N=0; fname India 1/1	D. in nil/India
	Sakarbibi N=0; fname India 1/1	D. in nil/India
Sakarisker	Sakaris N=177, Papua New Guinea 50, USA 49, Greece 26, Australia 25, India 3; fname N=50, Faroe Islands 15, Papua New Guinea 14, Indonesia 11, India 5	D. in Papua NG & Greece / Papua NG & Faroe Islands
	Riskier N=200, USA 93, England 76, Germany 18, Isle of Man 7, Israel 3, India 2, China 1; fname N=5, China 2, Taiwan 1, USA 1, Venezuela 1	D. Isle of Man/Taiwan
Sinebetin	Sinebeth N=0, Forename South Africa 1/1	D. in nil/South Africa
Tarbandu	Tarbandu Burkina Faso 117/117; forename Venezuela 1/1	D. in Burkina Faso / Venezuela
Tarkunbiur	Tarkunbur Nigeria 22/22; fname Nigeria 7/7	D. in Nigeria/Nigeria
	Tarkun N=193, Turkey 165, Indonesia 25, Liberia 1, Russia 1, USA 1; fname N=247, Indonesia 223, India 19, Turkey, France, Kyrgyzstan, Thailand	Tarkun(locality, India), Tarkun (peak, Iraq), Tarkun (valley, Iran); D. in Turkey/Indonesia

Turibas	Turibas, Brazil 10/10; forename N=3, Brazil 2, Malaysia 1	Latvia; D. in Brazil/Brazil & Malaysia
Total 23 name families and 36 names (29 long and 7 short)		
Budar	Budar N=1802, India 897, Bhutan 263, Romania 84, Ukraine 67; forename, N=557, India 407, Bhutan 82, Pakistan 28, Indonesia 15, Nepal 13, Qatar 5, Nigeria 3, Uganda 2	Nepal (2), Pakistan (2), India; D. in Bhutan & Mexico / Bhutan & Qatar
	Pudar N=1399, Bosnia and Herzegovina 771, Serbia 250, Croatia 100, India 76, USA 61, Canada, Russia, Indonesia, Mongenegro, Norway; fname N=36, Indonesia 22, India 9, Canada 1, Nepal 1, Philippines 1, Taiwan 1, USA 1	Pudar(Village, Indonesia), Pudar(peak, Indonesia), D. in Bosnia and Herzegovina
Ildutas	Ildut Cap Verde 1/1; forename N=20, France 19, England 1	D. in Cap Verde/France
Iltiradin and Isceradin	Radin N=11,337, Malaysia 1683, USA 1647, Philippines 1234, Russia 1227, Serbia 1020, Bangladesh 811, Italy 661; fname N=6809, Indonesia 2750, Malaysia 2681, Philippines 554, India 183, Iran 109, Egypt 108	Austria, Iraq (2), Belarus, Corded Ware Russia, Croatia, Bosnia and Herzegovina; D. in Brunei & Serbia/ Brunei & Malaysia
Nabarsosin	Nabar N=2125, India 1620, USA 200, Indonesia, Iran, Pakistan, Brazil, Malaysia, Taiwan, Singapore; fname N=1023, India 802, Indonesia 61, Iraq, 34, Iran 27, Pakistan, Spain, Brazil, Afghanistan, USA, Philippines	Nabar(locality, Iran), Nabar(village, Indonesia), Nabar(hamlet, India), Nabar(locality, Senegal), Nábár (mountain, Norway); D. in Singapore/Marshall Islands
Unibetin	Betin N=6030, Colombia 3454, Russia 692, Brazil 631, France 530, Turkey 225; forename N=413, Indonesia 161, Honduras 30, India 27, DR Congo 27, USA 26	D. in Venezuela & Slovakia / Honduras & Northern Cyprus
Unibelos	Belos N=818, Greece 228, Philippines 214, Taiwan 63, Brazil 60, Argentina 46, USA 39, India 21; fname N=105, DR Congo 48, India 21, Indonesia 13, Philippines 13.	Nigeria (2); D. in Greece & Taiwan / DR Congo & Sweden
Very short names (none)		

Appendix table 36: Regional summary of the appearance of Iberian names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	1	6	7	1	1	2	2	7	9
Corded Ware Europe	1	1	3	0	3	3	1	4	5
Kurgan Europe	0	0	0	0	0	0	0	0	0
Balkans	0	1	1	2	1	3	2	2	4
Middle East	3	2	5	0	2	2	3	4	7
Central and Northern Asia	1	0	1	0	0	0	1	0	1
Gedrosia	2	0	2	0	3	3	2	3	5
India, Nepal, Sri Lanka	11	2	13	4	4	10	15	6	21
Indochina	0	0	0	0	0	0	0	0	0
Sundaland	11	0	11	4	3	7	12	3	15
China etc.	1	0	1	0	0	0	1	0	1
Japan and Koreas	1	0	1	0	0	0	1	0	1
East Africa	3	0	3	0	0	0	3	0	3
Maghreb	0	1	1	1	1	2	1	2	3
West Africa	5	0	5	0	2	2	5	2	7
Central and South Africa	3	0	3	1	0	1	4	0	4
Greece and Egypt	0	0	0	1	0	1	1	0	1

Appendix table 37: Geographical distribution of the Indigeteian names

	Anthroponyms	Place names
Indigetes	Indige India 1/1; fname N=0	Indigetawela (Sri Lanka); D. in India/nil
	Indiket N=0, fname N=2, India 1, Indonesia 1	D. in nil/Indonesia
	Indiketiya N=372, Sri Lanka 365, England 7; fname N=0	Indiketiya, estate (Sri Lanka); D. in Sri Lanka/nil
Ampurias	Ampurias N=74, Philippines 71, France 1, Guam 1, UAE 1; fname N=0	Spain(ancient); D. in Guam/nil
	Ampuria Malaysia 10/10; fname N=0	D. in Malaysia/nil
	Ampuriano N=0; fname Philippines 1/1	D. in nil/Philippines
	Ampuri N=49, India 37, Papua NG 8, Sweden 2, USA 2; fname N=13, India 9, South Africa 2, Nepal 1, Papua NG 1	D. in Papua NG/Papua NG
Indika	Indika N=25,604, Sri Lanka 24,704, Kenya 338, UAE 242, Indonesia 88, Qatar 72, Bahrain 59, Papua NG 14, Nigeria 12, India 12; fname N=132,816, Sri Lanka 129,195, Saudi Arabia 1049, UAE 649, Bangladesh 458, Indonesia 372, England 163	DR Congo; I-n-Dika (Niger), Indikatu (Sri Lanka), Spain(ancient); D. in Sri Lanka/Sri Lanka
	Indica N=92, Philippines 32, Indonesia 13, Russia 11, Italy 10, India 6; fname N=404, Sri Lanka 286, USA 57, India 25, UAE 6	D. in Jamaica/Sri Lanka
	Indiko N=2; Indonesia 1, Kazakhstan 1; fname 622, Georgia 443, Abkhazia 161, Kazakhstan 9	D. in Kazakhstan/Abkhazia
	Indike N=3, Kenya 1, Nigeria 1, Sri Lanka 1; fname N=1393, Sri Lanka 1359, Niger 17, UAE 4, USA 4	D. in Sri Lanka/Sri Lanka
Empodrae	Empod Thailand 1/1; fname Philippines 3/3	Empode (Indonesia, 2)

Juncaria	Juncaria N=0; fname Brazil 3/3	Spain(ancient); D. in nil/Brazil
	Juncario N=0; fname Brazil 1/1	D. in nil/Brazil
	Juncar N=119, Spain 39, France 29, England 18; fname N=51, Philippines 49, Brazil 1, Venezuela 1	D. in Spain/Philippines
	Junkari N=3/3, Finland 1, India 1, Iran 1; fname N=6, India 5, Bhutan 1	D. in Finland/Bhutan
Cinniana	Cinnia N=0; fname 149, Indonesia 101, USA 15, Mexico 8, Uruguay 4	Spain(ancient); D. in nil/Uruguay
	Ciniana N=0; fname N=13, Indonesia 11, Brazil 2	D. in nil/Indonesia
	Kinnian USA 1/1; fname USA 1/1;	D. in USA/USA
Deciana	Deciana Indonesia 31/31; fname N=93, Indonesia 73, Brazil 15	Spain(ancient); D. in Indonesia/Indonesia
	Decian N=194, Brazil 143, French Polynesia 25, Moldova 11; fname N=18, USA 7, Ivory Coast 2, Pakistan 2, Zambia 2	D. in French Polynesia / Grenada
	Desiana N=4470, Indonesia 4443, Qatar 16, Singapore 4; fname N=5339, Indonesia 4995, Tanzania 214, Albania 57	D. in Indonesia/Indonesia
	Clodian Greece 1/1; fname N=8, Albania 2, South Africa 2, Brazil 1, France 1, Philippines 1, Zimbabwe 1	Spain(ancient); D. in Greece/Albania
Clodianus	Klodian N=37, Indonesia 22, Greece 10, Albania 4; fname N=4906, Albania 4147, Greece 550, USA 64, Italy 59, England 31	D. in Albania
	Clodiano Brazil 2/2; fname Brazil 8/8	D. in Brazil/Brazil
	Clodiana N=0; fname N=20, Brazil 11, Haiti 5	D. in nil/Haiti
	Sambrock England 5/5; fname N=0	Spain(ancient); D. in England/nil
Sambrocias	Sambroghira Pakistan 1/1; fname N=0	D. in Pakistan/nil
	Samprok Indonesia 7/7; fname N=0	D. in Indonesia/nil
	Tichis N=0; fname India 1/1	Spain(ancient); D. in nil/India
Tichis	Tikhis N=0; fname India 1/1	D. in nil/India
	Indibil N=0; fname USA 1/1	D. in nil/USA
Indibilis	Indibilli India 29/29; fname India 14/14	D. in India/India
	Indibilly N=0; fname India 1/1	D. in nil/India
	Indipilli India 4/4; fname N=0	D. in India/nil
	Mandonius	D. in Papua NG/Indonesia
Mandonius	Mandoni N=183, Indonesia 87, Romania 31, USA 23, Papua NG 14; fname N=66, Indonesia 56, India 4, Philippines 2, South Africa 2	D. in Argentina/Paraguay
	Mandonia N=3, USA 2, Argentina 1; fname N=4, USA 2, Afghanistan 1, Paraguay 1	D. in Brasil/Venezuela
	Mandonio N=1, Brazil 1, USA 1; fname N=3, Peru 1, Venezuela 1, Philippines 1	Andopal (NW Russia); D. in USA/nil
Andobales	Andobal USA 1/1; fname N=0	D. in nil/India
	Andobala N=0; fname India 2/2	
Total 14 name families, 45 names (39 long, 6 short)		
Deciana	Desia N=623, Argentina 228, India 115, Indonesia 112, Israel 74; fname N=1541, Indonesia 519, South Africa 502, USA 127	Dēsi'ā (Ethiopia); D. in Israel/Anguila
Indika	Indik N=290, Russia 86, USA 58, Philippines 56, Indonesia 35, Niger 11; fname 236, Indonesia 184, India 22, Philippines 17, Nepal 6	Russia; D. in Czeckia/Indonesia
Rhoda	Rhoda N=4290, South Africa 2178, Nigeria 1166, Kenya 624, Philippines 121; fname N=263,800, Nigeria 59,626, Malawi 32,955, Tanzania 32,616	Spain(ancient); Germany, Egypt, Catalonia, Rhode (Belgium); D. in Solomon Islands/Malawi
	Rhodah N=213, Kenya 202, Nigeria 7, Uganda 2, England 1, Papua NG 1; fname 21,691, Zambia 7655, Zimbabwe 5509, Kenya 4322	D. in Kenya/Zambia
Tichis	Tichi N=587, Algeria 170, Hungary 111, USA 109, Iran 87; fname N=112, Niger 30, India 29, USA 12	Tichy (Algeria), Tichitt (Mauritania), Tichilesti (Romania,2), Tichiris (Romania), Tichideal (Romania); D. in Hungary/Niger
Very short names (none)		
No appearance: Ceturgi, Ilipula, Iptucci, Iptuci, Ituci;		
The red locations of the names Indik and Indica were not counted into the statistics as Indonesian names, since Indica means "From India".		

Appendix table 38: Regional summary of the appearance of Indigetes names

Region	Long names			5 letter names			Total names		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	2	8	10	0	2	2	2	10	12
Corded Ware Europe	0	1	1	1	1	2	1	2	3
Kurgan Europe	0	0	0	0	4	4	0	4	4
Balkans	2	0	2	0	0	0	2	0	2
Middle East	1	0	1	0	1	1	1	1	2
Central and Northern Asia	0	0	0	0	0	0	0	0	0
Gedrosia	1	0	1	0	0	0	1	0	1
India, Nepal, Sri Lanka	15	3	18	0	0	0	15	3	18
Indochina	1	0	1	0	0	0	1	0	1
Sundaland	15	2	17	1	0	1	16	2	18
China etc.	0	0	0	0	0	0	0	0	0
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	0	0	0	1	1	2	1	1	2
Maghreb	0	0	0	1	2	3	1	2	3
West Africa	0	1	1	2	0	2	2	1	3
Central and South Africa	0	1	1	2	2	4	2	3	5
Greece and Egypt	1	0	1	0	1	1	1	1	2

Appendix table 39: Geographical distribution of Ancient Etruscan names

Names	Anthroponyms	Places
Achile	Achile N=10,310, DR Congo 5423, Cameroon 1960, Nigeria 1489, Benin 554, Ivory Coast 183, Gabon, Burkina Faso 146 ; fname N=10,310, DR Congo 5423, Cameroon 1960, Nigeria 1489, Benin 552, Ivory Coast 183, Gabon 160, Burkina Faso 146	D. in Cameroon / Cameroon
Achmemrun	Achmemma N=0; fname India 1/1 Achemier USA 1/1; fname N=0	D. in nil / India D. in USA / nil
Alichsantre	Alichsan Indonesia 1/1; fname N=0	D. in Indonesia / nil
Althaia	Althaia Brazil 1/1; fname N=6, USA 4, Greece 1, Philippines 1	D. in Brazil / Greece
Amphare	Amphares France 2/2; fname N=0	D. in France / nil
Amuche	Amuche N=1175, Nigeria 1096; fname N=8705, Nigeria 8654, England 20, USA 17, Scotland 2	France , D. in Nigeria/Nigeria
Areatha	Areatha USA 4/4; fname N=391, USA 364, Guyana 9, Nigeria 5, England 4, South Africa 4	D. in USA / Guyana
Ataiun	Atauinta N=0; fname Nigeria 1/1 Ataiune Nigeria 5/5 / fname N=0	D. in nil / Nigeria D. in Nigeria / nil
Atlenta	Atlenta N=0; fname Marshall Islands 2/2 Atlnta N=0; fname USA 2/2 Atlent N=0, fname Albania 1/1 Atlnt N=0; fname N=0	Mexico , D. in Marshall Islands D. in USA D. in nil / Albania Austria
Atunis	Atunis N=0; fname India 2/2 Adunis N=16, Indonesia 12, Philippines 3, Malaysia 1; fname N=24, Uzbekistan , Philippines 6, Brazil 3 Atunisa Indonesia 7/7; fname India 3/3	D. in nil / India D. in Indonesia / Uzbekistan D. in Indonesia / India
Aturmica	Aturmin N=0; fname Indonesia 13/13	D. in nil / Indonesia
Cluthumustha	Cluthumu N=0, Uganda 1/1 Cluthum N=0; fname Uganda 1/1	D. in nil / Uganda D. in nil / Uganda
Crisitha	Crisithan N=0; fname Uruguay 1/1	D. in nil / Uruguay
Elcste	Elkste Georgia 1/1; N=0	D. in Georgia / nil
Elinei	Elinei N=0; fname N=824, Brazil 816, USA 3 Elinai Kenya 1/1; fname N=155, Brazil 135, Mexico 12, Peru 2, Uganda 2, Kenya 1	D. in nil / Brazil D. in Kenya / Brazil
Ermania	Ermania N=48, Indonesia 34, Iran 13; N=93, Indonesia 50, Brazil 23, Americas many Ermani N=306, Brazil 122, Indonesia 79, India 56; fname N=372, Indonesia	D. in Indonesia / Indonesia D. in Brazil / Georgia
Hamphiare	Hamphi N=0; fname India 1/1 Hamphire N=3, Canada 1, England 1, USA 1; fname N=0	D. in nil / India D. in Canada / nil
Heasun	Heasun N=0; N=36, USA 29, South Korea 5, India 1, Switzerland 1	D. in nil / South Korea
Meleacr	Meleac N=0; fname N=2, Nicaragua 1, South Africa 1 Meleak Egypt 4/4; N=3, USA 2, Sweden 1	D. in nil / Nicaragua D. in Egypt / Sweden
Memnum	Memnum Belgia 1/1; fname Nigeria 1/1	D. in Belgia / Nigeria
Memrum	Memrul N=0; fname India 30/30	D. in India
Metaia	Metaia N=0; fname Georgia 1/1 Metaiah N=0; India 1/1	Mozambique , D. in Georgia D. in nil / India
Metvia	Metvia N=0, surname USA 1/1	D. in USA
Nestur	Nestur N=12, Indonesia 10, Malaysia 1, Turkey 1; fname N=21, Albania 11, Russia 5, Philippines 2, N.Macedonia 1, S.Africa 1, Uganda 1 Nesturi N=90, Albania 76, USA 10; fname N=2, Albania 1, Colombia 1	D. in Indonesia / Albania D. in Albania / Albania
Palmithe	Palmithe N=0; fname N=12, India 11, Peru 1 Palmita N=0; fname India 6/6	D. in nil / Peru D. in nil / India
Pentasila	Pantasila N=0; fname India 1/1 Pentasilis Greece 1/1; fname N=0	D. in India D. in Greece
Pherse	Pherse USA 2/2; fname DR Congo 1/1	D. in DR Congo
Phuinis	Phuini N=0; fname India 2/2	D. in India
Prisis	Prisis N=57, Latvia 39, Israel 8, Pakistan 7; fname N=39, Indonesia 34, Cameroon 1, Americas 3, Papua NG 1 Prisisi South Africa 10/10; fname N=0	D. in Latvia / El Salvador D. in South Africa / nil
Sisphe	Sisphe N=0; fname South Africa 5/5	D. in South Africa
Taitle	Taitle USA 1/1; India 1/1	D. in USA / India
Talmithe	Talmithe Egypt 1/1; Peru 35/35 Talmitha N=0; fname India 1/1	D. in Egypt / Peru D. in nil / India
Tarchies	Tarchieso USA 1/1 Tarchie N=57, Liberia 52, England 2, USA 2, Nigeria 1; fname N=12, Liberia 6, USA 5, Ghana 1 Tarchieso N=0; fname USA 1/1	D. in USA D. in Liberia / Liberia D. in nil / USA
Tarchon	Tarchony Ukraine 1/1; fname N=0	D. in Ukraine / nil
Techrs	Techri India 51/51, fname N=0 Techra N=3, India 1, USA 1, Zambia 1	D. in India / nil Mexico ; D. in Zambia
Tlamunus	Tlamuni N=0; fname India 1/1	D. in nil / India
Tlamun	Talmun N=10, India 9, Nigeria 1; fname N=200, India 174, Iran 14, Indonesia 11, Nepal 1 Tlamu N=0; fname South Africa 2/2	D. in India / Iran D. in South Africa
Telmun	Telmun N=0; fname Nigeria 1/1	D. in Indonesia / Nigeria
Teriasa	Teriasa Indonesia 3/3; fname Nigeria 1/1	D. in Nigeria
Thethis	Thethis N=2, Brazil 1, USA 1 Thethisile South Africa 1/1; fname N=0	D. in Brazil D. in South Africa / nil
Tyrrenus	Tyrren N=0; fname Philippines 2/2	D. in nil / Philippines
Urusthe	Urustem N=13, Kyrgyzstan 11, Kazakhstan 2; N=2, Kyrgyzstan 9, Turkey 8, Russia 4, Ukraine 2	D. in Kyrgyzstan / Kyrgystan
Velparun	Velpari N=13, India 7, USA 4, England 1, Singapore 1; India 6/6	D. in Singapore / India
Vilates	Vilates N=0; fname India 4/4 Vilate N=52, France 21, Benin 16; fname N=117, USA 77, Nigeria 29, India 2	D. in nil / India Spain ; D. in Benin / Solomon Islands
Vikare	Vikare India 14/14; fname India 8/8	D. in India / India
71 name families, 105 names (69 long, 36 short)		
Achle	Achle N=5, India 4, Nigeria 1; fname N=18, India 12, West Africa 4	D. in India / Liberia
Achile	Achil N=298, Haiti 108, Malaysia 45, Nigeria 37, DR Congo 21; Afghanistan 20; fname N=2604, DR Congo 1746, Cameroon 325, Ivory Coast 118, Uzbekistan 78, India 44	Nigeria(2), Sudan ; D. in Haiti / DR Congo

