Indo-European Expansion Cycles

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Hypothetical solutions to the 'homeland problem' in Indo-European studies are often hampered by the lack of clear causes for the expansion of the IE languages. The author uses a recently developed model of *expansion cycles* to address this situation. The model suggests that cultures comprised of several autonomous political units often constitute *competitive systems* which, through their inner dynamics, produce massive expansions after some centuries of competition. Using this model, the author finds that an intermediary solution between the Kurgan and Neolithic hypotheses seems to best fit the evidence. This suggests IE origins on the forest-steppe around the 4th millennium BC in the Cucuteni-Tripolye culture.

Instead of seeing the wide distribution of Indo-European (IE) languages as a problem, we can see it as evidence. Something happened, probably around the 4th millennium BC, that caused the IE languages to start spreading over most of Europe and much of Asia, eventually to spawn the languages spoken by almost half of mankind. Whatever it was, it must have been quite unusual, spectacular and historically important. This importance has nothing to do with the IE languages as such. IE expansion did not take place because of some grammatical features of these languages; their spread is simply the smoking gun, the remaining evidence of an expansion that started around five or six thousand years ago. From this point of view, it is quite irrelevant what language was spoken at the core of the expansion; what matters is that the language dispersal that took place is evidence of an expansion that profoundly affected the societies involved. We don't know what sort of expansion it was or why it happened and current theories about the IE

'homeland' problem do not satisfactorily answer these questions – some don't even ask them.

If we simply concern ourselves with finding the IE homeland we may be able to find a place in time and space but this wouldn't really tell us much of importance unless we also understood why the IE languages expanded. The approach taken in this paper is to focus on causes; to ask what actually happened that compelled IE languages to start spreading around the globe. The significance of this question goes far beyond the IE homeland problem because it relates to some fundamental issues about human migrations or cultural distribution in general. However, if we have some idea that might explain the IE expansion, this may help us identify where and when it started which, in turn, may help us verify the idea and fill in the details of what actually happened.

As a historian, my knowledge of archaeology is far inferior to that of those archaeologist that have considered the IE problem and my knowledge of linguistics is similarly inferior to that of historical linguists. However, as a macro-historian, I have studied how things *generally* occur in history and in recent years I have primarily been concerned with *expansion cycles* that have caused many societies to undergo episodes of massive population growth, conquests and migrations. Such expansion cycles may very well be relevant to the expansion of IE languages.

Previous Solutions

Most previously proposed solutions to the IE homeland problem have difficulties finding a believable explanation as to why the expansion occurred. At least one of them hardly even tries. This is Gamkrelidze and Ivanov's Armenian theory. They place the IE homeland in eastern Anatolia, in or around Armenia, based almost exclusively on their interpretation of the linguistic evidence (Gamkrelidze & Ivanov 1984/1995: 757-90).[1] Archaeology

[1]Some of their arguments are quite absurd, like the following (p. 764): "Another set of words connected with climatic phenomena precludes locating the Indo-E7uropean proto-homeland in the northern regions of Eurasia: ***g^{ho}er-m-** and ***t^{h}ep^{h}-** 'heat, warmth'." Although this kind of

is only considered as an afterthought to see how it can be fitted to this homeland and, by their own admission, failing to identify the culture of Proto-Indo-European (PIE) in the archaeological record (Gamkrelidze & Ivanov 1984/1995: 787).

The authors have a habit of interpreting links with the old civilizations of the Near East as indicating close proximity, apparently forgetting that the only reason we know of such connections, rather than other contemporary ones, is that, because of their written records, we know a lot more about these civilizations than any of their illiterate contemporaries (e.g. Gamkrelidze & Ivanov 1984/1995: 779-83). Their reliance on such evidence systematically and erroneously shifts the IE homeland in the direction of the known literate civilizations and away from illiterate cultures.