	Akile N=5509, Nigeria 3248, Israel 1128, Tanzania 418, Ivory Coast 182, Morocco 170, India 122; fname N=9826, Turkey 7994, Nigeria 392, Northern Cyprus 382, Uganda 252	D. in Israel / Northern Cyprus
Aivas	Aivas N=98, India 24, Ecuador 14, Brazil 13, Paraguay 12, Ukraine 12, Papua NG 10; fname N=155, India 118, Uganda 19, Ukraine 4 Russia 3, Lithuania 2	Micronesia , D. in Paraguay / Georgia
Amuke	Amuke N=193, Nigeria 131, Uganda 43, Kenya 12; fname N=77, Nigeria 39, Papua NG 28, Indonesia 8, South Africa 1, Uganda 1	China , D. in Uganda / Papua NG
Amuce	Amuce N=129, Turkey 125, Sweden 4; fname Nigeria 4/4	D. in Turkey / Nigeria
Atmite	Atmit N=168, Thailand 167, Canada 1; fname N=3, India 2, Indonesia 1	Austria , D. in Thailand / Indonesia
Capne	Capne USA 1/1; fname N=0	Canada, Mexico, D. in India / nil
	Capnemakaji N=0; fname India 3/3	D. in nil / India
	Capnekahar N=0; fname India 1/1	D. in nil / India
	Kapne N=30, India 19, Papua NG 9; fname N=3, France 2, Indonesia 1	D. in Papua NG / France
Cerca	Cerca N=2499, Angola 1578, Portugal 311, Brazil 222; fname N=17, Brazil 7, Italy 2, USA 2	Angola , Haiti (5), Spain (2), Portugal (9), Brazil (2), Bolivia; D. in Angola / UAE
Easun	Easun N=61, Canada 42, India 6, Monaco 5; N=19, India 14, USA 2	D. in Monaco / India
Ecapa	Ecapa India 505/505, fname N=21,929, India 21,928, Mexico 1	D. in India / India
Ectur	Ectur Argentina 1/1	D. in Argentina
Elina	Elina N=1767, Indonesia 812, DR Congo 260, India 77, Mauritania 60, Turkey 54, Russia 44; fname 281,077, Russia 73,323, Tanzania 20,964, Zambia 18,686, Finland 18,168	Cuba , Uzbekistan ; D. in Finland / Mauritania
Epiur	Epiur N=0; fname Indonesia 5/5	D. in Indonesia
Etule	Etule N=53, DR Congo ; fname N=58, Cameroon 56, Kenya 1, Nigeria 1	DR Congo D. in DR Congo / Cameroon
Latva	Latva N=812, Finland 565, USA 185, Sweden 26; fname N=9, USA 5, India 4	Corded Ware Russia (4), Belarus , Finland (4); D. in Finland / USA
Lnche	Lncheva surname Bulgaria 2/2	D. in Bulgaria
	Lnchekel Algeria 1/1; fname N=0	D. in Algeria
Memnum	Memnu N=0, fname N=21, India 17, Turkey 4	D. in nil / Turkey
Memrum	Memru Ethiopia 1/1; fname N=0	D. in Ethiopia / nil
Menle	Menle N=43, India 33, USA 6; fname Menle N=13, India 4, Philippines 4, USA 4, China 1	D. in Azerbaijan / Philippines
Metua	Metua N=450, French Polynesia 246, Philippines 88, New Caledonia 47; fname N=135, Cook Islands , New Zealand 40, USA 7, India 3, Papua NG 3	D. in Cook Islands
Metvia	Metvi N=0; fname India 1/1	D. in nil / India
Perse	Perse N=1358, Iran 464, USA 256, Romania 138; Turkey 113, Ireland 70; N=562, DR Congo 431, Philippines 38, USA 20	Iran , Slovakia , Slovenia , Latvia , Afghanistan ; D. in Ireland / DR Congo
Phamu	Phamu India 9/9; fname N=91, India 63, Zimbabwe 21, Nepal 4, South Africa 2, Zimbabwe 1	D. in Zimbabwe
Phaun	Phaun N=6, USA 5, Thailand 1; fname N=23, India 13, USA 6, Thailand 3	D. in Cambodia
Semla	Semla N=680, Poland 421, Tanzania 124, USA 57, Papua NG 26; fname N=330, India 265, Indonesia 18, Papua NG 11, Chad 9, Turkey 6	Sweden , India (15); D. in Poland / Papua NG
Sispe	Sispe N=0; fname DR Congo 1/1	D. in DR Congo
Tages	Tages N=166, Brazil 52, USA 49, Argentina 30, Spain 11, Ethiopia 9, Iran 5; fname N=39, Brazil 14, Ethiopia 9, India 5, Papua NG 4, Israel 2	Spain ; D. in Papua NG
These	These N=337, India N=238, DR Congo 123, Nepal 22, Congo 17, India 17, Germany 16	D. in French Polynesia / Congo
Tuntle	Tuntler N=8, Australia 7, Netherlands 1; fname N=0	D. in Australia
Urphe	Urphe N=0; fname N=3, Philippines 2, Congo 1	France ; D. in Congo
Vilae	Vilae N=10, Romania; fname N=4, USA 2, India 1, Papua NG 1	D. in Romania / Papua NG
Very short names (none)		
No appearance: Alcstei Alcsti Elchsntre Caŋtra Cilens Clutmsta Heiasun Epeur Mlacuch Patrucle Teriasals Uthste, Evtucle, Priumne		

Appendix table 40: Regional summary of the appearance of Etruscan names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	3	3	6	3	12	15	6	15	21
Corded Ware Europe	2	0	2	2	11	13	4	11	15
Kurgan Europe	1	0	1	0	1	1	1	1	2
Balkans	4	0	4	1	0	1	5	0	5
Middle East	4	0	4	2	0	2	6	0	6
Central and Northern Asia	3	0	3	0	1	1	3	1	4
Gedrosia	0	0	0	1	2	3	1	2	3
India, Nepal, Sri Lanka	23	0	23	18	15	33	41	15	56
Indochina	0	0	0	1	0	1	1	0	1
Sundaland	13	0	13	7	1	8	20	1	21
China etc.	0	0	0	0	1	1	0	1	1
Japan and Koreas	1	0	1	0	0	0	1	0	1
East Africa	4	0	4	1	1	2	5	1	6
Maghreb	0	0	0	1	0	1	1	0	1
West Africa	11	0	11	5	2	7	16	2	18
Central and South Africa	8	1	9	6	2	8	14	3	17
Greece and Egypt	3	0	3	0	0	0	0	0	0

Appendix table 41: Geographical distribution of Legendary Catalan names

	Anthroponyms	Places
Ariphi	Ariphi N=12 India 8, Thailand 4; fname India 11/11	D. in Thailand / India
Basque	Basque N=4839, Canada 2452, France 1488; fname N=54, Afghanistan 21, Iraq 14	France (3); D. in Canada & France / Afghanistan & Iraq
	Baskue India 4/4; fname N=0	D. in India/nil
	Pasque N=524, USA 168, Belgium 111, France 105; fname N=81, Italy 65, USA 9, DR Congo 4;	Italy (2), D. in Belgium / Italy
Bithynias	Bithyni Congo 1/1, fname N=0	D. in Congo /nil
	Bithynia N=0; fname N=7, USA 4, Philippines 2, Venezuela 1	D. in nil/Venezuela & Philippines
	Bithynie N=0; fname Cameroon 1/1	D. in nil/Cameroon
Cetubales	Cetubal N=14 Philippines 8;	D. in Philippines / nil
	Ketubala N=0; fname N=148, India 144, UAE 4	D. in nil / UAE
	Ketubali N=0; England 1/1	D. in nil / England
	Cetubaliram N=0; forename India 1/1	D. in nil / India
Fantonya	Fantony N=93, USA 32, Philippines 28, Indonesia 26; forename N=21 Indonesia 15, Brazil 1, China 1, Hong Kong 1, Peru 1, Uganda 1, Venezuela 1	D. in Switzerland & Philippines / Hong Kong & Indonesia
	Phantony N=0; fname Philippines 1/1	D. in nil / Philippines
	Fanton N=6637, Italy 3233; France 1221; fname N=87, Italy 41; Indonesia 12	France , China, South Sudan ; D. in Italy & France / Marshall Islands & Italy
Hettali	Hettali Algeria 1/1; fname N=0	D. in Algeria /nil
	Hetali N=19, India 18, Algeria 1; fname N=224, India 207, USA 10, Papua NG 6, Wales 1	Hetalia(locality, Bangladesh); D. in Algeria /Papua NG
	Heddali India 10/10; fname Mexico 1/1	D. in India/Mexico
Iberian	Iberian Malaysia 1/1; fname N=9, India 5, Brazil 2, Luxemburg 1, Spain 1	D. in Malaysia / Spain & Luxemburg
	Iberia N=29, Nigeria N=29, Nigeria 24, Kenya 2, Spain 1; fname N=121, Indonesia 557, USA 146, Brazil 93, Colombia 65	Spain/Portugal , Georgia , Morocco ; D. in Nigeria/Bermuda
	Iperia DR Congo 4/4; fname N=8; Indonesia 7, USA 1	Greece ; D. in DR Congo / Indonesia
Japteth	Japteth N=0, Forename Malaysia 1/1	D. in nil/Malaysia
	Japteht N=0; Forename Papua NG 3/3	D. in nil/Papua NG
	Japtet Nigeria 7/7; fname N=0	D. in Nigeria / nil
Khasheh	Khasheh N=92, Iran 85, Pakistan 7; forename N=10, Iran	Iran ; D. in Iran & Pakistan / Iran
	Kasheh N=79, Iran 52, Israel 21, Afghanistan 6; fname N=10, Afghanistan 3, Pakistan 3, Iran 2, Israel 1, Saudi Arabia 1	Kasheh (locality, Iran); D. in Israel/Israel
	Khasheha N=0; fname India 1/1	D. in nil/India
	Khashehi Finland 1/1; fname N=0	D. in Finland /nil
Meshech	Meshech N=40 Nigeria 23, Papua New Guinea 17; forename N=109 Nigeria 48, India 22	D. in Papua NG & Nigeria / Grenada & Liberia
	Meshesh N=1 Nigeria 1, Ethiopia 1; fname N=17, Ethiopia 9, India 7, Venezuela 1	D. in Ethiopia/Ethiopia
Phanatonova	Phanaton N=4, Thailand ; forename N=0	D. in Malaysia / Thailand
	Fanaton N=0, fname Indonesia 32/32	D. in nil / Indonesia
Sabino	Sabino N=164,891, Brazil 93,760, Angola 21,494, Mozambique 13,596; fname N= 130,578, Mexico 34,154, Peru 16,751, Angola 12,147	Corded Ware Russia , Italy , Mozambique , Congo ; D. in Angola & Mozambique / Bolivia & Angola
	Sapino N=1162, Italy 666, Argentina 206, Philippines 170; fname N=59, Indonesia 20, Papua NG 14, Italy 10, Philippines 6	Corded Ware Russia(2), D. in Micronesia / Micronesia & Papua NG
Tarraho	Tarraho N=0; forename N=0	Somalia
	Taraho Cameroon 1/1; fname N=3, Burkina Faso 1, India 1, Pakistan 1	D. in Cameroon / Burkina Faso
	Tarrahotte N=0; forename Mauritius 1/1	D. in nil / Mauritius
Tofail	Tofail N=2653 Pakistan 1,384; forename N=7749 Bangladesh 7,057	D. in Kuwait , UAE & Pakistan / Bangladesh & UAE
	Tophail India 1/1; fname N=3, India 1, Philipp 1, Uganda 1	D. in India / Uganda
14 name families, 59 names (38 long, 18 short, 3 very short)		
Aitor	Aitor N=49 Spain 27, Morocco 9, Thailand 4, India 3; forename N= 52,307, Spain 51,032, Thailand 153	D. in Spain & Morocco / Spain & Thailand
	Aidor N=4, Niger 2, England 1, Spain 1; fname N=96, Argentina 69, USA 8, Finland 5	D. in Niger / Argentina
	Aitore Kazakhstan 42/42; forename N=86 Kazakhstan 85, Papua NG 1	D. in Kazakhstan / Kazakhstan & Papua NG
	Aitoris N=0; forename India 19/19	D. in nil / India
Atipa	Atipa N=183 Papua New Guinea 61; fname N=862, India 360, Indonesia 220, Thailand 198, Papua NG 29	Uganda ; D. in Surinam & Papua NG / North Macedonia & Papua NG
	Atiba N=3307, Nigeria 2031, Egypt 244, Morocco 239, Uganda 202, Malawi 157; fname N=Trinidad and Tobago 555, USA 503, India 283, Indonesia 278	Atiba(district, Nigeria), Atibá (neighbourhood, Portugal), Atigba(locality, Togo), Atiba (village, Nigeria), Atiba(locality in China), al 'Āṭibah(historical site, Yemen), Atiba(locality, Cameroon); D. in Trinidad and Tobago / Trinidad and Tobago
Ariphi	Arifi N=20,725, Kosovo 4771, Morocco 2624, Sudan 2520, Algeria 2405; fname N=1078, Indonesia 343, North Macedonia 275, Morocco 218, Iraq 53, India 44	Arifiye(city, Turkey); D. in Kosovo /North Macedonia
Eteva	Eteva N=42, India 39, Bulgaria 3, fname N=6083, India 6066	D. in Bulgaria & India / India & Albania
	Edeva N=8, India 6, Russia 1, Tanzania 1; fname N=103, India	D. in Tanzania / Benin
Kesed	Kesed N=23 Indonesia 22; fname N=8 Brazil 2, USA 2, India 1	Iran ; D. in Indonesia & Pakistan / Venezuela & Philippines
	Keset N=15, Ukraine 10, Papua NG 2, Sweden 2, Eritrea 1; fname N=12, Papua NG , England 1, India 1, Malaysia 1	Keset(hamlet, Sweden), Keset(locality, Indonesia), Kését(wadi, Niger); D. in Papua NG/Papua NG

Morar	Morar N=24,268, Romania 14,041, Russia 2,009, Ukraine 1856, South Africa 1065; forename N= 484, India 413, Enland 23, Pakistan 6, Romania 6	India (3) , Italy (3) , Scotland , Pakistan , Ethiopia ; D. in Transnistria & Romania / Scotland & England
	Moraar N=0, fname N=2, India 1, USA 1	D. in nil / USA
Pheed	Pheedi South Africa 86/86; forename South Africa 43/43	D. in South Africa / South Africa
Taari	Taari N=261, Finland 132, Sweden 25, India 19, Pakistan 15, Niger 13; forename N=371, India 213	Estonia ; D. in Finland & Kosovo / French Polynesia & Indonesia
	Daari N=2112, Pakistan 1676, Ghana 346, Niger 28, India 26, Indonesia 13, Nigeria 8, Benin 7, Afghanistan 2, Uganda 2; fname N=5213, India 3754, Pakistan 1114, Indonesia 209, Burkina Faso 106	Daaridaba(hill, Eritrea); D. in Ghana/Burkina Faso
Tubal	Tubal N=4048, Philippines 3427, Israel 321, Portugal 104; fname N=902, Israel 324, India 143	Ukraina , Indonesia ; D. in Israel & Philippines / Israel & Marshall Islands
	Tupal N=1121, Philippines 672, Afghanistan 170, Turkey 108, India 62, Indonesia 54; fname N =254, India 169, Indonesia 63, Afghanistan 7, Nepal 6	Nigeria , Albania ; D. in Philippines / Papua NG
Very short names		
Aspa	Aspa N=4724, Philippines ; fname N=1773, Indonesia	Spain(2), Liechtensten, Corded Ware Russia(3), Iran, Pakistan, Kazakhstan, Sweden(5), Denmark, Norway(2); D. in Philippines & Finland / Faroe Islands & Greece
	Asba N=414, Seychelles 241, Indonesia 92, Cameroon 26, India 9; fname N=2035, India 636, Indonesia 623, Chad 371, Philippines 171, Pakistan 158	D. in Seychelles / Chad
Iber	Iber N=1780, Nigeria ; fname N=3325, Bolivia 1075	Germany(2), Serbia, Nigeria(2), Bulgaria, Morocco; D. in Austria & Nigeria / Bolivia & Kosovo

Appendix table 42: Regional summary of the appearance of Ancient Catalan names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	7	8	15	2	4	7	9	12	21
Corded Ware Europe	1	3	4	2	2	4	3	5	8
Kurgan Europe	0	0	0	2	1	3	2	1	3
Balkans	1	1	2	0	1	1	1	2	3
Middle East	0	2	2	1	0	1	1	2	3
Central and Northern Asia	0	0	0	2	0	2	2	0	2
Gedrosia	6	1	7	1	2	3	7	3	10
India, Nepal, Sri Lanka	10	1	11	10	2	12	20	3	23
Indochina	2	1	3	0	0	0	2	1	3
Sundaland	12	0	12	6	2	8	18	2	20
China etc.	0	1	1	0	1	1	0	2	2
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	1	2	3	1	3	4	2	5	7
Maghreb	1	1	2	0	0	0	1	1	2
West Africa	6	0	6	2	6	8	8	6	14
Central and South Africa	4	2	6	2	0	2	6	2	8
Greece and Egypt	0	1	1	0	0	0	0	1	1

Appendix table 43: Geographical distribution of ancient Druidic names

White names selected from Kidald.com, orange names added based on Pathmanathan (1979, 29).

	Personal forenames	Place names
Amergin Irish	Amergin N=2, Ireland 1, Russia 1; fname N=3, British Isles 2, South Africa 1, Sweden 1, USA 1	D. in Ireland/Ireland
	Amerkin Uganda 1/1; fname N=0	D. in Uganda /nil
Anmann Druid/Drav.	Anmanna India 5/5; fname India 2/2	D. in India/India
	Anmannannem N=0; fname Nigeria 1/1	D. in nil/Nigeria
Balfor Gaelic	Balfor N=18, USA 8, Chile 6, Canada 1, Haiti 1, Italy 1, Russia 1; fname N=28, Nicaragua 12, Chile 11, Canada 1, Honduras 1, Jamaica 1, Panama 1, South Africa 1	D. in Chile/Nicaragua
	Balfore N=34, USA 20, India 7, England 4; fname N=23, Jamaica 20, Canada 1, Libya 1, USA 1	D. in Cayman Islands/Jamaica
	Palfor N=0; fname N=0	D. in nil/nil
Ballar Gaelic	Ballar N=1047, Philippines 372, Turkey 211, USA 128, India 111, Costa Rica 87, Argentina 48, Pakistan 32; fname N=499, India 444, Turkey 29, Pakistan 6, Papua NG 5, Nigeria 3, USA 3, Azerbaijan 2	Ballar(village, Afghanistan), Ballar(village, Turkey), Ballar(village, Azerbaijan), Ballarpur(town, India), Ballar(town, India), Ballar(village, India), Balar(locality, India), Ballar(neighbourhood, Turkey), Ballar(locality, Pakistan), Ballar(locality, Turkey); D. in Costa Rica / Trinidad and Tobago

	Ballari N=18,432, India 17,410, Argentina 364, Italy 359, Morocco 136; fname N=2129, India 2108, USA 7, England 6	Ballari(district, Karnataka, India), Ballari(Andra Pradesh, India), Ballari(hamlet, Niger), Ballari(locality, Italy); D. in India/India
	Pallar N=1351, Philippines 848, India 397, Brazil 42; fname N=191, India 138, Liberia 45, UAE 4	Pallārguda (Locality, India); Sikkal Pallar St (locality, India), Pallar (locality, Cameroon), Pallare (village, Italy), Pallaripalayam (locality, India); D. in Philippines/Liberia
Brenonna Gaelic	Brennon N=429, USA 309, South Africa 60, England 33, Australia 14, Canada 4; fname N=1092, USA 881, Brazil 81, South Africa 40, Canada, Trinidad and Tobago, England, Malaysia, Philippines	Brenon (locality, France), Brenon (Village, France ; Stream, France), D. in South Africa /Anguila
Callaghan Druid/Drav.	Callaghan N=40,485, England 10,803, USA 9282, Australia 6027, Ireland 4654, Canada 3065, Scotland 2295; fname N=131, USA 27, South Africa 24, Croatia 16, Canada 13, Australia 10, Zambia 9, England 6	Sallaghan (suburb, Australia); D. in Ireland/Anguilla
	Kallaghan N=18, England 10, Canada 3, Australia 2, USA 2, Russia 1; fname N=0	D. in England/nil
Cathbad	Cathbade N=0; fname Malawi 1/1	D. in Malawi
Old Irish	Cathbat N=0; fname Solomon Islands 1/1	D. in Solomon Islands
Chossak Gaelic	Chossan Israel 244/244	D. in Israel
	Khossa N=8087, Mozambique 8034, Pakistan , India, South Africa, Zimbabwe, England, Russia, Algeria; fname N=4, Ivory Coast 2, Brazil 1, Russia 1	D. in Mozambique/ Ivory Coast
Conroy Druid/Drav.	Conroy N=47,340, USA 24,157, England 7236, Ireland , Australia, Canada, Scotland, New Zealand; fname N=2596, Jamaica 813, USA, South Africa , England , Canada	D. in Ireland/Anguilla and Barbuda
	Konroy N=25, USA 23, Canada 1, England 1; fname N=4, England 2, Jamaica 1, USA 1	D. in USA/Jamaica
Dubhtach Celtic	Dubtach N=0, fname Philippines 1/1	D. in nil/ Philippines
Druidia Celtic	Druidic N=0, fname Wales 1/1	D. in Wales
	Druidi N=87, Italy 72, Germany 9, Venezuela, Thailand; fname N= Italy , Germany	Druidiques(ruins, France), Druidibeg(UK), Druidi(ruins, Italy), Druidical (arch.site, UK), Druidi(cave, Italy), Druidique (arch., France), Druirical(Ireland), Druidique(arch. France); D. in Italy / Italy
	Truidie N=0; fname South Africa 9/9	D. in nil/ South Africa
Fidelma Irish	Fidelma N=37, Papua NG 28, Nigeria 4, Ireland 3, Kenya 1, New Zealand 1; fname N=414, Papua NG , Ireland, England, USA, Italy	D. in Papua NG/Ireland
	Fitelma N=0; fname Papua NG 3/3	D. in nil/ Papua NG
Manannan Druid/Drav.	Manannan N=12, India 11, USA 1; fname N=5, India 4, England 1	D. in India/England
	Mananan N=164, India 130, Pakistan 20, Ivory Coast 6, Philippines, Nigeria, England, South Africa, Togo; fname N=262, India 200, Ivory Coast , Pakistan, Nepal, USA	Mananan(village, Chad), Manan'an(locality, China); D. in Ivory Coast/Ivory Coast
Morgan	Morgan N=626,804, USA 364,268, England 82,192, Wales 34,360, Australia 33,813, Canada 20,582, Jamaica 16,247, South Africa 8831; fname N=233,117, USA 73,460, Nigeria 63,611, Zambia 20,579, Kenya 11,805, France 8551, South Africa 6354.	D. in Wales/Niue
Mongan Druid/Drav.	Mongan N=3421, USA 1274, Indonesia 504, England 492, Ireland 391, Australia, Northern Ireland, Philippines, Nigeria, Liberia, Scotland; fname N=396, India 319, Indonesia 41, Nigeria, Philippines, USA, Papua NG	D. in Ireland/ Papua NG
	Monkan N=1112, Ivory Coast 42, Norway 30, USA 25, Thailand, Malaysia; fname N=178, Ivory Coast 95, Thailand 70, Cameroon 4, Benin 3, Papua NG	Monkan(hill, Norway), Mon Kan (locality, Myanmar); D. in Norway/Ivory Coast
Muirgen Druid/Drav.	Muirgen N=0; fname England 2/2	D. in nil/England
Murugan Druid/Drav.	Murugan N=30,690, India 13,381, South Africa 3014, Saudi Arabia, Malaysia, UAE, Oman Sri Lanka, Singapore, Kuwait, Qatar; fname N=31,071, India 21,126, Malaysia , Saudi Arabia, UAE, Qatar, Sri Lanka, Oman, Kuwait, USA, South Africa	Murugan (peak, Basque country), Murugan (many temples in India, not included); D. in Mauritius / Qatar
Myrrdin Welsh	Myrrdin N=37, Russia 25, Kazakhstan 9, Afghanistan 1, France 1, USA 1; fname N=5, USA 2, Germany-Netherlands 2, Russia 1	Myrrdin(house, Wales); D.in Kazakhstan/ Netherlands
Tennisan Druid/Drav.	Tennisan India 2/2; fname N=26, India 25, Japan 1	D. in India
	Dennisan N=25, India 23, Malaysia 1, USA 1; fname N=342, India 341, Malaysia 1	D. in Malaysia /India
Tennyson Druid/Drav.	Tennyson N=8108, USA 5441, Ghana 554, Nigeria, England, Northern Ireland, Canada, Australia, India, Ireland; fname N=4733, Zimbabwe 1326, Nigeria , USA, South Africa, India, Malawi	D. in Northern Ireland / Barbados
	Dennyson N=44, South Africa 15, India 11, England 6, Scotland 6, Kenya 4, Australia 1, New Zealand 1; fname N=333, Brazil 245, India 30, Venezuela, Philippines, Zambia , Malaysia, Nigeria, South Africa, USA, Chile	D. in Scotland/Grenada
Taliesingam Welsh	Taliesin N=18, USA 11, Canada 2, Brazil 1, Cambodia 1, England 1, France 1, India1; fname N=103, USA 41, Wales , 23, England 17, Canada 7, Russia 3, Australia 2, Brazil 2	D. in Cambodia/Saint Vincent and the Grenadines
	Talising N=0; fname India 1/1	D. in nil/India
	Singam N=19,013, India 11,032, Thailand 6163, Sri Lanka 658, Malaysia 472, Indonesia 122; fname 3019, India 2792, Thailand 112, Malaysia 42, Papua NG 20	Singham(hamlet, Germany); D. in Thailand/Papua NG
27 name families, 55 names (41 long, 13 short, 1 very short)		
Anmann Druid/Drav.	Anman N=575, Iran , Niger , Turkey, Papua NG, Pakistan, Russia, USA; fname N=1183, China, India, Taiwan, Iran	Anman(Pass, Pakistan); D. in Niger /Armenia

Aoife Irish	Aoife N=6, England 2, Ireland 1, Brazil 1, New Zealand 1, USA 1; fname N=8387, Ireland 5977, England 870, Thailand, USA, Australia	D. in New Zealand/Ireland
Druidia Celtic	Druid N=355, Ivory Coast , Sweden 60, Venezuela, Kenya; fname N=82, USA, Ivory Coast 88, USA, 36, Russia 35, China, England, India, Belarus, Canada, France, Kyrgyzstan	Druid(hamlet, UK), Druid(hamlet, Scotland); D. in Ivory Coast/Ivory Coast
	Truid USA 1/1; fname N= England-France 2	D. in USA/England
Emrys Welsh	Emrys N=82, USA 39, Wales 14, England 7, Ghana 4, Russia, Australia, Brazil; fname N=1740, Wales 792, Ghana 393, England 305, USA, Australia, Canada, Netherlands, Israel, South Africa, Malawi	Emrys(ruins, UK); D. in Wales/Falkland Islands
Madan Druid/Drav.	Madan N=52397, India 38,236, USA 1992, Turkey 1853, Pakistan 1273, Moldova, Bahrain, Saudi Arabia, Cuba, Iran, UAE; fname N=882,209, India 830,207, Nepal 38,512, Pakistan, Saudi Arabia, USA, Bangladesh	Madang(town, Papua NG), Ma'adan(town, Syria), Madan (town, Bulgaria), Madani (city, Sudan), Madan Upazila(town, Bangladesh), Madanpur (town, India), Madan (village, Iran), Madan (town, China); D. in Bahrain/Nepal
	Matan N=15,123, Somalia 6911, Somaliland 1724, Vanuatu 787, India 676, Kenya, Thailand, Poland, Philippines, Indonesia, USA; fname N=38,937, India 21,889, Israel 12,173, Somalia 1237, Indonesia, Pakistan, Niger, USA, Azerbaijan, Thailand, Papua NG	D. in Vanuatu/Israel
Nesan Druid/Drav.	Nesan N=2269, India 1017, Sri Lanka 658, Indonesia, Malaysia, Iran, USA, Canada; fname N=1975, Indonesia 888, India 494, Philippines, Iran, South Africa, Malaysia, UAE	Nesan (locality, Norway), Nesan (hamlet, Norway); D. in Sri Lanka/Qatar
	Neesan N=160, USA 133, Netherlands 13, Denmark 6, England 2, Pakistan 2, Ireland 1, Afghanistan 1, India 1, Maldives 1; fname N=15, India 4, Maldives 2, Pakistan 2, Philippines 2, Thailand 2, Bhutan 1	D. in Maldives/Maldives
Dennyson	Tenny N=1413, USA 1006, Papua NG 83, Indonesia 64, England 51, Mauritius 41; fname N=4478, Indonesia 2286, USA 746, Philippines 320, India 189, Nigeria 171, Papua NG 112, Malaysia 96	D. in Mauritius/Marshall Islands
Wynna Welsh	Wynna N=2, Canada 1, USA 1; fname N=202, Philippines 69, USA 66, Indonesia 28, Brazil, Canada, Qatar, Liberia, Malaysia	D. in Canada/ Qatar
	Winna N=1069, Burkina Faso 709, Poland 89, Thailand, Indonesia, Austria, Papua NG, Niger, Malaysia, Nigeria, Liberia; fname N=2560, Indonesia 1185, Philippines 338, Thailand, USA, India, Malaysia, Papua NG, China	Winna(village, Poland), Winna(village, Swietokryzskie, Poland), Winna(Peak, Poland), Winna(peak, Nowy Sacz, Poland); D. in Burkina Faso/Nauru
	Vinna N=316, India 202, Indonesia 52, Brazil, USA, Papua NG, Norway, Russia; fname N=4199, India 2310, Indonesia 1226, Philippines 218, USA 143, Burkina Faso, Nepal, South Africa, Cambodia, Zimbabwe	Vinná (Hamlet, Chzecia), Vinna(locality, Sweden), Vinna(island, Norway), D. in Iceland/Liberia & Iceland
Very short names		
Gael Irish	France, DR Congo, Spain, Madagascar, Cameroon, Brazil, Gabon	Gael(locality, France), D.in Gabon
No appearance: Tlachtga		

Appendix table 44: Geographic summary of the distribution of ancient Druidic names

Region	Long names			5 letter names			Total names		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	13	15	28	6	3	9	19	18	37
Corded Ware Europe	1	1	2	0	2	2	1	3	4
Kurgan Europe	0	0	0	0	0	0	0	0	0
Balkans	0	0	0	0	1	1	0	1	1
Middle East	1	5	6	0	1	1	1	6	7
Central and Northern Asia	0	0	0	0	0	0	0	0	0
Gedrosia	0	2	2	1	2	3	1	4	5
India, Nepal, Sri Lanka	20	10	30	7	1	8	27	11	38
Indochina	0	1	1	0	1	1	0	2	2
Sundaland	8	0	8	5	1	6	13	1	14
China etc.	0	1	1	1	1	2	1	2	3
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	1	0	1	1	1	2	2	1	3
Maghreb	0	0	0	0	0	0	0	0	0
West Africa	6	3	9	3	0	3	9	3	12
Central and South Africa	9	0	9	0	0	0	9	0	9
Greece and Egypt	0	1	1	0	0	0	0	1	1

Appendix table 45: Geographical distribution of the names of 47 Norse gods

	Anthroponyms	Place names
Dellingr	Dellinger N=1,920; USA 10,683; France 568; fname N=28, USA 14, Dominican Republic 4, Peru 3, Brazil 2, Venezuela 2, China 1, Ivory Coast 1, Philippines 1 Tellingr N=199, Germany 55, USA 39, Hungary 37; fname N=0	D. in USA / Dominican Republic D. in Hungary / nil
Eostre	Eostre N=0; forename N=2, Philippines 1, USA 1	D. in nil / Philippines
Forseti	Forseti N=15, Russia 8, Belarus 1, England 1, Italy 1, Romania 1; fname N=3, Philippines 2, Russia 1 Forset N=22, Norway 14, USA 3, Russia 2; fname N=9, Egypt 4, Cameroon 1, Russia 1, South Africa 1, USA 1, Zimbabwe 1	D. in Belarus / Philippines Forset(village, Norway), Forset (hamlet, Norway), Forset(neighborhood, Norway), Forset(hamlet, Norway), Forset(locality, Trondelag, Norway), D. in Norway/Zimbabwe
Freyja	Freyja N=8, England 3, Israel 3, Kenya 1, Poland 1; fname N=761, Iceland 240, England 103, USA 98, Germany 94, Canada 36, Sweden 21 Freyjasol N=0; fname Thailand 1/1	D. in Iceland / Iceland D. in nil / Thailand
Gefjun	Gefjun N=0; fname Netherlands 1/1	D. in nil / Netherlands
Gersemi	Gersemi N=0; forename N=11, Brazil 6, Denmark 5	D. in nil / Denmark
Gullveig	Gullveig N=0; forename N=111, Sweden 56, Norway 45	D. in nil / Sweden
Hariasa	Hariasa Indonesia 12/12; fname Indonesia 18/18	Indonesia; D. in Indonesia
Heimdallr	Heimdall N=4, Russia 2, Brazil 1, Switzerland 1; fname N=36, Germany 9, USA 7, Brazil 6, Venezuela 4, England 2, Mexico 2, Nicaragua 2, Spain 2	D. in Switzerland / Nicaragua
Hludana	Hludani South Africa 7/7; forename South Africa 1/1 Hlutana South Africa 1/1; fname N=0 Ludana N=192, Philippines 161, Tanzania 13, Indonesia 8, Ukraine 8, Qatar 1, South Africa 1; fname N=26, USA 12, India 5, Tanzania 5, Georgia 2	D. in South Africa / S.Africa D. in South Africa/nil Ludhana(locality, India); D. in Philippines/Georgia
Hoenir	Hoenir N=0; forename N=3 Brazil 2, England 1	D. in nil / England
Hretha	Hretha N=0, forename South Africa 1/1	D. in nil / South Africa
Lourss	Lourssi Algeria 2/2; fname N=0	D. in nil / Algeria
Nehallenia	Nehallenia N=0, forename N=1, Brazil 1 Nehalania N=0; fname N=22, Mexico 21, Venezuela 1	D. in nil / Brazil D. in nil/Mexico
Nerthus	Nerthus N=0, forename Philippines 2/2 Nertus N=0, fname N=3, Indonesia 2, India 1	D. in nil / Philippines D. in nil/Indonesia
Saxnöt	Saksno India 1/1; fname N=0	D. in Azerbaijan/nil
Snotra	Snotra N=39, India 19, England 12, Kazakhstan 4; fname N=0	Snättra (islet, Norway); D. in Estonia / nil
Tamfana	Tamfana N=0, fname N=2, South Africa 1, Zimbabwe 1	D. in nil / Zimbabwe
Viðarr	Vioare N=25, Russia 23, Moldova 2; forename N=0	D. in Moldova / nil
47 name families, 55 names (22 long, 33 short, 0 very short)		
Æsir	Aesir N=28, Indonesia 19, Poland 2, Thailand 2; Norway 1, Spain 1, USA 1; fname N=3, Philippines 2, Scotland 1. Aashir N=103, Pakistan 80, India 15, USA 2; fname N=602, Pakistan 480, India 71, USA 25, UAE 11, England 3, China 2, South Africa 2, Thailand 2	D. in Norway & Indonesia / Scotland & Philippines D. in Pakistan & Mongolia / Pakistan & UAE
Alcis	Alcis, N=76, Haiti 57, Spain 10; fname N=191, Americas (many), Philippines 12 Alkis N=304, Germany 56, USA 55, Indonesia 35, Belgium 28, Greece 28, Philippines 24, Cyprus 20; fname N=1801, Greece 1143, Cyprus 276	D. in Haiti / San Lucia D. in Cyprus/Cyprus
Baldr	Baldr N=0, fname 12, Russia 5, Taiwan 3, Netherlands 3 Baltr USA 1/1; fname India 1/1	D. in nil / Taiwan D. in USA/India
Beyla	Beyla N=80, Mauritania 25, Ivory Coast 19, Burkina Faso 11; fname N=286, Venezuela 92, USA 76, India 45, Brazil 17, Turkey 9, Russia 8 Peyla N=328, USA 138, Argentina 76, Iran 64, Italy 20, France 10, Switzerland 9, India 8; fname N=13, Ivory Coast 6, USA 3, India 1, Italy1, Papua NG 1, Zambia 1 Beila N=306, DR Congo 116, Cameroon 59, Ivory Coast 35, Ukraine 23; fname N=8142, India 5795, Ukraine 898, Israel 669, Venezuela 299	Beyla(prefecture, Guinea), Beyla(town, Guinea), Baylah(hamlet, Sudan); D. in Mauritania / Venezuela & Sweden Pèyla (locality, Burkina Faso); D. in Argentina/Ivory Coast Beila(hamlet, Mauritania), Beila(locality, China); D. in Moldova/Israel
Baduhenna	Henna N=4005, Egypt 1065, Japan 1011, Algeria 658, UAE 228, USA 173, India 149, Morocco 136, South Africa 83, Israel 82; fname N=15,424, Finland 8929, India 1403, Suriname 790, USA 626, England 625, Netherlands 542, Indonesia 359, Egypt 260, South Africa 259	Henna(locality, Iran), Henna(village, Finland), Henna(quarter, Japan), Henna (hamlet, Norway), Hennah (peak, New Zealand); D. in UAE & Algeria / Finland & Suriname
Bragi	Bragi N=58, USA 15, Iceland 8, Papua New Guinea 8, Indonesia 7; fname 328, Iceland 255, USA 18, Papua NG 9, Faroe Islands 8, Sweden 7, Denmark 6, Germany 3, India 3, Nigeria 3, Peru 3	Bragi(locality, Belarus), Bragi(hamlet, Pskov, Russia), Bragi(hamlet, Kirov, Russia), Bragi/Bargi (village, Finland), Bragioli (hamlet, Italy); D. in Iceland & Dominica / Iceland & Fär Islands