Gamkrelidze and Ivanov also offer no explanation as to why the IE population expanded so spectacularly rather than any of their close neighbours in the Near East who must have had very similar cultures and economies. Nevertheless, IE expansion alone is supposed to have maintained momentum for millennia through a very contorted migratory pattern, which is almost totally unsupported by archaeological evidence (Gamkrelidze & Ivanov 1984/1995: 791-852).

The Armenian hypothesis does not offer a serious explanation for IE expansion. It has to be said that any reasonable hypothesis must explain the IE expansion and all the relevant evidence, not just the evidence provided by one discipline. The IE homeland problem is, by its nature, a multidisciplinary problem and ignoring evidence from other disciplines is not the right way to go about solving it.

The linguistic evidence is far from being as unambiguous as Gamkrelidze and Ivanov claim and most linguists remain sceptical of their theory (for a detailed critique of their linguistic arguments see D'iakonov 1985). In fact, most linguists today would refrain from pointing to an exact location when asked to identify the IE homeland

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reasoning does not inspire confidence, the evidence Gamkrelidze and Ivanov have accumulated is extremely useful.

based on the PIE lexicon although most would agree that terms referring to cultural and natural phenomena indicate some place in the temperate zones of eastern Europe or western Asia around the 4th millennium BC. Seriously considered theories mostly indicate some region close to the Black Sea (see Mallory 1989: 158-164; Mallory & Adams 2006: 448-449; Sherratt & Sherratt 1988/1997: 476; also Renfrew 1987/1989: 77-86).

Another popular solution to the homeland problem is to account for it by the original spread of agriculture through Europe by Neolithic farmers. This solution has the important advantage of actually providing a believable explanation for the expansion of languages and one may surmise that it was precisely the lack of believability of other solutions that spawned it. As farming spread over Europe it must often have done so through colonization by farmers who naturally would have brought their language along. As farming populations are usually much larger than hunter-gatherer populations in similar surroundings, it is quite easy to imagine that, as farming spread through Europe, the farmers' language became correspondingly widespread and thus created the base of IE speakers. Such farming populations could also have spread towards India perhaps from an original base in Anatolia, in that heartland of early farming, or later, through the Eurasian Steppes.

The most celebrated of such *Neolithic hypotheses* is the one proposed by Colin Renfrew in 1987 (Renfrew 1987/1989 and Renfrew 1999). Although Renfrew has revised his theory to accommodate objections and new evidence, a central problem still remains: the time doesn't easily fit. Farming started to make inroads into Europe around 7000 BC and agricultural communities were established over much of central and eastern Europe by around 5000 BC. It is hard to imagine that all these widespread populations still spoke a single language. Unfortunately, it seems that the unified PIE language cannot have existed much earlier than about 4000 BC, before it started to break up into different branches. One crucial piece of evidence for this is the fact that the vocabulary for the wheel and related technologies seems to be indigenous to PIE. The earliest evidence for wheels comes from the 4th millennium BC, from a wide area

covering western Asia and eastern and central Europe. We don't know exactly where the wheel was invented but it evidently spread very quickly throughout this region.[2] If the Indo-Europeans were already speaking differentiated languages by that time we would not expect to be able to reconstruct the wheel-lexicon to PIE. On the contrary, we would expect the different branches of IE to use different neologisms or recognizable loanwords. This just isn't the case and it seems unavoidable to conclude that at the time the wheel was spreading among PIE populations, not much sooner than the mid 4th millennium BC, they still spoke mutually intelligible dialects. This means that their initial expansion could not have started earlier than the late 5th millennium BC (see Anthony 2007: 63-75).

The third and presently most popular solution to the homeland problem doesn't have this chronological difficulty although it lacks a good explanation for early IE expansion. This is the *Kurgan hypothesis* that, in various guises, has been advocated by many scholars, from Gordon Childe, through Marija Gimbutas to David Anthony who is currently its most vocal spokesman. J. P. Mallory also gives it a lukewarm support in considering it the 'least bad' solution (Mallory 1997: 115).