	Braki N=106, Argentina 57, Indonesia 27, Papua NG 8, USA 4, South Africa 3; fname N=69, South Africa 43, Zimbabwe 10, Benin 4, Indonesia 3, India 2, Nigeria 2, Papua NG 2	Braki (village, Poland), Braki (village, Latvia), D. in Argentina/ South Africa
	Pragi N=53, Estonia 38, India 12; fname 2559, India 2542, Nepal 5, Qatar 5, USA 2	Pragi (hamlet, Estonia), D. in Estonia / Qatar
Freyr	Freyr N=49, Iceland 24, Denmark 5, Russia 5, USA 3, Norway 2; fname N=168, Iceland 97, Mexico 21, Sweden 12	Freýr (hamlet, Belgium); D. in Iceland /
	Freir N=142, Ireland 57, USA 29, Scotland 17, Brazil 14; fname Russia 2/2	D. in Ireland/
Frigg	Frigg N=226, Switzerland 196, Northern Ireland 9, Russia 7; fname N=50, Norway 18, Denmark 10, China 5	D. in Liechtenstein & Switzerland / Norway
Fulla	Fulla N=1920, Philippines 461, Egypt 427, Tanzania 283, India 184, Spain 181; fname N=4149, India 3510, Egypt 586, Morocco 9	Fullà (village, France), Fulla (hamlet, Somalia), Fulla (hamlet, Italy); D. in Andorra, Tanzania, Slovakia / Egypt & India
Gerör	Geror N=49, USA 42, Philippines 2, Russia 2; fname USA 1/1	Geror (locality, Ethiopia); D. in Israel / USA
Haeva	Haeva N=1034, Ukraine 1014, Indonesia 11; forename N=143, Indonesia 136, India 6	D. in Ukraine / Indonesia
Hermóör	Hermor N=9, Israel 5, Mexico 2, England 1, Liberia 1; fname N=8, Philippines 6, Colombia 1, Venezuela 1	D. in Israel/Philippines
Hnoss	Hnoss, Israel 10/10; Hnoss, forename N=3, Israel 3	D. in Israel / Israel
Iöunn	Iounna Finland 3/3; forename N=0	D. in Finland / nil
	Iounnis N=0; forename England 1, USA 1	D. in nil / England
Magni	Magni N=28,615, Italy 20,902, Cameroon 3772, France 353, Peru 132, Switzerland 132, Ivory Coast 92, Spain 69, Mexico 69, Canada 59, Greece 54, India 53; fname 3956, India 1150, Ivory Coast 910, Benin 747, Norway 406	Magni (hamlet, Chad), Magni (locality, Senegal), Magnien (village, Mauritius), Magni (volcano, Iceland), Magni (mountain, Morocco); D. in Italy & Cameroon / Faroe Islands, Iceland & Benin
	Makni N=1293, Algeria 628, Tunisia 275, Morocco 136, France 80, Indonesia 39, Pakistan 19; fname N=628, Indonesia 269, India 221, Afghanistan 10	Makni (hamlet, Latvia), Makni or Mākni (Maharashtra, India(5)), Mākni(Gujarat, India), Makniwala (locality, Pakistan), Makniunai (Village, Lithuania); D. in Tunisia/ Tunisia
Mimir	Mimir N=239, Turkey 229, Russia 4, Indonesia 2; fname N=104, Indonesia 66, Philippines 15, India 11	Mimir/Kadiyusuf (town, Turkey), Mimirko (stream, Nepal), Mimirke (hamlet, Nepal), D. in Turkey / Mauritius
	Mimiira Uganda 2/2; fname N=0	D. in Uganda/nil
Meili	Meili N=3319, Switzerland 2281, USA 384; forename N=30,450, Taiwan 29,001, Indonesia 571, USA 300, Thailand 87	Meili(Town in Suzhou, China), Meili(Village in Liuzhou, China), Meili (reservoir, Fujian, China), Meili(peak, China); D. in Switzerland / Taiwan
Nanna	Nanna N=6907, Nigeria 1335, India 1299, Bangladesh 991, Italy 956; fname N=30,912, Denmark 7672, India 4049, Nigeria, 3150, Egypt 3080, Nepal 2576, Algeria 2207	Nanna(hamlet, Uttarakhand, India), Nanna(locality, Uttar Pradesh, India), Nanna(locality, Belarus); D. in Monaco / Denmark & Mauritania
Njörör	Njoro N=1271, Kenya 708, South Africa 490, Tanzania 34, Nigeria 12; forename N=36, Kenya 27, South Africa 3, Zimbabwe 2	D. in Kenya & South Africa / Kenya
Hretha	Retha N=130, Indonesia 60, USA 17, India 16, South Africa 7, England 6; fname N=12,498, USA 9284, South Africa 2201, Indonesia 434, India 212, Liberia 91	Retha (India); D. in Indonesia/Greenland
Rindr	Rindr N=0, forename N=27, India 13, Nepal 12	Rindra(locality, Madagascar), Rindra(locality, Pakistan); D. in nil / Nepal
	Rintr N=5, Cambodia 4, Thailand 1; fname Thailand 9/9	D. in Cambodia/Thailand
Sandraudiga	Sandra N=37,692, Indonesia 16,323, India 3344, Angola 3155, USA 2234, Chad 2118, Portugal 1425, Ghana 1178; fname N=5,314,745, Americas (many), Germany 298,185, France 179,842, England 175,867, Spain 113,906, Ghana 61,636, Nigeria 60,683, Angola 55,334, South Africa 46,789, DR Congo 41,449	Shandra (village, Ukraine), Sandra (village, Romania(2)); Sandrà(village, Italy), Sandra (hamlet, Estonia), Sandhra(village, India); D. in Chad / Chad, Indonesia, Portugal
	Santra N=206,378, India 204,804, Indonesia 1109, Saudi Arabia 159; fname N=16,435, India 15,926, Greece 118	Sāntra (locality, Chhattisgarh, India), Sāntra (locality, Madhya Pradesh, India), D. in India/India
	Sndra Pakistan 2/2; fname N=128, USA 63, Pakistan 22, Brazil 8, England 3, Nigeria 3	D. in Pakistan/USA
	Udiga N=661, India 657, Kenya 3, Nigeria 1; fname India 35/35	D. in India/India
Saxnöt	Saxno N=7, Azerbaijan 3, Russia 3, Argentina 1; fname N=0	D. in Azerbaijan/nil
Sigyn	Sigyn N=0, forename N=225, Sweden 148, Norway 19	D. in nil / Sweden
Sjöfn	Sjöfn N=0; forename N=91, Iceland 80, Sweden 6, Germany 2, Denmark 1, Norway 1, USA 1	D. in nil / Iceland
Skaoi	Skaoui N=11, Morocco 9, France 1, Norway 1; fname N=0	D. in Morocco
Sunna	Sunna N=2072, Bangladesh 541, India 288, Turkey 169, Saudi Arabia 159, Sweden 112; forename N=5986, India 3340, Iceland 609, Bangladesh 367, Tanzania 300	Sünna(village, Germany), Sunnansjö (village, Dalarna, Sweden), Sunnansjö (hamlet, Västerbotten, Sweden), Sunna/Sūnah (locality, Malawi), Sunna(hamlet, Uttarakhand, India), Sunna(village, Maharashtra, India), Sunna (locality, Bangladesh), Sunna (hamlet, Norway); D. in Qatar & Sweden / Sweden & Gibraltar
Tuisto	Duisto Spain 1/1; fname N=0	D. in Spain/nil
Vanir	Vanir N=141, India 126, Brazil 4, Canada 3, Israel 2; fname N=5,373, Brazil 5232, India 83, Russia 21	D. in Israel & India / Brazil
Viöarr	Vioar N=0; N=3, Philippines 2, India 1	D. in nil / Philippines

Woden	Woden N=520, Egypt 488, USA 15; forename N=41, Philippines 13	Woden (archaeological, England), Woden (town, Australia); D. in Egypt / Scotland
	Voden N=234, USA 109, England 55, Ukraine 32, Greece 23, Russia 10; fname N=18, South Africa 7, India 6	Voden (village, Bulgaria), Voden (locality, Bulgaria); D. in Greece / Sol. Islands & Bulgaria
Yngvi	Yngvi N=7, Sweden 6, Norway 1; fname N=132, Iceland 111, Faroe Islands 6, Germany 5, Denmark 4, Norway 3	D. in nil / Iceland

Appendix table 46: Regional summary of the appearance of the names of the Norse gods

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	6	0	6	10	7	16	15	7	23
Corded Ware Europe	6	6	12	15	15	30	21	21	42
Kurgan Europe	0	0	0	1	3	4	1	3	4
Balkans	0	0	0	1	2	3	1	2	3
Middle East	1	0	1	6	1	7	7	1	8
Central and Northern Asia	0	0	0	0	0	0	0	0	0
Gedrosia	0	0	0	5	5	8	5	5	10
India, Nepal, Sri Lanka	3	1	4	13	12	25	16	13	29
Indochina	1	1	2	3	1	4	4	2	6
Sundaland	6	0	6	15	1	16	19	1	20
China etc.	0	0	0	1	4	6	1	4	5
Japan and Koreans	0	0	0	0	1	1	0	1	1
East Africa	0	0	0	3	5	8	3	5	8
Maghreb	1	0	1	3	2	5	4	2	6
West Africa	0	0	0	2	4	6	2	4	6
Central and South Africa	5	0	5	4	0	4	9	0	9
Greece and Egypt	1	0	1	3	0	3	4	0	4

Appendix table 47: Geographical distribution of the Legendary Indus Valley names

Family	Anthroponyms	Place names and densest areas
Dionys	Dionys N=77, Belgium 44, Germany 22; fname N=1524, Germany 426, Switzerland 124;	Sanctuary of Dionysus(ruins, Greece), Dionysus(temple, Greece); D. in Belgium /Dominican Republic
	Dionis N=3830, Tanzania 2639, Spain 433, France 208, USA 186; fname N=11,108, Tanzania 2871, Dominican Republic 1248, Russia 1198, Venezuela 923, Albania 863, Colombia 501	D. in Tanzania/Albania
	Tionys n=0; Fname Brazil 1/1	D. in nil/Brazil
Heracles	Heracles N=42, Americas(many), France 3, Germany 3, Moldova 2; fname N=744, Cyprus 471, Philippines 36, DR Congo 21, Cameroon 14	D. in Peru/ Cyprus
	Heraclea Italy 1/1; fname N=579, Philippines 400, Mexico 86, Peru 33	Eraclea(Veneto, Italy), Heraclea Lucania (arch.site, Italy), Heraclea (arch.site, Policoro Italy), Heraclea Minoa (arch.site, Italy), Heraclea Lyncestis(ancient city, Greece), Heraclea (island, Greece), Marmara Heraclea(town, Ereğli, Turkey), Heraclea(town, Konya, Turkey), Heraclea Pontica(Byzantine city, Turkey), Via Heraclea(road, Spain); D. in Italy/Aruba
	Herakles N=0 ; fname N=25, Brazil 4, England 3, Chile 2, Indonesia 2, USA 2, Venezuela 2	D. in nil/Panama
	Herakle Sweden 1/1; fname Georgia 2, Albania 1, USA 1	D. in Sweden / Georgia
	Erakle N=12, India 7, England 5; fname Venezuela 1/1	D. in England /
	Heraklis N=0; fname N=40, Cyprus 25, Greece 8, Venezuela 2	D. in nil / Cyprus
	Heraklus N=0, fname N=8, Indonesia 7, South Africa 1	D. in nil / Indonesia
	Hiraklee N=0; fname India 1/1	D. in nil / India
	Irakleus Bulgaria 3/3; fname N=0	D. in Bulgaria / nil
	Pandaia N=3, Indonesia 2, India 1; fname N=2, India 1, Papua NG 1	D. in Indonesia / Papua NG
Pandaia	Pandaiya N=315, India 312, Indonesia 3; fname N=12, Papua NG 8, India 4	Pandaiya(Bihar, India), Pandaiya(locality, Uttar Pradesh, India); D. in India/ Papua NG
	Pandaiah N=417, India 413, Malaysia 4; fname India 2513/2513	D. in India/India
	Pandai N=619, India 354, Indonesia 116, Papua NG 63; fname N=276, India 168, Indonesia 76, Zimbabwe 9	Pandai(town, Wenzhou, China), Pandai(village, Indonesia), Pandai(locality, Indonesia), Pandai(locality, Western Java, Indonesia), Pandain(locality, India); D. in Papua NG/Brunei

Spatembas	Tembas N=4, Philippines 2, Cameroon 1, South Africa 1; fname N=5, Zimbabwe 3, India 2	D. in Cameroon/Zimbabwe
	Tempas N=155, Brazil 81, USA 70; fname N=5, USA 3, DR Congo 1, India 1	Tempas(locality, Indonesia); D. in Brazil/DR Congo
15 name families, 25 names (19 long, 1 short, 5 very short)		
Herakles	Kleos N=0, fname N=45, Albania 29, Brazil 11	D. in nil/Albania
Bouduas	Boudu N=206, India 190, Liberia 9, Niger 6, Nigeria 1; fname N=20, India 14, France 3, Cameroon 1, Nigeria 1, USA 1	Boudu(river, Cameroon); D. in Liberia/Cameroon
Kraduas	Kradu N=25, South Africa 23, India 2; fname N=3, India 2, Indonesia 1	D. in South Africa/Indonesia
Very short names (not included into statistics)		
Diwonuso	Diwo N=949, Germany 503, Cameroon 110, Thailand 108, Nigeria 46, France 81, Nigeria 46, Papua NG 33, Indonesia 30; fname N=122, Indonesia 44, Papua NG 31, Nigeria 15, Ivory Coast 7, Niger 5, Pakistan 4, India 3	Diwo(locality, Hechi, China), Diwo(locality, Hechi, China), Diwo(locality, Hechi, China), Diwo(locality, South Sudan), Diwo(locality, Chad); D. in Germany/Papua NG
	Nuso N=102, Thailand 75, Indonesia 16, India 5, Nigeria 3, Afghanistan 2, South Africa 1; fname N=77, India 62, Nigeria 8, Afghanistan 1	Nuso(locality, Grobogan, Indonesia), Nuso(locality, Pasuruan, Indonesia); D. in Thailand/Sweden
Herakles	Baal N=9093, India 3321, Philippines 2630, Germany 662, USA 415, Russia 288, Netherlands 239; fname N=24,729, India 23,891, Pakistan 515, Afghanistan 198	Baal(village, Belgium), Baal(village, Germany), Baal(hamlet, Netherlands), Baal(village, Pakistan), Baal(hamlet, Chad), Baal(locality, Belgium), Baal(locality, Indonesia); D. in Jersey/India
	Hera N=20,132, Bangladesh 10,634, Indonesia 1885, Romania 1270, India 1159, Ukraine 1002, Philippines 942; fname N=48,611, Bangladesh 20,070, Indonesia 15,988, India 4620, Nepal 3862, Philippines 617, Pakistan 501, USA 398	Hera(village, Greece), Herā'(locality, Iran), Hera(hamlet, East Timor), Hera(locality, Japan), Hera(area, Pakistan); D. in Cayman Islands/Iceland
Kraduas	Duas N=110, Spain 25, Brazil 16, Germany 14, Indonesia 11, Taiwan 10; fname N=95, Indonesia 40, India 26, Papua NG 13	(Combination names such as Duas Igrejas ignored); D. in Spain / Papua NG

Appendix table 48: Regional summary of the appearance of the *Legendary Indus Valley* names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	5	5	10	0	0	0	5	5	10
Corded Ware Europe	1	0	1	0	0	0	1	0	1
Kurgan Europe	0	0	0	0	0	0	0	0	0
Balkans	0	4	4	1	0	1	1	4	5
Middle East	3	3	6	0	0	0	3	3	6
Central and Northern Asia	0	0	0	0	0	0	0	0	0
Gedrosia	0	0	0	0	0	0	0	0	0
India, Nepal, Sri Lanka	8	2	10	3	0	3	11	2	13
Indochina	0	0	0	0	0	0	0	0	0
Sundaland	5	4	9	2	0	2	7	4	11
China etc.	0	1	1	0	0	0	0	1	1
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	2	0	2	0	0	0	2	0	2
Maghreb	0	0	0	0	0	0	0	0	0
West Africa	0	0	0	0	1	1	0	1	1
Central and South Africa	1	0	1	1	0	1	2	0	2
Greece and Egypt	0	4	4	0	0	0	0	4	4