The Kurgan hypothesis derives its name from the burial mounds that dot the south Russian steppes (*kurgan* is Russian for burial mound) and its central postulate is to place the IE homeland somewhere on the steppes that stretch from the Pontic region of southeast Europe into central Asia. The Proto-Indo-Europeans are seen as nomadic or semi-nomadic steppe-dwellers that based their livelihoods mainly on raising livestock to graze the vast grasslands of this region. For the adherents of this hypothesis, it is hard to avoid explaining IE expansion through the domestication of the horse and, indeed, this is the path taken by most of them, emphatically by Anthony in his recent book, *The Horse, the Wheel and Language* (Anthony 2007; see also Gimbutas 1979: 114). The domestication of the horse is proposed as the reason for the expansion of the steppe population that may have

[2]Proto-Indo-Europeans may even have invented the wheel (see Parpola 2008).

taken place on the Pontic-Caspian steppe in the 5th millennium BC (according to Anthony 2007: 200). With horses providing unprecedented mobility, these populations supposedly gained a decisive military advantage over their neighbours allowing them to expand in all directions, both into the Asian steppe but also to the west into Europe, not stopping at the edge of the steppe but somehow managing to implant their language also in the central and north European populations.

There are some problems with this scenario. Evidence for early domestication of horses is scanty and, in many ways, remains problematic (for a concise overview of this debate, see Darden 2001: 193-195; for a perceptive discussion of the evidence see Levine 1999). The full domestication of the horse may have been a long drawn out process that not only involved the development of horse harness and handling techniques but also the physical and behavioural transformation of a skittish wild animal (see Dietz: 2003). Anthony and others have pointed to what they claim to be evidence of early riding gear but this evidence seems far from conclusive (Anthony 2007: 193-224). Even if it did turn out to be valid, there would still be room for doubt as to how effective, useful or common this horsemanship was (see Kohl 2007: 137-144).

The emphasis on the horse obviously involves an analogy drawn from later horseback conquerors from the steppe. The nomadic warriors from the steppes have time and again put the surrounding civilizations severely to the test, using their horses to significantly increase their military effectiveness. It may seem straightforward to simply assume something similar for the 4th millennium BC – but it's not. The steppe nomads only became such fearsome warriors from around 1000 BC when they adopted more effective riding gear and developed new breeds of horses. In fact, it is only from this time onwards that we find extensive evidence of horseback warriors (e.g. Drews 1993: 165-166). Certainly horses were sometimes used for riding before that time but there seems to be good reason to doubt the effectiveness or even the existence of any earlier cavalry force.

Indeed, had effective horseback warriors already existed in the 3rd millennium there would have been no

need to develop the light and complex war chariots that emerged around 2000 BC (see Kuz'mina 2007: 109-115; Anthony 2007: 397-405). The predominance of chariots during the 2nd millennium BC would have been inconceivable had there already existed usable cavalry forces, much larger, more cost effective and versatile than chariots. It was only the emergence of true cavalry, about a thousand years later, that spelled the end of chariotry.[3] If horseback warfare already existed before that time, why wasn't it preferred over chariotry? If a society already knows how to mass-produce repeating rifles why would it equip its army only with handmade bows and arrows?

Chariotry itself appeared much too late to explain anything about the original IE expansion. It is even highly questionable that chariotry could explain any such expansion because the chariots were intricate constructions and expensive. Therefore, no polity could possibly equip but a small proportion of its population with chariots even if horses were plentiful (Drews 1993: 106-113). Chariot warfare was for elite warriors only and the relevant technology and skill was easily copied between competing elites so that no elite-dominated polity gained but the most temporary advantage through use of its new chariot force. Where large-scale conquests were effected by chariotry they would typically result in a small foreign elite of chariot users lording it over a much larger number of locals whose indigenous language would prevail in the long run. Therefore, chariots are not the kind of technology that can explain large-scale linguistic change.

Even if we were to accept the early adoption of horseback riding proposed by Anthony and others, a problem still remains. The analogy with the later nomadic conquerors doesn't really suffice to explain any language displacement in Europe, outside the steppe environment. Europe has suffered numerous such invasions from peoples such as the Scyths, Sarmatians, Alans, Huns, Avars, Magyars and Mongols to name but a few. Even if many of these invasions were quite successful, not a single one of these

[3]Although the emergence of popular warfare during the Bronze Age collapse (ca. 1300-1100 BC) had already deprived chariotry of some of its pre-eminence (see Kristinsson 2010: 40-55).

peoples managed to implant their language significantly outside the steppe environment. Most of these have left no or trivial linguistic evidence in Europe and only one, the Magyars, have managed to preserve their language at all in Europe west of the steppe. The fact that they established the Hungarian state around a small steppe core on the Hungarian Plain and then became a 'normal' European nation is probably the reason why their language alone survived. Neither have the nomadic invasions from the steppes left many linguistic marks on other bordering civilizations such as in China or in India. The Turks of Anatolia and Iranians of the Iranian Plateau managed this but they, like the Magyars, had the benefit of operating from steppe environments at the core of their realms and they established effective states to consolidate their conquests. But states did not exist in 4th millennium Europe and it is hard to avoid the conclusion that an invasion of horsemen from the steppe simply isn't sufficient to explain the diffusion of IE languages in settled agricultural communities.

Nevertheless, this diffusion of IE languages must be explained somehow. The most common explanation used by authors adhering to the Kurgan hypothesis is to invoke 'elite dominance'. Usually this involves no elaborate argumentation (although this does not apply to Anthony, below). It is simply assumed that once an IE speaking elite had conquered the indigenous peasant population, the locals found it to their benefit to adopt the language of their conquerors. An example of such language displacement through elite dominance is found in how the Romans implanted their language in the lands they conquered. Unfortunately, this doesn't quite add up. There are several examples in European history where we find a conquering elite speaking a different language from the indigenous population and usually it is the conquerors' language that disappears. The Lombard invaders in Italy became Italian speakers, the Franks in Gaul adopted the Romance languages of their subjects, and the Vikings in Normandy became French-speaking Normans who in turn became English speakers after they conquered England.

Even the Roman example isn't all that relevant when we take a closer look. The Romans did not implant their

language in the eastern half of their empire, except in some pockets in the Balkans, probably through colonies established by veteran soldiers. Rome also had an effective and strong central government that would have facilitated the linguistic change. Nevertheless, it only succeeded where there were significant settlements of Latin speaking veteran soldiers such as in Spain, Gaul and parts of the Balkans, not to mention Italy itself. Centuries of Roman government was not enough to eradicate the indigenous language of Britain, which still survives in Wales and Brittany to where many Romano-British emigrated during the Great Migrations. It seems that for this kind of language displacement to work we need both a strong, centralized state and a significant immigration, or some kind of reshuffling of the non-elite population within a territorial state, using a common language for communication. Under such circumstances, an indigenous language can be displaced even if the population didn't change much as happened in parts of the Roman Empire, in Ireland under British rule or in large parts of Latin America under Spanish rule. However, it would seem that the appearance of a new elite, speaking a foreign language, is hardly *enough* to effect a linguistic shift. Such examples, at least, are hard to come by. For elite dominance to work as a vehicle of language displacement it needs assistance from other elements such as a territorial, centralized state and such a thing simply did not exist in the 4th millennium BC.