Appendix table 49: Geographic distribution of the Euhemerian names

Family	Anthroponyms	Place names and densest areas
Uranus	Uranus N=72, Iran 35, Iraq 16, Indonesia 7, Liberia 5; fname N=342, Indonesia 100, Afghanistan 61, USA 34, Liberia 21, India 21, Saint Lucia 19, Philippines 14	D. in Liberia/Liberia
	Uranush N=0; fname N=2, Afghanistan 1, Russia 1	D. in Afghanistan
	Wuranus N=0; fname Indonesia 10/10	D. in nil/ Indonesia
	Uranos N=6, Russia 2, Brazil 1, Colombia 1, Egypt 1, UAE 1; fname N=10, Philippines 5, Brazil 3, DR Congo 1, Russia 1	Uranostindene(peak, Norway); D. in UAE/Philippines
	Ouranos N=184, Greece 163, USA 18; fname N=4, DR Congo 1, France 1, Greece 1, USA 1	Ouranos(hamlet, Greece); D. in Greece/Greece
	Oranos N=13, Turkey 8, Philippines 3, Chile 1, Iran 1; Oranos N=4, India 1, Sweden 1	D. in Turkey/Sweden
Panchaia, Panchea, Panachaeon	Panchaia N=0, fname India 1/1	D. in nil/India
	Panchai N=2797, Thailand 2761, Qatar 16, Malaysia 10, India 8; fname N=2613, Thailand 2374, India 228, USA 7	Panchai(locality, Bangladesh), Panchai(India), Panchai Nadi(intermittent stream, India); D. in Thailand/Thailand
	Panache N=144, Romania 55, Haiti 48, USA 14, Brazil 6, Nigeria 4, India 3; fname N=59, USA 14, India 13, England 10, Nigeria 4, South Africa 3, Zimbabwe 3	D. in Haiti/ Bhutan
	Panacha N=132, Thailand 130, England 1, Uganda 1; fname N=127, India 121, Thailand 6.	D. in Thailand/India
	Achean N=8, South Sudan 4, India 2, South Africa 1, Uganda 1; fname England 1/1	Akhean(locality, Nigeria); D. in South Sudan / England
Oceanite	Oceanite Nigeria 1/1; fname N=0	Subantarctic; D. in Nigeria /nil
	Océanie N=2, Brazil 1, Thailand 1; fname DR Congo 34, Haiti 7, USA 5, Benin 4, France 2, Indonesia, Philippines	Océanie(hamlet, France); D. in Thailand/DR Congo
	Oceanita N=0; fname Brazil 2/2	D. in nil/Brazil
	Okeanitha N=0; fname India 1/1	D. in nil/ India
Triphylius	Triphy N=0; fname N=8, India 6, USA 2	D. in nil/USA
	Trifyllis N=286, Greece 238, Cyprus 29, Germany 6, UAE 2; fname Cyprus 2/2	D. in Cyprus/Cyprus
Panara	Panara N=2403, Italy 630, India 535, Brazil 361, Indonesia 300, USA 167, Philippines 123; fname N=219, India 143, Georgia 23, Kyrgyzstan 19, USA 9, Kazakhstan 8, Philippines 6	Panara(locality, Madhya Pradesh, India), Panara(hamlet, Belarus), Panara Gopalpur(locality, India), Panara(village, Lithuania), Panara(West Bental, India), Panara(locality, Madhya Pradesh, India), Panara(locality, Uttar Pradesh, India), Karaibari Panara Suba(India), Panara(locality, Chamba, India), Panara(locality, Odisha, India), Pannara(locality, Indonesia); D. in Italy/Georgia
	Banara N=5444, India 5330, Papua NG 31, Greece 15, Pakistan 13, Nigeria 12; fname N=72, India 57, Afghan. 5, Indonesia 2, Pakistan 2	Banara(hamlet, India), Banara (Odisha, India), Banara(villate, Pakistan), Banara(village, Nepal), Banara(locality, Madhya Pradesh, India), Banara(locality, Kangra, India), Banara(West Bental, India); D. in India/Kyrgyzstan
Asterusia	Asteruis N=0; fname India 1/1	D. in nil/India
	Asterusu Nigeria 1/1; fname N=0	D. in Nigeria/nil
9 name families, 39 names (21 long, 12 short, 6 very short)		
Panachea	Achea N=49, Cameroon 18, USA 12, Nigeria 7, Kenya 4, India 1, Philippines 1, Thailand 1, Uganda 1; fname N=31, India 20, USA 7, Cameroon 1, Liberia 1, Kenya 1, Philippines 1	Port Ac'hea(bay, France); D. in Cameroon / Liberia
	Akhea India 1/1; fname N=0	
Panara	Panar N=15,119, India 14,814, USA 49, Iran 47, Brazil 43, Pakistan 43; fname N=1860, India 1659, Indonesia 113, Bulgaria 32, Kyrgyzstan 15	Panar(locality, Philippines), Indonesia , Panar(locality, Bangladesh), Panar(locality, Madhya Pradesh, India), Panar(locality, India), Panar(locality, India) Panar(area, India), Panar(locality, Gujarat, India); D. in India/Bulgaria
Doia, Doian	Doian N=60, Pakistan 53, Ukraine 2; fname N=15, USA 5, Indonesia 3, India 2	D. in Pakistan/ Israel
Hiera	Hiera N=168, Suriname 58, USA 46, Netherlands 23; fname N=67, India 47, Philippines 5, Indonesia 4, Ivory Coast 2, Japan 2, Mauritania 1	Vulcano/Hiera(island, Sicily), Marettimo /Hiera(island, Italy), Hiera(archaeological site, Turkey), Hieropolis(ancient city, Turkey), Hiera(Hamlet, Germany), Gera/Hiera/stream, Germany). Hiera(point, Finland); D. in Suriname/ Mauritania
Uranus, Worsanos	Urano N=25,987, Japan 24,365, India 937, Brazil 252, USA 165; fname N=348, Brazil 216, Italy 58, Mexico 16, Venezuela 10, USA 9	Urano(quarter, Japan), Monte Urano(village, Italy), Urano(locality, Japan); D. in Japan/Uruguay
	Uranu N=32, Indonesia 17, India 15; fname N=69; India 62, Indonesia 3, Brazil 1, Chile 1	Uranu(island, Micronesia); D. In Indonesia / Papua NG

	Worsan Yemen 1/1; fname N=2, Brazil 1, Iraq 1	D. in Yemen/Iraq
Dyaus (Zeus)	Dyaus N=0; fname N=5, USA 3, Brazil 2	D. in nil / Brazil
	Dyausa Tanzania 168/168; fname N=0	D. in Tanzania / nil
	Diyaus N=0; fname Indonesia 11/11;	Morocco; D. in nil / Indonesia
	Diyausa N=0; fname Malaysia 1/1	D. in nil / Malaysia
Very short names		
Hiera	Iera N=427, Italy 260, Canada 26; USA 23, Australia 19, Cyprus 16, Argentina 15, Brazil 14, India 11, France 10, Malaysia 8, Venezuela 6, Switzerland 5, Kiribati 4; fname N=535, India 269, Spain 143, Malaysia 48	Gera Lario/Iera(comune, Italy), Iera(hamlet, Tuscany, Italy), Manastir Lokova/Iera(locality, Greece), Iéra(valley, Chad), Iéra Moní Ayías Triádos(locality, Greece), Iéra(locality, Guinea); D. In Kiribati/Spain
Doia, Doian	Doia N=452, Brazil 307, Romania 88, Moldova 25, Ukraine 11, Papua NG 7, Pakistan 5; fname N=115, India 56, Papua NG 16, Brazil 12	Doia(locality, Ethiopia), Doia(locality, Ethiopia); Doia(Bihar, India), Doia(Jharkhand, India), Doia(intermittent stream, Ethiopia); D. in Moldova/Papua NG
Zeus (Dyaus)	Zeus N=0; fname 7906, DR Congo 2267, Philippines 1738, Mexico 1211, Spain 1025	Olympian Zeus(temple, Greece), Zeus(hamlet, Switzerland), Zeus(temple, Turkey), Zeus(altar, Turkey); France, Cyprus, Greenland, China; D. in Virgin Islands
	Tseusi N=2, Cameroon 1, DR Congo 1; fname N=0	D. in Cameroon / nil
	Tseusie Cameroon 2/2; fname Cameroon 1/1	D. in Cameroon / Cameroon
	Tseuso N=0; fname South Africa 1/1;	D. in nil / South Africa

Appendix table 50: Regional summary of the appearance of the Euhemerian names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	2	1	3	2	6	8	4	7	11
Corded Ware Europe	1	4	5	0	1	1	1	5	6
Kurgan Europe	0	0	0	0	0	0	0	0	0
Balkans	1	2	3	0	0	0	1	2	3
Middle East	2	0	2	2	2	4	4	2	6
Central and Northern Asia	0	0	0	0	0	0	0	0	0
Gedrosia	1	1	2	1	0	1	2	1	3
India, Nepal, Sri Lanka	7	18	15	5	5	11	12	23	35
Indochina	4	1	5	0	2	2	4	3	7
Sundaland	3	1	4	4	3	7	7	4	11
China etc.	0	0	0	0	0	0	0	0	0
Japan and Koreas	0	0	0	1	2	3	1	2	3
East Africa	1	0	1	1	0	1	2	0	2
Maghreb	0	0	0	0	1	1	0	1	1
West Africa	2	1	3	1	0	1	3	1	4
Central and South Africa	1	0	1	0	0	0	1	0	1
Greece and Egypt	0	2	2	0	0	0	0	2	2

Appendix table 51: Anglo-Dravidian anthroponyms

Names	Language or culture	N
Surnames and first names: Dravidian, Dravid, Travidian, Travid, Travid	Dravidian	5
First names: Dravidiansi, Dravidi, Dravidien, Dravidio, Dravidamani Dravidaselvi, Dravidan, Dravidar, Travid, Travidi	Dravidian	8
Surname: Dravidin	Dravidian	1
Surnames: Muralidhara, Thimmesh, Murthy, Patel, Reddy, Shetty	Kannada	6
Surnames: Baby, Balachandran, Eapen, Kuriakose, Lukose, Nair, Nambiar, Nambissan, Nayar, Nayyar, Ninan, Oommen, Panicker, Pillai, Rajendran, Ramachandran, Ravindran, Tharoor, Thottam, Varghese, Varkey, Varughese, Venugopal, Viswanathan	Malayam	24
Surnames: Arumugam, Ayyadurai, Balaji, Gopalakrishnan, Gopalan, Hariharan, Iyengar, Iyer, Jayaraman, Kana, Krishnan, Krishnaswamy, Maka, Nagarajan, Natarajan, Radhakrishnan, Rajagopal, Rajagopalan, Rajendran, Ramachandran, Ramakrishnan, Ramanathan, Ramanujan, Ramasamy, Ramaswamy, Saravanan, Selvaraj, Sivakumar, Sridhar, Sridharan, Venkataraman, Venkatesan, Viswanathan, Ya	Tamil	34
Surnames: Akkineni, Akula, Allu, Alluri, Angajala, Anumula, Bandaru, Bhamidipati, Bhupathiraju, Bobbili, Bolla, Bulusu, Challa, Cherukuri, Dasari, Gaddam, Kalla, Kallam, Kasu, Kodali, Kona, Konda, Kosaraju, Malladi, Mandala, Manne, Meka, Nandamuri, Pall, Perugu, Pula, Rachabattuni, Raju, Rayaprolu, Reddy, Setty, Sharma, Sridhar, Sunkara, Thota, Thumma, Tummala, Vemuri, Venkat, Venkatesh, Vennam, Vudatha, Yalamanchili, Yarlagaadda	Telugu	49

Appendix table 52: Geographical distribution of Plato's Atlantean names Gadeirus and Gadeira

	Anthroponyms	Places	India vs. Maghreb
Gadeirus	Agadir N=7726, Morocco 4669, Sudan 2520, Algeria 341, Iraq 73; fname N=1654, Iraq 932, Brazil 195, Morocco 191, Jordan 154, Yemen 53	Morocco (7), Mauritania (2), Algeria; D. in Morocco & Sudan / Iraq & Jordan	Maghreb
	Gadeir Switzerland 6/6, fname N=3, USA 2, Netherlands 1	D. in Switzerland/Netherlands	
	Ghadeir Iran 1/1; fname N=19, Qatar 8, Egypt 4, Thailand 4, UAE 2	D. in Iran / Qatar	Gedrosia
	Gadeira N=0; forename N=0	Spain; D. in nil/nil	
	Gadeira N=2, Brazil 1, USA 1; fname N=6, USA 4, Italy 1, Niger 1	D. in Brazil/Niger & Italy	
	Gadera N=102, India 51, Poland 30, Indonesia 14, Brazil 2, Zimbabwe 2, Algeria 1, Niger 1, Philippines 1; forename N=26, India 24	D. in Poland & Zimbabwe / Papua NG & Ivory Coast	India
	Gadeiraya India 1/1; fname N=0	D. in nil/India	India
	Gadeiray India 19/19; forename India 7/7	D. in India/India	India
	Gadeire Niger 1/1; fname Niger 1/1	D. in Niger/Niger	
	Gadera N=102, India 51, Poland 30, Indonesia 14, Brazil 2, Zimbabwe 2, Algeria 1, Niger 1, Philippines 1; forename N=26, India 24	D. in Poland & Zimbabwe / Papua NG & Ivory Coast	India
	Gadira N=51, Papua NG 29, Indonesia 14, India 5; fname N=36, India 13, USA 9, Indonesia 6, Georgia 2	D. in Papua NG/Georgia	India
	Gadiri N=1014, Morocco 477, Algeria 417, Iran 21, Ireland 41, Canada 11, Uganda 10, Russia 10; fname N=231, Guinea 173, India 34, Cameroon 5	Kurgan Russia, D. in Morocco/Guinea	Maghreb
	Gadara N=577, India 180, Egypt 153, Argentina 60, Nigeria 56; forename N=174, India 124, Nigeria 32, Afghanistan 5	Jordan (2), Pakistan, India (2), Chad, Mauritania; D. in Bosnia Herzeg & Qatar / Liberia & Nigeria	India
	Kadeir N=4, India 1, Malaysia 1, Mauritania 1, Venezuela 1; fname N=6, India 2, Burkina Faso 1, England 1, Guyana 1, Malaysia 1	D. in Mauritania/Guyana	India
	Kadeira N=2, Brazil 1, USA 1; fname N=6, USA 4, Italy 1, Niger 1	D. in Brazil/Niger	
	Kadeiri N=4, India 3, Iran 1; fname Niger 12/12	D. in Iran/Niger	India
	Kadira N=2646, Zimbabwe 637, India 526, Togo 526, Morocco 307, Egypt 183; fname N=7609, Bosnia and Herzegovina 2449, India 1932, Djibouti 1696	Nigeria (3), Niger, Turkey, Chad; D. in Togo & Zimbabwe / Djibouti & Bosnia and Herzegovina	
	Kadeiro N=0; fname USA 3/3	D. nil/USA	
	1 name family, 23 names (18 long, short 5, 0 very short) ; Gdr was classified as a 5 letter name, as it is assumed to contain 2 extra vocals		
Gadeirus	Gadir N=18,626, Sudan 13,720, Israel 3278, Saudi Arabia 477, Chad 385, Maldives 179, Morocco 170; fname N=2726, Israel 1643, Russia 230	Spain, Sicily, Morocco, Pakistan (2); D. in Maldives, Israel & Sudan / Israel & Georgia	
	Gader N=6865, Sudan 5040, Philipp. 493, Algeria 278, Saudi Arabia 278, India 219; fname N=575, Saudi Arabia 408, Iraq 24, Qatar 20, India 19	Jordan, Kenya (2), Italy, India (2), Pakistan; D. in Sudan / Saudi Arabia & Qatar	India
	Gadei N=291, India 164, Romania 77, Papua NG 42, Cameroon 2, Moldova 2; fname N=327, India 295, Papua NG 14	Mauritania, Central African Republic; D. in Papua NG/Papua NG	India
	Gdr N=16, Dmark 5, Thailand 5, Tunisia 4; fname N=54, Dmark 31, India 5	India, Siberia; D. in Tunisia & Denmark / Denmark	India

Kadir N=227,305; Indonesia 57,641, India 51,104, Bangladesh 48,104; fname N=335,176; Turkey 214,402, India 51,228, Indonesia 30,676, Ethiopia 7629	Corded Ware Russia (3) , Bulgaria , Turkey , India (2) , Papua NG ; D. in Brunei / Malaysia, Indonesia, Bulgaria	India
Kadei N=239; Nigeria 77, Iran 62, Niger 46, India 20, Papua NG 11, Cameroon 10; fname N=150; India 76, 25, DR Congo 21, Indonesia 14, Niger 10	Cameroon (3) , South Sudan ; D. in Niger/Niger	India
No appearance: Gadeirus, Gadeiros; Highest appearance: India 14 names, Maghreb 2 names		

Appendix table 53: Regional summary of the appearance of Plato's Atlantean names Gadeirus and Gadeira

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	2	1	2	0	3	3	2	4	6
Corded Ware Europe	0	0	0	2	3	5	2	3	5
Kurgan Europe	0	0	0	0	1	1	0	1	1
Balkans	1	0	1	0	1	1	1	1	2
Middle East	1	4	5	3	1	4	4	5	9
Central and Northern Asia	0	0	0	0	1	1	1	0	1
Gedrosia	1	1	2	0	3	3	1	4	5
India, Nepal, Sri Lanka	12	2	14	0	5	5	12	7	19
Indochina	0	0	0	0	0	0	0	0	0
Sundaland	1	0	1	1	1	2	2	1	3
China etc.	0	0	0	0	0	0	0	0	0
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	0	0	0	2	3	5	2	3	5
Maghreb	2	21	13	0	2	2	2	13	15
West Africa	4	5	9	1	3	4	5	8	13
Central and South Africa	1	0	1	0	1	1	1	1	2
Greece and Egypt	0	0	0	0	0	0	0	0	0