Another process of language displacement is often invoked, a process we can call the Baluch-process after the Baluch tribes of western Pakistan who encroached on the territories of the Pathan tribes to their north (Barth 1963/1981). Each ethnic group included both settled cultivators and semi-nomadic herdsmen but the hierarchical Baluch political organization more readily offered outsiders access to acceptance and social advancement. The more horizontal organization of the Pathan tribes was not as welcoming with the result that in unsettled times, when many people were forced to seek opportunities wherever they found them, the Baluch tribes expanded by incorporating large numbers of Pathans. Although the Baluch-process is quite interesting, we

should perhaps question its relevance to the original IE expansion and ask ourselves why the IE communities were so special in this respect and why other linguistic communities never seem to have produced comparable language expansion through this process.

According to Anthony, the way to explain the emergence of IE dialects in central and northern Europe is through elite dominance and a network of patron-client relationships where the clients adopted the language of their patrons (Anthony 2007: 360, 369-370; Anthony 2008). He is aware that not all elite dominance results in linguistic shift but, by mixing together elite dominance and the Baluch-process, he proposes that elite dominance only results in language shift when the foreign elite is ready to accept indigenous elements, providing them with a pathway for advancement. In this way, locals would be ready to adopt the language associated with the rulers. However, as the Baluch-process and Anthony's version of it seem to be rather slow, it has to be doubted that they could account for the sweeping expansion of the IE languages from the Atlantic to the Indian Ocean.

These patron-client relationships would have had to extend down the whole social ladder affecting language change at each level, which seems problematic because it assumes that everybody had a real chance of social advancement and found it pertinent to try to climb the social hierarchy. In most stratified societies this is not the case. Although Anthony finds an example that he thinks illustrates this process in northern Uganda and southern Sudan, there is no special reason to assume that this process is relevant to IE expansion in Europe (Anthony 2007: 117-118). As it hasn't been verified at all in European history unlike some other processes of language displacement, it certainly doesn't seem to be the best choice.

This is definitely not how the subjects of the Roman state adopted Vulgar Latin (above). Anthony claims the reason that some conquerors who became elite rulers, such as the Normans in England or the Galatians in Anatolia, didn't manage to implant their language was that they weren't ready to incorporate local elements into their hierarchy. He says: "Immigrant elite languages are adopted

only where an elite status system is not only dominant but is also open to recruitment and alliance" (Anthony 2007: 118). This seems to be a case of special pleading as Anthony adds new conditions to make the evidence fit his model. In this way the actual conditions that would result in linguistic change are narrowed down making it harder to believe that the model could explain any linguistic shift on a grand scale. But even these narrow conditions don't seem to result in linguistic shift in most cases. The Franks who conquered Gaul as the Roman Empire crumbled, readily accepted Gallo-Romans as their partners. The Gallo-Roman elite gradually shifted its identity, even adopting Frankish names, as it merged with the Frankish elite (James 1988: 83-84, 108-109, 191-193). Nevertheless, the language remained Romance. One may indeed suspect that, contrary to what Anthony believes, the willingness to accept locals into the elite's hierarchy would often facilitate the spread of the *indigenous* language among the elite rather than the other way around.

For any elite dominance model to work we will have to assume a significant level of social stratification as IE dialects spread through central and northern Europe. The prime vehicle of this diffusion would have to be the Corded Ware culture and Anthony acknowledges this (Anthony 2007: 367-368). The Corded Ware and the similar Bell Beaker cultures (below) have often been seen as more hierarchical than the cultures that they replaced. This is based on a very questionable interpretation of the evidence and may simply be due to the 'evolutionary' approach in archaeology and anthropology, which tends to see societies progressing, often in discreet steps, in a line from the simple to the more complex and seems to have little to do with Darwinian evolution (see e.g. Yoffee 2005: 4-41).[4] Recently, Vander Linden has lucidly criticized this notion and argues instead that these extensive cultures of the 3rd millennium BC were characterized by increased

[4]The central idea of Darwinian evolutionism is (natural) selection, a concept that is rarely even mentioned in relation to modern versions of social (anthropological) evolutionism. Perhaps this is because of the racist connotations many attach to natural selection when applied to humans.

social equality (Vander Linden 2007: 187-188 and *passim*; see also Vander Linden 2006 and Whittle 1996: 285-286), which fits well with my expansion cycle model (below). With social equality, we don't have much of an elite to dominate anything, let alone affect a linguistic transformation.