Appendix table 54: Geographical distribution of Potentially Atlantean names

	Anthroponyms	Places
Ampheres	Ampheres N=0; forename China 1/1	D. in nil/China
	Amphere USA 3/3; forename N=0	D. in USA/nil
	Amferes Indonesia 8/8; fname N=0	D. in Indonesia / nil
	Amfere N=0; fname DR Congo 1/1	D. in nil/DR Congo
	Ampher South Africa 1/1; fname N=4, Philippines 2, Greece 1, Mexico 1	D. in South Africa / Greece & Philippines
	Ampere N=1081, Chad 674, Ghana 277, France 63, Uganda 26, Philippines 18, India 5; forename N=130, DR Congo 55, Cameroon 16, Brazil 13, Philippines 12	Ain Azal/Ampère (town, Algeria), Ampère (locality, Indonesia); D. in Chad & Ghana / Macau, DR Congo & Cameroon
	Ampeire N=4747, Uganda 4742, USA 2; fname N=12, Uganda 10, UAE 2	D. in Uganda / UAE & Uganda
	Atlantis N=22, Cyprus 16, England 3, Brazil 1, Canada 1, Israel 1; fname N=173, USA 67, South Africa 13, UAE 12, India 7, Israel 7, Russia 5, Spain 4, Colombia 4, Morocco 4	Atlantis(town, South Africa), Atlantis (ancient island, "on the other side of Africa, at the same meridian as Carthage", Equatorial Guinea); D. in Cyprus & Israel / Bahamas & UAE
Atlantis Atlantean	Atlantis Spain 1/1; fname N=0	D. in Spain / nil
	Atlantic N=0; fname N=282, Morocco 164, India 30, Canada 15, England 11, UAE 6, Qatar 5, Portugal 4, Spain 4	
	Atlantik N=29, Indonesia 14, Russia 10, Turkey 3, Greece 1, Kazakhstan 1; fname N=43, Indonesia 7, Turkey 4, Russia 3	D. in Indonesia/Kosovo
	Atlantisa N=0; fname Bulgaria 1/1	D. in nil/ Bulgaria
	Atlantia N=0; fname N=5, USA 4, South Africa 1;	D. in nil/South Africa
	Atlanti N=46, Italy 43, Russia 2, Belgium 1; fname N=17, Indonesia 16, India 1	Atlanti (village, Turkey), Atlanti (village, Turkey); D. in Italy & Belgium / Indonesia
	Atlantean N=0; USA 1/1	D. in USA/USA
	Atlante N=257, Italy 119, Argentina 109, France 13; fname N=33, Brazil 12, USA 7, Italy 6	D. in Argentina & Italy / Italy & Chile
	Atlantes N=0, fname N=4, India 2, USA 2	D. in nil/USA
	Atlant India 1/1; fname N=109, Russia 40, Albania 25, Kazakhstan 11, USA 9, Kyrgyzstan 4	D. in nil/ Albania
	Atlani N=925, France 771, Israel 67, India 65, USA 6; forename N=17, Indonesia 14, India 1, Mexico 1, USA 1	D. in France & Israel / Indonesia & Mexico
	Atlantida N=68, Russia 50, Brazil 4, Spain 4, Venezuela 2; fname N=235, Mexico 70, Dom.Rep. 37, Argentina 26, Chile 19, Russia 17, USA 15, Kosovo 9, Brazil 6, Nicaragua 6, Belarus 4.	D. in Russia/Kosovo
	Atlantide N=0, USA 2, Chile 1, Italy 1, Kosovo 1	D. in Kosovo
	Atlantides France 1/1	D. in nil/France
Evaemon	Evamon N=0; fname N=19, India 15, USA 3, Philippines 1	D. in nil/India
	Evamoni Bangladesh 1/1; fname N=12, India 10, Bangladesh 1, Malaysia 1	D. in Malaysia
	Evaema India 7/7; forename N=12, Brazil 10, Papua NG 1, Tanzania 1	D. in India/ Papua NG
	Evamona N=0; fname N=2, Philippines 1, Sweden 1	D. in Sweden
	Euaimayan India 3/3; N=0	D. in India/nil

Evenor	Evenor N=390, Mauritius 193, 85, 82, USA 11, Israel 7, England 6; fname N=1693, Nicaragua 1236, Honduras 186, USA 69, Costa Rica 41, France 38	D. in Seychelles/Nicaragua
	Evenus N=5, Nigeria 4, Namibia 1; fname N=56, Indonesia 19, Tanzania 13, USA 9, Nigeria 6, Brazil 4	D. in Namibia/Tanzania
	Evenora N=0; fname N=11, Mexico 5, Tanzania 4, Guatemala 2	D. in nil/Guatemala & Tanzania
	Evenorah N=0; fname Mexico 1/1	D. in nil/Mexico
	Evenore N=0; fname Papua NG 1/1	D. in nil/ Papua NG
	Evenuse N=0; fname Brazil 1/1	D. in nil/Brazil
	Evenusse N=0; fname Ivory Coast 1/1	D. in nil/ Ivory Coast
Mestor	Mestor N=47, Germany 13, Algeria 8, India 7, USA 6, Morocco 4, Burkina Faso 2; forename N=91, DR Congo 21, USA 19, India 16, Indonesia 8, Philippines 5	D. in Algeria & Germany / DR Congo & Taiwan
	Mestouri N=613, Algeria 441, Morocco 170, Tunisia 1; fname Algeria 1/1	D. in Algeria & Morocco / Algeria
	Mestoris N=0; forename India 5/5	D. in nil/India
	Mestoura N=311, Algeria 300, England 2, France 2, Mauritania 2; forename N=354, Algeria 203, Mauritania 138, France 7, Benin 5.	D. in Algeria/Mauritania & Algeria
	Mestour N=5661, Algeria 3035, Morocco 2454, Spain 88; forename N= Algeria 635, Morocco 9, Mauritania 2	D. in Algeria & Morocco / Algeria
	Mneseus N=0; forename N=18, India 12, Pakistan 5, USA 1	D. in nil / Pakistan & India
	Mneshe N=0; forename South Africa 1/1	D. in nil/ South Africa
9 name families, 77 names (43 long, 30 short, 4 very short)		
Ampheres	Amphe N=0; forename N=11, South Africa 4, Philippines 3, Nepal 2, Ireland 1, Cambodia 1	Amphe (locality, Nepal); D. in nil / Ireland, South Africa, Nepal
	Amper N=11,468, Philippines 10,644, Saudi Arabia 278, USA 265, Finland 44, Russia 31; forename N=136, Philippines 35, Russia 7	Amper (village, Nigeria), Amper (locality, Philippines), Amper (village, Germany); D. in Philipp./ Cyprus & Philipp.
Atlantis	Atlan N=5158, France 2802, Turkey 1378, Israel 696, USA 68; forename N=623, Turkey 266, 143, Indonesia 62, Iran 29, USA 24, India 17, Brazil 15, Pakistan 7	D. in Monaco & Israel/Marshall Islands & Turkey
Atlas	Atlas N=12,950, Morocco 3681, Turkey 1938, Afghanistan 538, Egypt 488, Pakistan 480, Saudi Arabia 477, Israel 419, Philippines 289, Iran 272; fname N=13,865, Pakistan 6490, Azerbaijan 2397, Afghanistan 1466, Morocco 573, Turkey 427, Saudi Arabia 233, Russia 216, Zimbabwe 155	Atlas (mountains, Morocco), Atlas (town, Morocco), Atlasovo (village, Russia), Atlas (mountains, Algeria), Atlashevo (village, Corded Ware Russia), Atlas (village, Turkey), Atlas (village, Turkey), Atlas (suburb, Libya), Atlas (suburb, England), Atlas (peak, Germany); D. in Monaco & Morocco/Azerb, Afghan. & Pakistan
	Atalas N=99, Pakistan 63, Iran 30, India 3, England 1, Germany 1, Italy 1; fname N=2476, Pakistan 1305, Iran 1119, India 30, Brazil 17, DR Congo 4, Turkey 1	D. in Iran/Iran
	Atlash Pakistan 2/2; fname N=184, Pakistan 159, India 24, Russia 1	D. in Pakistan/Pakistan
	Atlasi N=43, England 14, Greece 8, Afghanistan 5, USA 5; fname India 6/6.	D. in Greece, England & Afghanistan / Georgia
	Atlassi N=2494, Morocco 2386, Sweden 20, Spain 17; fname N=5, Morocco 4	D. in Morocco & Monaco / Morocco
	Atlaz N=39, Greece 24, Turkey 14; fname N=1044, Azerbaijan 997, Armenia 16, Georgia 13	D. in Greece / Azerbaijan
	Atlasov N=1858, Russia 1723, Uzbekistan 44, Kyrgyzstan 28; fname Russia 1/1	Atlasov (island, Russia), Atlasov (village, Russia); D. in Russia & Uzbek. / nil
Azaes	Azaes N=2, Iran 1, Philippines 1; forename Mexico 3/3	D. Iran & Philippines / Mexico
	Azaez N=8, Pakistan 8/8; forename Tunisia 1/1	D. in Pakistan / Tunisia
	Asaes N=0; forename 315, India 314, USA 1	D. in nil / India
	Asaez Philippines 1/1; forename USA 1/1	D. in Philippines / USA
Gades	Gades N=968, India 297, USA 277, Philippines 146, Germany 81, Brazil 79, Iran 43; fname N=128, India 61, Indonesia 42, Philippines 5, Paraguay 4	Gades/Cadiz (city, Spain), Gades (hamlet, India); D. in Philippines & Germany / Paraguay & Benin
	Agades N=11, Niger 8, Israel 3; fname N=539, Chad 433, India 31, Nigeria 30	Agadez (city, Niger); D. in Niger & Israel / Chad
	Agadi N=7812, India 5141, Uganda 1189, Nigeria 874, Algeria 174; fname N=1649, India 1429, Nigeria 90, DR Congo 55, Uganda 23, Niger 17	Agadi(city, Sudan), Agadir (city, Morocco), Agadi (village, Niger), Agadi (village, Uganda), Agadi (village, India), Agadi (village, India), Agadi (hamlet, Chad), Agadi (locality, Nepal), À Gadi (locality, Belgium); D. in Uganda / India
	Gadesiy India 592/592; forename India 58/58	D. in India / India
	Gadesula N=224, India 223, USA 1; fname India 12/12	D. in India / India
	Gadesh N=11, Yemen 4, India 2, Israel 2, South Africa 2, Lebanon 1; forename N=427, India 423, Azerbaijan 1, Pakistan 1, Russia 1, USA 1	D. in Israel & Lebanon / India & Azerbaijan
	Gadeses N=354, Ghana 346, India 7; fname England 1, Ghana 1, South Africa 1	D. in Ghana / Ghana & South Africa
	Gadesa N=2, Ethiopia 1, Mexico 1; fname N=3011, Ethiopia 3005, India 5	D. in Ethiopia / Ethiopia
	Gadesi N=19, India 12, USA 6, Solomon Islands 1; forename N=36, India 22, Indonesia 11, Nigeria 1, South Africa 1, Zimbabwe 1	D. in Solomon Islands / Zimbabwe & India
	Kades N=1003, Brazil 489, Egypt 183, USA 129, Kazakhstan 52, Germany 41, Indonesia 27, Belgium 17, India 17; fname N=219, Indonesia 112	Kades (village, Cameroon), Kades (locality, Nepal); D. in Kazakhstan, Brazil / Solomon Islands & Albania
	Kadesh N=2960, Yemen 2682, USA 80 74; fname N=210, India 70, USA 45	Kadesh (ancient city, Syria); D. in Yemen / Solom. Islands & Trin. and Tobago
	Kedesh N=51, Ukraine 50, USA 1; fname N=54, India 14, Solomon Islands 11	Kedesh (archaeological site, Israel); D. in Ukraine / Solomon Islands & Saint Lucia
	Qedesh Tanzania 85/85; forename N=0	D. in Tanzania / nil
	Quades N=10, USA 8, Brazil 1, India 1; forename N=0	D. in USA / nil
	Qadesh N=2, Afghanistan 1, Thailand 1; fname N=3, Afghanistan 1, Azerbaijan 1, Mexico 1	D. in Afghanistan & Thailand / Azerbaijan & Afghanistan
Mneseus	Mnese N=62, Tanzania 60, Cameroon 1; fname N=8, Tanzania 6, S.Africa 2	D. in Tanzania / South Africa
Very short names		
Atlas	Atla N=11,489, India 10,264, Thailand 354, Turkey 204, Egypt 183; fname N=1742, India 1055, Afghanistan 388, Pakistan 58, Tanzania 57, Indonesia 53	Atla (hamlet, Estonia), Atla (hamlet, Estonia), Atla (stream, Estonia), Ätla (locality, India); D. in Liechtenstein & India

Azaes	Azae N=75, Iraq 26, Iran 20, Papua NG 20, Nigeria 6, India 1, Pakistan 1, USA 1; fname N=19, Indonesia 5, Papua NG 5, Russia 2, Iran 1, Kazakhstan 1, Nigeria, 1, South Africa 1, USA 1	D. in Papua NG /Papua NG
Gades	Gade N=113,824, India 98,458, Denmark 3087, Indonesia 2194, USA 1927, Germany 1636; fname N=8057, India 4718, Indonesia 1082, Senegal 928, Niger 266	Gadê (city, China), Gadeland (suburb, Germany), Kequ/Gade (locality, China), Gade (farm village, China), Gandai/Gadé (farm village, China), Gåde (hamlet, Sweden), Gâdi (locality, Sweden), Indonesia(3), Gade (village, Senegal , 2); D. in Denmark , Fiji & India / Senegal & Niger
Mneseus	Mnes Saudi Arabia 1/1; fname N=3, Tanzania 2, India 1	D. in Saudi Arabia / Tanzania
N=0: Atlantian, Evaemon, Mneseus		

Appendix table 55: Regional summary of the appearance of the Potentially Atlantean names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	8	0	8	2	5	7	10	5	15
Corded Ware Europe	3	0	3	2	1	3	5	1	6
Kurgan Europe	1	0	1	1	0	1	2	0	2
Balkans	1	0	1	1	0	1	2	0	2
Middle East	1	2	3	5	4	9	6	6	12
Central and Northern Asia	0	0	0	0	3	3	0	3	3
Gedrosia	0	0	0	9	0	9	9	0	9
India, Nepal, Sri Lanka	8	0	8	15	6	23	23	6	29
Indochina	1	0	1	0	0	0	1	0	1
Sundaland	11	1	12	2	1	3	13	2	15
China etc.	1	0	1	0	0	0	1	0	1
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	4	0	4	5	2	7	9	2	11
Maghreb	7	1	8	4	4	8	11	5	16
West Africa	2	0	2	2	4	6	4	4	8
Central and South Africa	7	1	8	1	0	1	8	1	9
Greece and Egypt	0	0	0	2	0	2	2	0	2

Appendix table 56: Regional summary of the appearance of the Atlantean and Potentially Atlantean names

Region	Atlantean names (Gadeir name family)			Potentially Atlantean			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	2	4	6	10	5	15	12	9	21
Corded Ware Europe	2	3	5	5	1	6	7	4	11
Kurgan Europe	0	1	1	2	0	2	2	1	3
Balkans	1	1	2	2	0	2	3	1	4
Middle East	4	5	9	6	6	12	10	11	21
Central and Northern Asia	1	0	1	0	3	3	1	3	4
Gedrosia	1	4	5	9	0	9	10	4	14
Ext. India	12	7	19	23	6	29	35	13	48
Indochina	0	0	0	1	0	1	1	0	1
Sundaland	2	1	3	13	2	15	15	3	18
China etc.	0	0	0	1	0	1	1	0	1
Japan and Koreas	0	0	0	0	0	0	0	0	0
East Africa	2	3	5	9	2	11	11	5	16
Maghreb	2	13	15	11	5	16	13	18	31
West Africa	5	8	13	4	4	8	9	12	21
Central and South Africa	1	1	2	8	1	9	9	2	11
Greece and Egypt	0	0	0	2	3	5	2	3	5

Kalevalan names

In the Finnish language it is typical to create an extended version of a name by adding the ending “nen”. In order to add this ending, the word may need to be modified and in these modifications “ng” may change to “k”, for example, the shorter root for Lemminkäinen may well be Lemming. Some of the names are additional names, which describe the owner of the name. Examples of these are Saarelainen (“From the Island”), Vanha (“Old”) and “Kaukomieli” (“The one who yearns to travel

far”). The first name of Väinämöinen is *Vaka*, and it is not certain whether it is a name or whether it refers to adjective *vakaa*, which means “Steady” and “Stable”.

Appendix table 57: Geographical distribution of Kalevalan names

Name	Anthroponyms	Places and densities
Annikki	Annikki N=2, Finland 1, USA 1; fname N=7327, Finland 6859, Sweden 201, Estonia 46, Germany 46	Annikki(islet, Finland), Annikki(lake, Finland); D. In Finland / Finland & Cayman Islands
	Annikki N=7, India 5, Algeria 1, Papua NG 1; fname N=187, Estonia 187, South Africa 65, Sweden 22, Papua NG 7, Finland 5	D. in Papua NG/Estonia
Antero	Antero N=3677, Brazil 1349, Philippines 1009, Portugal 311, Colombia 256, Mexico 207, Italy 103, Spain 101; fname N=36,701, Peru 7481, Brazil 6693, Finland 6103, Philippines 4733	D. in Portugal & Philippines / Finland & Portugal
	Andero N=772, Nigeria 507, Nicaragua 129, Spain 94; fname N=218, Estonia 171, USA 11, Nigeria 11, Finland 5	Andero/Andiro(locality, Afghanistan); D. in Honduras / Estonia
Ilmarinen	Ilmarinen N=322, Finland 297, Estonia 12, Sweden 10, Russia 2, Romania 1; fname Mexico 2, Russia 2, USA 2, Finland 1	Ilmarinen(town, Turku, Finland), Ilmarinen(locality, Loimaa, Finland); D. in Finland & Estonia/ Finland & Russia
	Ilmari N=54, Finland 43, USA 4, England 3, Sao Tome and Principe 2, Pakistan 1, Russia 1; fname N=2151, Finland 1969, Indonesia 35, Sweden 33, Estonia 29, Russia 20	D. in Sao Tome and Principe & Finland/Finland & Estonia
Ilmatar	Ilmatar N=0; fname Netherlands 1/1	D. in Netherlands
	Ilmadar N=0; India 7/7	D. in nil/India
	Ilmatara N=0; fname India 1/1	D. in nil/India
Joukahainen	Joukahainen, Finland 5/5; fname N=0,	Jouka (locality, Belgium); D. in Finland/Finland
Kaleva	Kaleva N=2046, Bulgaria 963, Finland 564, Ukraine 133, Russia 104, USA 96, North Macedonia 54, Estonia 27, Papua NG 22, Sweden 12, India 12; fname Kaleva N=226, India 139, Finland 61, USA 10, Papua NG 8, Russia 3	Kaleva (locality, Estonia), Kaleva(locality, Polynesia); D. in Bulgaria/Bulgaria & Finland
	Caleva Moldova 77/77; fname N=4, Canada 1, DR Congo 1, India 1, North Macedonia 1	Caleva (locality, Mozambique), Caleva (area, Angola); D. in Moldova / North Macedonia
	Kalewa N=1148, Kenya 568, Malawi 209, DR Congo 171; fname N=440, Kenya 320, DR Congo 48, South Africa 26	Kalewa(town, Myanmar), Kalewa(locality, Myanmar), Kalewa(village, India), Kalewa(locality, Kenya),
	Calewa Philippines 2/2; fname N=0	Calewa/Calw(locality, Germany); D. In Philippines/nil
Kalevala	Kalevala India 2/2; fname N=3, Russia 2, India 1	Kalevala(urban locality, Russia), Finland ; D. in India/Russia
Kalervo	Kalervo N=145, Finland 82, Brazil 26, Dominican Republic 23, USA 10, Mexico 1, Russia 1, Sweden 1, Ukraine 1; fname N=2910, Finland 2765, Sweden 90, Estonia 17, Germany 6	D. in Finland/Finland&Estonia
	Calervo Sweden 1/1; fname N=0	D. in Sweden/nil
Kullervo	Kullervo N=6, Brazil 4, Finland 1, Germany 1; fname N=365, Finland 335, Sweden 19	D. in Finland & Brazil / Finland & Sweden
Kyllikki	Kyllikki N=7, Brazil 5, Finland 2; fname N=4415, Finland 4282, Sweden 75, Estonia 23	D. in Finland / Finland & Estonia
	Kyllikkie N=0; forename Namibia 1/1	D. in nil/ Namibia
	Cyllik N=13, Germany 11, Poland 2; fname N=0	D. in Germany/nil
Marjatta	Marjatta N=16, Brazil 10, Finland 3, Canada 1, Kenya 1, Namibia 1; fname N=15,162, Finland 14,563, Sweden 273, Germany 113, USA 86, Canada 62	D. in Finland & Namibia / Finland
	Marjata N=0; fname N=20, Indonesia 15, Albania 3, India 1, Sweden 1	D. in nil/Albania
Lemminkäinen	Lemminkäinen N=28, Finland 27, Sweden 1; fname N=3, Denmark 1, Finland 1, Sweden 1	D. in Finland/Finland & Denmark
	Lemming N=1495, Denmark 625, USA 556, England 80, Sweden 62, Australia 46, Estonia 42, Germany 39, Norway 13, Canada 8, Finland 7; fname N=15, Russia 4, India 3, Indonesia 3, China 1, Estonia 1, Scotland 1, USA 1, Venezuela 1	Lemming(village, Denmark), Lemming (hamlet, Denmark), Lemmingvaer (island, Norway); D. In Denmark & Scotland
Sampsä	Sampsä N=3, USA 2, Finland 1; forename N=972, Finland 932, Estonia 17, England 5	D. in Finland/Finland&Estonia
	Sampsan N=27, Nigeria 19, India 4; fname N=4, Nigeria 2, India 1, Liberia 1	D. in Nigeria & Benin / Liberia
	Shampsan N=0; fname India 1/1	D. in nil/India
Tellervo	Sampsä Philippines 1/1; fname Senegal 1/1	D. in Philippines/Senegal
	Tellervo N=17, Brazil 7, Denmark 6, Finland 2, USA 2; fname N=2408, Finland 2335, Sweden 38	D. in Denmark & Finland/Finland
Untamo	Tellerva Philippines 116/116; fname USA 1/1	D. in Philippines/USA
	Untamo N=38, Finland 27, USA 7; fname N=72, Finland 71, USA 1	D. in Finland/Finland
Vellamo	Vellamo N=87, Finland 81, Russia 5, India 1; fname N=62, Finland 56, Sweden 2, USA 2, Norway 1, Russia 1	Vellamo (island, Finland); D. in Finland / Finland & Sweden
	Vellam N=171, England 94, India 37, USA 15, Canada 11, Jersey 7, Ireland 1; fname N=29, India 21, Qatar 5, Botswana 1, Italy 1, South Africa 1	D. in Jersey & England/Qatar & Botswana
Virokannas	Virokannas N=61, Finland 60, USA 1; fname N=0	D. in Finland/nil
Väinämöinen	Väinämö N=191, Finland 184, Sweden 7; fname Finland 2/2	D. in Finland/Finland
	Vainamo N=7, Brazil 3, Finland 1, Sweden 1, England 1, Germany 1; fname India 1/1	Vainamo (bay, Polynesia); D. In Finland & Sweden / India
Vipunen	Vipunen N=0; fname India 5/5	D. in nil/India
27 name families, 59 names (39 long, 15 short, 5 very short)		

Kauko	Kauko N=463, Finland 278, Papua NG 70, Israel 45, Sweden 36; fname N=11,270, Finland 10,560, Sweden 439, Estonia 74	Kauko (hamlet, Finland), Kauko (locality, Finland), Kaukosaari (island, Finland), Kauko (fountain, Lithuania, not included); D. in Papua NG & / Finland
	Cauco N=124, Bolivia 74, France 38, USA 6, Italy 3; fname N=16, Bolivia 9, Ivory Coast 6, USA 1	Cauco (former municipality, Switzerland), Cauco(intermittent stream, Angola); D. in Bolivia/Bolivia
Joukahainen	Jouka N=227, Iraq 136, Mauritania 71, Niger 13; fname N=56, Finland 15, Niger 14, Germany 10, UAE 6, Iraq 4	Jouka (locality, Belgium), Joukaisjärvi (lake, Finland); D. in Mauritania / Finland & UAE
	Jouga N=164, Morocco 136, Senegal 12, France 9; fname Cameroon 1/1	Jouga (hamlet, Estonia); D. in Morocco /Cameroon
Louhi	Louhi N=720, Finland 274, Morocco 239, Algeria 161, USA 24, Sweden 5, Thailand 5, France 4, Ivory Coast 3; fname N=18, India 10, Finland 3, USA 1, Algeria 1, Pakistan 1, Papua NG 1	Louhi/(village, Russia), Louhi(hamlet, Finland); D. in Finland & Morocco / Finland & Papua NG
Kyllikki	Kylli N=355, Finland 222, Sweden 51, Thailand 40, Greece 23; fname N=198, Finland 84, Estonia 80, India 16, USA 5	D. in Finland & Sweden / Estonia & Finland
Kaleva	Kalev N=1933, Bulgaria 894, Estonia 303, Israel 182, Russia 173, Ukraine 129, USA 81, North Macedonia 29, Turkey 29, Canada 25, India 12; fname N=3090, Estonia 2568, Indonesia 153, Finland 99, USA 84, Canada 33, Sweden 22, India 21	D. in Estonia & Bulgaria / Estonia & Finland
Tapio	Tapio N=3533, Finland 1739, USA 451, Philippines 451, Papua NG 235, Australia 199; fname N=18,157, Finland 17,019, Sweden 421, Estonia 228, Papua NG 126	Tápiószecső (prehistoric settlement, Hungary), Tápiószele (village, Hungary), Tápiószentmárton (village, Hungary), Tápióbicske (village, Hungary), Tápióság (village, Hungary), Tapionkylä (village, Finland), Tapio (village, Papua NG), Tapio(suburb, Finland), Tapio (village, Finland); D. in Finland & Papua NG / Finland & Estonia
Tiera	Tiera N=1040, Chad 385, India 267, Burkina Faso 262, Brazil 48, Indonesia 36; fname N=2242, USA 1773, India 347, Burkina Faso 25, Canada 22, Ivory Coast 17, Indonesia 16, England 9	Tiéra/Tiaré (locality, Burkina Faso), Tiera (locality, Veneto, Italy), Tiera (locality, Potenza, Italy), Tiera (stream, Italy), Tiera (strea, Ghana); D. in Chad & Burkina Faso / Grenada, Burkina Faso & Finland
Tuira	Tuira N=261, French Polynesia 153, Finland 40, Australia 15, Canada 12, Brazil 9, Fiji 9, India 8; fname N=133, Brazil 91, India 15, Germany 9	Tuira(suburb, Finland), Tuira (islet, Finland), Tuira/Tuila (islet, Micronesia); D. in French Polynesia & Fiji / Panama & Fiji
Niera	Niera N=253, Philippines 153, USA 40, India 16, Peru 16, Argentina 10; fname N=1121, Egypt 629, India 297, Philippines 91, Indonesia 55	Nyer/Niera (France), Niera (peak, France), Neira/Niera(peninsula, Indonesia); D. in Philippines / Egypt
Tuuri	Tuuri N=1022, Finland 621, USA 194, India 76, Sweden 42, Canada 35, Papua NG 31, Estonia 15, Israel 4; fname N=27, Papua New Guinea 7, India 6, Finland 4, Kiribati 4, Nepal 2	Tuuri(town, Finland), Tuu-ri (locality, South Korea); D. in Finland / Kiribati & Finland
Väinämöinen	Väinä Finland 43/43; fname N=0	D. in Finland/nil
	Vaina N=2113, India 1090, Greece 250, Papua NG 121, Romania 112, Italy 108, Russia 98, Australia 67, USA 61, Lithuania 36; fname N=3138, Zimbabwe 1374, India 842, Brazil 346, Zambia 168, Papua NG 119, South Africa 65, Malaysia 38, French Polynesia 32, USA 17, Nepal 14	Venla I/Vaina(hamlet, Liberia), Vaina(locality, Spain), Vaina(locality, Liberia), Vaina(locality, Uttar Pradesh, India), Väina(peak, Greece), Vainatrakis(archaeological site, Lithuania); D. In Papua NG/French Polynesia
Very short names		
Ahti	Ahti N=658, Finland 531, Indonesia 43, USA 24, France 17, Singapore 13, Estonia 8, Canada 4, Sweden 4, Russia 2, Malaysia 2; fname 5811, Finland 4464, Estonia 982, Sweden 161	Ahti(Kurgan Russia); D. in Finland & Estonia/ Finland & Estonia
	Ahtisham N=489, Pakistan 424, India 37, Qatar 9; fname N=2694, Pakistan 1693, Saudi Arabia 641, India 162, UAE 72, Kuwait 38, England 29	
Aino	Aino N=3403, Japan 1385, Uganda 582, Papua NG 493, Nigeria 344; fname N=29,282, Finland 17,561, Nigeria 4036, Estonia 1778, Sweden 1467, Namibia 1043, Japan 735, Afghanistan 667, USA 312, India 288	Japan (4), Switzerland, Pakistan, Kenya; D. in Papua NG & Uganda / Finland, Estonia & Namibia
Annikki	Anni 17,837, Bangladesh 10,634, Philippines 1598, India 730, Ghana 693, Indonesia 660, Morocco 613, Nigeria 524, Chad 385, Papua NG 233, Italy 222; fname N=188,703, Germany 109,8835, India 11,359, Indonesia 10,385, Finland 10,385, Denmark 9423, Bangladesh 8798	South Korea , Iran, South Korea , Estonia, India; D. in Marshall Islands & Bangladesh / Finland & Denmark
Vaka	Vaka N=18,919, India 16,031, Ivory Coast 342, USA 317, DR Congo 294, Tonga 280, Fiji 189, Albania 185; fname N=2622, India 2160, Russia 120, Ivory Coast 118, 32, Papua NG 28, Nepal 22	Solomon Islands, Japan, Norway, Romania(2), Lithuania(2), Georgia(2), Afghanistan(2), Republic of Congo, India; D. in Tonga & Solomon Islands / Iceland & Ivory Coast
Ukko	Ukko N=35, Finland 23, Russia 5, Philippines 2; fname N=164, Finland 141, India 9	Finland; D. in Finland / Finland

Appendix table 58: Regional summary of the appearance of Kalevalan names

Region	Long names			5 letter names			Total		
	Modes	Places	Total	Modes	Places	Total	Modes	Places	Total
Bell Beaker Europe	2	2	3	1	7	8	3	9	12
Corded Ware Europe	34	11	35	10	11	18	44	22	66
Kurgan Europe	1	0	1	0	5	5	1	5	6
Balkans	1	0	1	1	1	2	2	1	3
Middle East	0	0	0	2	0	2	2	0	2
Central and Northern Asia	0	0	0	0	0	0	0	0	0
Gedrosia	0	1	1	0	0	0	0	1	1
India, Nepal, Sri Lanka	9	0	8	6	1	7	15	1	16
Indochina	2	3	5	0	0	0	2	3	5
Sundaland	5	2	7	3	3	6	8	5	13
China etc.	0	0	0	0	0	0	0	0	0
Japan and Korea	0	0	0	0	1	1	0	1	1
East Africa	2	1	3	0	0	0	2	1	3
Maghreb	0	0	0	1	0	1	1	0	1
West Africa	4	0	4	3	4	7	7	4	11
Central and South Africa	1	2	3	1	0	1	1	2	4
Greece and Egypt	0	0	0	1	0	1	1	0	1

Appendix table 59: Geographical distribution of Legendary Irish names

Name	Anthroponyms	Places
Amergin	Amergin N=2, Ireland 1, Russia 1; forename N=5, Ireland 1, England 1, South Africa 1, Sweden 1, USA 1	D. in Ireland & Russia / Ireland & Sweden
Arranan	Amerkin Uganda 1/1; forename N=0	D. in Uganda /nil
	Arranan N=0, forename USA 1/1;	D. in nil / USA
	Aranan N=994, Philippines 961, Iran 8, Turkey 7; fname N=107, Thailand 38, Philippines 31, India 17, Malaysia 11	Aranan(creek, Philippines); D. in Philippines/Thailand
	Arrananga USA 3/3; forename N=0	D. in USA / nil
	Arrana N=0, fname N=14, Brazil 7, India 2, USA 2, Iran 1, Philippines 1	Arranah(village, Palestine), Arrāna (locality, India); Arranazpieta (archaeological, Spain); D. in Lebanon & Guatemala / Guyana
Dannan	Dannan N=321, USA 124, England 86, Kuwait 39, Nigeria 14, Syria 13, India 12; forename N=2508, China 2410, USA 54, India 19	Dannan(locality, China), Dannan (locality, Yemen), Dannān (locality, Yemen), Dannān (locality, Pakistan), Muhsin Dannān (locality, Iraq), Kazim Dannān (locality, Iraq), Dannān (province, Saudi Arabia); D. in Kuwait & Qatar / China
	Tannan N=423, Yemen 156, India 114, USA 76, Philippines 28, Iraq 21, Nigeria 9; N=107, India 29, USA 19, Ivory Coast 18, Indonesia 15;	Tannan(hamlet, Yemen), Tannan(hamlet, Taiwan), Tannan(locality, Guilin, China), Tannan(locality, Qinghai, China), Tannan(locality, Japan), Tannan(locality Guangdong, China); D. in Yemen/Ivory Coast/
Espáin	Espáin N=439, Mexico 253, Argentina 86, USA 66, Portugal 28, Australia 1, Chile 1, India 1, Spain 1; fname N=6, Pakistan 3, Spain 1, USA 1, Venezuela 1	Espain(hamlet, Spain), Espain(locality, Belgium); D. in Portugal & Mexico / Venezuela, Spain & Pakistan
	Ispain N=2, Pakistan 1, Spain 1; fname Pakistan 7/7	Ispáin(locality, Iran)
	Esbain N=18, France 17, Philippines 7; fname Mexico 1/1	D. in France/Mexico
	Espaina USA1/1; fname Cameroon 1/1	Spain; D. in USA/ Cameroon
	Espaini Paraguay 1/1; fname N=0	D. in Paraguay/níl
Fodhla	Fodhla N=0; forename N=3, Ireland+England 2, Australia 1	D. in nil/ Ireland
	Fodhlu N=0; forename Nigeria 3/3	D. in nil / Nigeria
Greine	Greine N=176, Germany 74, Brazil 29, Liberia 24, Mauritania 24, Latvia 12, USA 5, Indonesia 4; fname N=30, Indonesia 11, Mauritania 8, Venezuela 5	D. in Mauritania & Latvia / Mauritania
	Kreine N=11, Brazil 6, USA 2; fname Argentina 1/1	D. in Latvia/Argentina
Heremon	Heremon N=0, forename N=3, Brazil 1, Indonesia 1, USA 1; fname N=0	D. in nil/ Brazil & Indonesia
	Heremona N=0; forename N=2, French Polynesia 1, Indonesia 1	D. in nil / French Polynesia
	Heremoni N=0, forename India 1/1;	D. in nil / India
	Heremony N=0; forename South Africa 1/1	D. in South Africa
Kenmare	Kenmare N=144, England 70, Canada 33, Australia 4; forename N=3, Ireland 1, USA 1, Japan 1	Kenmare (village, Ireland), Kenmare (river, Ireland), Kenmare (suburb, South Africa), Kenmare(locality, Western Australia); Kenmare(locality, Victoria Australia); D. in New Zealand & Iceland / Ireland & Japan
	Genmare N=0, fname Ivory Coast 1/1	D. in nil/ Ivory Coast
Milidh	Milidh N=0; fname India 5/5	D. in nil / India
	Milith N=2, England 1, Cuba 1; fname N=26, India 11, Colombia 4, Tanzania 4, Philippines 2, Venezuela 2	Mi'lith (peak, Saudi Arabia); D. in Cuba/Nicaragua
Milesia	Milesia N=4, Uganda 3, Dominican Republic 1; fname N=75, Dominican Republic 31, Chile 17, Brazil 4, Peru 4, Philippines 4, South Africa 4	D. in Dominican Republic & Uganda / Saint Kitts and Nevis & Dominican Republic
	Milesiam N=0, forename Papua NG 1/1	D. in nil / Papua NG
	Milesiana N=0; forename Uganda 1/1	D. in nil/ Uganda
Tuatha	Tuatha N=0; forename N=4, USA 2, Ireland 1, Russia 1;	D. in nil/ Ireland & Russia
	Tuathal Ireland 1/1; forename N=5, USA 3, Scotland 2	D. in Ireland/ Scotland
	Tuathao N=0; forename Thailand 10/10	D. in nil/Thailand
22 name families, 52 names (32 long, 12 short, 8 very short)		

Appendix table 61: Name families that provide a weaker indication of the India→Caspian→Baltic migrations

Name set	Name sets that indicate migrations from India to the Baltic region
Euhemerian	The anthroponyms <i>Uranos</i> , <i>Hiera</i> , <i>Panara</i> , and <i>Panacha</i> seem to have migrated from India to the Baltic Sea via Volga or via Dnepr (p. 176)
Hyksos	<i>Sakir</i> and <i>Chayran</i> seem to have migrated from India to the roots of Volga via the Caspian sea (p. 180).
Mitanni	<i>Parsha</i> and the <i>Kirta/Girta</i> seem to have migrated from India to the Baltic Sea via the Caspian Sea – Volga route (p. 178).
Ancient West African	<i>Magi</i> seems to have migrated from India to Finland and Denmark via Caucasus and Volga (p. 184). <i>Himanto</i> is most common in India, but appears as an anthroponym in India and in Finland.
Ethiopian	<i>Amari</i> and <i>Behati</i> seem to have migrated from India to the Baltic countries via the Black Sea – Dnepr route (p. 179)
Phoenician	<i>Pontus/Pontush</i> seems to have migrated from India to Sweden and Finland via the Middle East and Dnepr (p. 178).
Sea People	<i>Teres/Teresh</i> seems to have migrated from India to the Nordic countries via the Black Sea – Dnepr route and via the Caspian Sea – Volga route (p. 186)
Archaeological West African	<i>Benin</i> seems to have migrated from India to Belarussia via the Black Sea – Dnepr route (p. 182)
Legendary Catalan	<i>Aspa</i> seems to have migrated from India to the Nordic countries via the Caspian Sea – Volga route (p. 191).

Appendix table 62: Individual names as weaker evidence for the India→ Near East connection

Name set	Names that show a migration path from India towards Phoenicia
Kushite	<i>Kush</i> seems to have migrated from India to the Near East via the Middle East (p.181)
Gadeir*	<i>Gadeir*</i> name family seems to have migrated from India and Pakistan to the Sinai, Israel, and Palestine via the Red Sea (p.200).
Legendary Catalan	<i>Tubal/Tupal</i> name family seems to have migrated from India to Near East and the Balkans via the Middle East (p.191). The <i>Basque</i> name family seems to have migrated from Afghanistan to the Basque country via Mesopotamia.
Ethiopian	<i>Amara/Amari</i> name family could have migrated from India to the Near East and the Balkans via Euphrates. Yet, another alternative is that the names migrated to from India to the Mediterranean region around Africa (p.179).

Appendix table 63: Individual name families as additional evidence for the India – East Africa connection

Name set	Names that seem to have migrated from the Indian Subcontinent to East Africa
Fulani	<i>Dangali</i> , <i>Karami</i> , and <i>Nagona</i> seem to have migrated to Uganda from India (p.183).
Sea People	<i>Lukka</i> , <i>Weshesh</i> , <i>Shikala</i> and <i>Teresh</i> seem to have migrated to East Africa from India (p.186)
Etruscan	<i>Achil/Achle</i> and <i>Memrum/Memru</i> seem to have migrated to Ethiopia & South Sudan from India (p.192)
Phoenician	<i>Shama</i> , <i>Barek</i> , and <i>Baali</i> seem to have migrated to Ethiopia from India (p.178)
Gadeir* name family	<i>Gadeirus</i> and <i>Gadeira</i> seem to have migrated to Sudan and Kenya from India (p.200).
Mitanni	<i>Girta</i> seems to have migrated to Somalia from India or Eastern Iran (p.178)
Ancient West African	<i>Magi</i> , <i>Atlant</i> , and <i>Atlantes</i> may to have migrated to Africa from India although the migration from Africa to India is equally possible (p. 184)
Norse Gods and heroes	<i>Fulla</i> seems to have migrated to Somalia and Kenya from India (p.195)

Appendix table 64: Individual name families as additional evidence for the migrations from India to West Africa

Name set	Urheimat (reliability)	Names that seem to have migrated from the Indian Subcontinent to West Africa around the Cape of Good Hope
Fulani	West Africa (8+2)	<i>Karami, Dangali, Nagona, and Mushin</i> seem to have migrated from India to West Africa via East Africa (p.183).
Norse Gods	Corded Ware Europe (8+0)	<i>Nanna, Sandra, and Magni</i> seem to have migrated from India to West Africa via South Africa (p.195).
Archaeological West African	West Africa (8+2)	<i>Benin, Niani, Begho, and Manso</i> (see p.182). Potentially also <i>Nema, Dhar, Savi, Tado</i> and <i>Cana</i> (see Appendix table 23).
Legendary Catalan	Bell Beaker Europe (4+0)	<i>Atipa, Iber, and Tubal</i> (p.191); Spanish colonialism is an alternative explanation.
Legendary Irish	Bell Beaker Europe (8+0)	<i>Tannan, Banba, Milith, and Ir</i> (p. 198); British colonialism is an alternative explanation.
Druidic	Ext. India (4+0)	<i>Anmanna, Ballar, Madan, Manannan, Mananan, Mongan, Murugan, Nesan, and Vinna</i> (p. 196); British colonialism is an alternative explanation.

Appendix table 65: Individual names as weaker evidence for the migrations from India to Western Europe around Africa

#	Name set	Urheimat (reliability)	Names that seem to have migrated from the Indian Subcontinent to Western Europe around the Cape of Good Hope
1	Hyksos	Extended India (7+2)	<i>Sakir-Har</i> seems to have migrated from India to Western Europe via West Africa. <i>Chayan/Khayan</i> seems to have migrated from India to Iberia via South Africa (p.180).
2	Euhemerian	Balkans & Crete (5+2)	<i>Panach</i> and <i>Panara</i> seem to have migrated from India to Iberia and England via South and West Africa (p.176).
3	Gadeir* name family	Extended India (6+2)	<i>Gadeir*</i> seems to have migrated from India to Iberia via Sub-Saharan Africa (p.200).
4	Potentially Atlantean	Extended India (3+2)	<i>Atlantis, Gades, Ampere</i> and <i>Mestor</i> seem to have migrated from India to Iberia via West Africa, although the Mediterranean route is another alternative (p.201).
5	Druidic	Extended India (4+0)	<i>Ballar, Madan, Murugan, Mongan, Vinna, Anmann(a), Manannan, Mongan, Murugan, Tennisan, and Madan</i> are more common in India than they are in the Bell Beaker Europe (see p.196), but this could be explained by British colonialism.
6	Legendary Irish	Bell Beaker Europe (8)	<i>Banba</i> seem to have migrated from India to Ireland around Africa (p.198). <i>Mil</i> and <i>Espain</i> seem to have migrated to Ireland and Iberia from Pakistan, although migration via Middle East is an alternative route.
7	Norse Gods	Corded Ware Europe (8)	<i>Aesir, Sandra, and Magni</i> seem to have migrated from India to Western Europe via South and West Africa (p.195).
8	Legendary Catalan	Bell Beaker Europe (4)	<i>Iber(ia), Basque, and Atipa</i> seem to have migrated from the Indian Subcontinent to Iberia via West Africa (p.191).
9	Archaeological West African	West Africa (8+2)	<i>Manso</i> seems to have migrated from India to Western Europe via West Africa (p.182).

Appendix table 66: Individual name families as weaker evidence for the India – Central Africa – Chad migrations

Name set	Names that indicate migration from India to Nigeria via Central Africa and Chad
Potentially Atlantean	<i>Gade* and Gadar</i> seem to have migrated to West Africa via East and Central Africa (p.201)
Legendary Catalan	<i>Atipa/Atiba</i> may have migrated from India to Nigeria via Tanzania and Southern Chad (p.191).
Fulani	<i>Dangali</i> may have migrated from India to Niger via Uganda (p. 183),

Appendix D: Lexical similarities between Dravidian and some other languages

Appendix table 67: Similarities between Basque and some Dravidian languages

Dravidian word	Language	Meaning	Basque word	Meaning	Similarity of form	Similarity of meaning	Similarity (multiplied)
ir	Brahui	sister	arre	sister	82 %	100 %	82 %
kan	Brahui	to know	ikan	to look	90 %	80 %	72 %
in	Brahui	to say	min	tongue	90 %	80 %	72 %
kukk	Central Dravidian	summit, peak	kukula	summit, top of a tree	75 %	100 %	75 %
marru	Dravidian m general	enemy	not found (amaru)	cunning, shrewd	0 %	90 %	0 %
kira	Gondi	old man	kira	age	100 %	80 %	80 %
ola	Kannada	inside	ola	cabin, hut	100 %	90 %	90 %
unmu	Kannada	birth	ume	child	74 %	80 %	59 %
sala	Kannada	to enter	salazar	country house	80 %	90 %	72 %
gubbi	Kannada	hump	gupi	deformed spine	90 %	90 %	81 %
kappu	Kannada	meat	kaba(l)	domestic animal	81 %	90 %	72 %
eru	Kannada	dung	errai	dung	76 %	100 %	76 %
mugu	Kannada	face	musu	face	77 %	100 %	77 %
mugul	Kannada	flower bud	mugil	flower bud	95 %	100 %	95 %
bhala	Kannada	forehead, brow	belar	forehead	83 %	100 %	83 %
gol	Kannada	throat	golo	goiter	90 %	90 %	81 %
hikku	Kannada	heart	biho(tz)	heart	59 %	100 %	59 %
appu	Kannada	to embrace	apa, apatz	kiss	86 %	90 %	77 %
buti	Kannada	man servant	botoi	man servant	89 %	100 %	89 %
pal	Kannada	milk	galatz	milk	50 %	100 %	50 %
amma	Kannada	female	ama	mother	95 %	90 %	86 %
ba	Kannada	mouth	abo	mouth	74 %	100 %	74 %
gadda	Kannada	chin	ganga	mouth	70 %	90 %	63 %
kebi	Kannada	cave, hollow	koba	nest, hollow	91 %	90 %	82 %
ana	Kannada	breath	asnasa	respiration	60 %	80 %	48 %
bar	Kannada	stream, to flow	ibar	river valley	90 %	80 %	72 %
konku	Kannada	something bent, rounded	konkur	roundness	90 %	90 %	81 %
karata	Kannada	skull, coconut	garaun	skull, brain	55 %	100 %	55 %
usir	Kannada	breath	usna	smell	67 %	90 %	60 %
muti	Kannada	face	mutur, mustur	snout	85 %	90 %	76 %
musu	Kannada	to smell	mutur, mustur	snout	79 %	80 %	63 %
turu, tura-i	Kannada	drizzle, to gush forth	t-turri, iter, tur	spring, fountain	90 %	90 %	81 %
sindu	Kannada	bad smell	sund-da	stink	81 %	90 %	72 %
begu	Kannada	to spy	behatu	to observe	52 %	90 %	47 %
alasu	Kannada	exhausted	lazu	weak man	85 %	70 %	59 %
asa	Kui	daughter	aizpa	sister	65 %	70 %	45 %
garo	Kui	deep, hollow, dig	goratu	to raise, to carry up	64 %	90 %	58 %
mula	Malayam	brain	muin	brain	69 %	100 %	69 %

ali	Malayam	woman	alaba	daughter, native of...	77 %	80 %	61 %
ali	Malayam	woman	ala	girl	97 %	90 %	87 %
iracci	Malayam	meat	aragi	meat	85 %	100 %	85 %
men	Malayam	mound, hillock	mendi	mountain	80 %	80 %	64 %
kar-utti	Malayam	neck	garondo	nape of the neck	69 %	90 %	62 %
tottu	Malayam	nipple	titi	nipple	83 %	100 %	83 %
iru	Malayam	to give birth, to conceive	errun	to lay eggs	84 %	80 %	67 %
pura	Malto	belly	para	belly	91 %	100 %	91 %
muso	Malto	nose	musu	face	99 %	90 %	89 %
atta	Malto	grandfather	aita	father	85 %	80 %	68 %
kuku	Malto	summit	kukula	summit, peak	80 %	100 %	80 %
ura	North Dr.	wife, house	urru-xa	female	66 %	90 %	59 %
khala	proto- Dravidian	blackguard, thief	kaldar	thief	50 %	100 %	50 %
bhuka	proto- Dravidian	hole, opening	bukatu	to end	75 %	80 %	60 %
adu	S.Dr	age	adin	age	85 %	100 %	85 %
manku	S.Dr	staggering	mainku	crippled, lame	90 %	80 %	72 %
apa	S.Dr	father	ata	father (child's)	92 %	90 %	83 %
ala, alal, allal	S.Dr	affliction	alusu	feeble, weak	71 %	90 %	64 %
adi	S.Dr	foot	adar	foot of chair	87 %	90 %	78 %
bhala	S.Dr	forehead, brow	belar	forehead	83 %	100 %	83 %
burade	S.Dr	head	buru	head	71 %	100 %	71 %
bikku	S.Dr	heart	biho(tz)	heart	82 %	100 %	82 %
gasi	S.Dr	hunger	gose	hunger	91 %	100 %	91 %
adu	S.Dr	village	padur, etxe	lake, dwelling	80 %	80 %	64 %
manju	S.Dr	amiable	maina	liking, pampering	61 %	80 %	49 %
al	S.Dr	male , husband	tl-o-(ba)	nephew	70 %	80 %	56 %
kebi	S.Dr	cave, hollow	koba	nest, hollow	91 %	90 %	82 %
kara	S.Dr	height	gara	notion of height, head	95 %	90 %	85 %
usir, usuru	S.Dr	nose	urn	perfume	54 %	80 %	43 %
ari	S.Dr	rock	arri	rock	95 %	100 %	95 %
konku	S.Dr	something bent, rounded	konkur	roundness	90 %	90 %	81 %
tkuri	S.Dr	short	korro	short	68 %	100 %	68 %
iri	S.Dr	sick	eri	sick	99 %	100 %	99 %
naru	S.Dr	odor	narru	skin	95 %	70 %	67 %
lamba	S.Dr	to totter	laban	slippery, sliding	70 %	90 %	63 %
tkittu	S.Dr	small	kuto	small	69 %	100 %	69 %
pen	S.Dr	woman	pena	sorrow, grief	90 %	90 %	81 %
kadi	S.Dr	to steal	kaldar	thief, scoundrel	67 %	80 %	53 %
ir, iru, il	S.Dr	to be	-	to be	0 %	100 %	0 %
iru	S.Dr	to give birth, to conceive	errun	to lay eggs	84 %	80 %	67 %
suri	S.Dr	to pour	isuri , i-surt	to pour	90 %	100 %	90 %
aks	S.Dr	sight	ikus	to see	87 %	90 %	78 %
kaj	S.Dr	to steal	kar	to take	82 %	90 %	74 %
murru	S.Dr	wall	murru	wall	100 %	100 %	100 %
putti	S.Dr	to be born	puta	womb	92 %	80 %	73 %
pukku	S.Dr	vulva	puta	womb	79 %	80 %	63 %
ana	Tamil	brother	anai	brother	90 %	100 %	90 %

ala, alal, allal	Tamil	affliction	alusu	feeble, weak	71 %	90 %	64 %
maru-vu	Tamil	intimacy	marruskatze	fondling, pawing	55 %	80 %	44 %
maintu	Tamil	love	maita	love	71 %	100 %	71 %
ema	Tamil	mother, female	ama	mother	98 %	90 %	88 %
kebi	Tamil	cave, hollow	koba	nest, hollow	91 %	90 %	82 %
ila	Tamil	youth	iloba	niece	72 %	90 %	65 %
kiram	Tamil	old	kira	period of time	90 %	90 %	81 %
maran	Tamil	bravery	mardul	robust, strong	60 %	80 %	48 %
karai	Tamil	to cry out	garrasi	shrill, cry	60 %	90 %	54 %
motu	Tamil	stupidity	mutur	snout	89 %	90 %	80 %
malagu	Tamil	to perish	malgu	soft, weak	90 %	80 %	72 %
tura-i	Tamil	fountain, fordable stream	t-turri , iter, tur	spring, fountain	80 %	100 %	80 %
uru	Tamil	to give birth	aru	to be born	91 %	80 %	73 %
il	Tamil	to exist	-	to exist	0 %	100 %	0 %
adi	Tamil	death	amata	to kill	60 %	80 %	48 %
iru, irru	Tamil	to give birth, to conceive, to bring forth	errun	to lay eggs	84 %	90 %	76 %
kara	Tamil	to wash	garastatu	to sprinkle, to water	75 %	90 %	67 %
kaj	Tamil	to seize	kar	to take	86 %	80 %	68 %
ul	Tamil	to exist	ulertu	to understand	60 %	80 %	48 %
alasu	Tamil	to rinse	latsatu	to wash	31 %	80 %	25 %
alku	Tamil	vulva	alu	vulva	80 %	100 %	80 %
muram-pu	Tamil	quarry	murru	wall	65 %	100 %	65 %
pani	Tamil	rain	panin	water	90 %	90 %	81 %
mukka-ra	Telugu	nose-ring	moko	beak	66 %	80 %	53 %
odal	Telugu	body	odol	blood	92 %	80 %	74 %
buru	Telugu	something round	bular/burar	breast	81 %	90 %	73 %
elli	Telugu	night	ilun	darkness	79 %	90 %	71 %
anga	Telugu	stride	anka	foot	95 %	80 %	76 %
eriyu	Telugu	to grieve	auri	lamentation	68 %	90 %	61 %
borra	Telugu	potbelly	zilbor	navel	55 %	80 %	44 %
ele	Telugu	song	ele	story	100 %	80 %	80 %
ala	Telugu	wave, surge	olatu	wave	72 %	100 %	72 %
kabi	Tulu	cav	koba	cave	89 %	90 %	80 %
kai	Tulu	hand	uka	hand	80 %	100 %	80 %
karu	Tulu	leg	garra (Navar)	leg	81 %	100 %	81 %
tshika	Tulu	small child	txiki	small	92 %	90 %	82 %
kerki	Tulu	throat	gurka	throat	85 %	100 %	85 %
murru	Tulu	wall	murru	wall	100 %	100 %	100 %

Appendix table 68: Similarities between Dravidian and Finnish words

Dravidian (and other Asian languages)	Finnish (and other European languages)
Word list based on Hirvonen (2023)	
Amma (mother, Kannada and Malayam) Ama (mother, Tibetan and Sumer.)	Emä (mother), Ama (Mongolian, Turkish, Basque).
Nalu (four, Malayam)	Neljä (four)
Vatti (basket, Malayam)	Vati (basin)
Tuuli (blow in the wind, Malayam)	Tuuli (wind)
Ei (no, Malayam)	Ei (no)
Ulla, olla (be, exist, Malayam)	Olla (to be)
Kol/kolluka (die, kill, Malayam)	Kuolla (die, pass away)
Kudi/kudil (house, Malayam)	Koti (house)
Kayyi, kai (hand, arm, Malayam)	Käsi (hand, arm)
Puu (flower, Malayam)	Puu (tree)
Piri (screw thread, Malayam)	Piiri (circle)
Muusari (foundryman, Malayam)	Muurari (mason)
Word lists based on Lahovary (1963) and Winters (1985, 5-6); to be treated with critical caution (the existence of these words in some specific Dravidian language has not been confirmed)	
Kukk (summit, peak, Central Dravidian)	Kukkula (hill) ← Kukku (Proto-Finnic)
Alku (vulva, Tamil)	Alku (beginning) ← Alku (Proto-Finnic)
Amaru (deluge, Dravidian), Maari (deluge, Sumerian)	Meri (sea) ← Meri (Proto-Finnic)
Tkittu (small, Southern Dravidian)	Kitu (slow in growth) ← Kitu (Proto-Finnic)
Agga, aga (to command, Dravidian), Akkinai (command, Sumerian)	Akka (woman of power) ← akka (Proto-Finnic)
Ma (exalted, Dravidian), Mahdi (exalted, Sumerian)	Mahti (power) ← Mahtiz (Proto-Germanic)
Kunru (mountain, Dravidian), Kuru (mountain, Sumerian)	Kuru (gorge)
Sila (road, Dravidian), Sila (road, Sumerian)	Silta (bridge) ← Cilta (Proto-Finnic)
Murru (wall, Southern Dravidian), Murru (wall, Tulu)	Muuri (stone wall) ← Mur (Swedish)?
Ala (wave, Telugu)	Aalto (wave) ← aldō (Proto-Germanic) ← ald

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