Finally, it has to be seriously doubted that dominance by a foreign elite, a small minority by definition, was even possible at this early point in time. The instruments of elite warfare, especially chariots and superior weapons and armor made of bronze, only appeared around 2000 BC (e.g. Kristiansen & Larsson 2005: 213-227 and *passim*). Before that time, elite warfare where a small number of well-equipped and trained warriors could out-fight much larger numbers of commoners, probably did not exist (for elite warfare, see Kristinsson 2010: 15-17 and *passim*). As a consequence, a small group of foreigners would find it very difficult indeed to take power by force, even in the unlikely event that the locals had somehow become unaccustomed to defending themselves. It is very doubtful that this sort of thing happened at all before ca. 2000 BC.

Although Germanic conquerors set themselves up as social elites when they conquered large slices of the Roman Empire, elsewhere, such as in Britain, they came in large numbers and settled as farmers. In these cases, the language changed. In recent years, such migrations are curiously seldom invoked to explain IE expansion. Barbarian migrations are well documented in European history. Gauls, Germans and Slavs all went through massive migrations with corresponding language displacement that significantly redrew the linguistic map of Europe, not just once but three times over. The linguistic effects of the first of these expansions have disappeared because of subsequent ones but the other two are still very much a part of European reality. Today, about 95% of the European population natively speak languages of just three IE subfamilies: Romance, Germanic and Slavic. Before these groups started to expand, say around 400 BC, only a small minority of Europeans spoke languages ancestral to these, probably less than 10%. So here we have historical examples of large-scale and very effective linguistic transformations and it has to be relevant to take a closer

look.

Did any of these massive linguistic shifts happen through some kind of elite dominance or Baluch-process? The Romance expansion was primarily effected by state dominance and colonization by veteran soldiers, which I suppose could be called a kind of elite dominance, but it bears only the slightest similarity to the elite dominance being proposed for IE linguistic expansion. As for Germanic and Slavic, these were just plain old barbarian migrations and there seems to be no good reason why something similar could not have happened in the 4th and 3rd millennia BC. If we include the Gauls, we know how four major cases of language displacement happened in early historical Europe and none of them bears much similarity to the elite dominance model of IE expansion, nor the Baluch-process nor Anthony's hybrid model. Since statehood excludes Romance expansion as a relevant example we are left with Gallic, Germanic and Slavic expansions as relatively well known cases of barbarian migrations causing massive linguistic displacement; cases that may very well show characteristics similar to IE expansion.

Although the events of some barbarian migrations are well known through historical sources they are not well understood which may be the reason why they are seldom mentioned in relation to the IE problem. However, we would be well advised to remember that a substantial movement of population is the only process that has verifiably caused swift and large-scale linguistic displacement in state-less agricultural societies. However it began, IE expansion had to occur in such societies early on. Therefore, if we can discern what generally caused such expansions or how they worked we would also have a promising hypothesis towards an explanation of IE expansion.

Expansion Cycles

In a recently published book, I consider the question of why some societies expand through population growth, military conquest and migrations (Kristinsson 2010). Examples of such episodes are many in European history and include, among others, Archaic Greece, the Gauls, the

Germanic barbarians, the Slavs, Vikings and modernizing Europe of the 19th and 20th centuries. I conclude that there was a common mechanism at work behind such expansions and that there are at least three variations on this theme. One of these variations (*imperial expansion*) is not relevant here but the other two are.

The simplest kind of expansion cycle is *colonizing expansion*. This is triggered when new land becomes available by some historical chance or process such as finding new land that was previously unknown, had become empty for some reason (e.g. previous out-migration) or if new methods were developed that made previously unproductive land suitable for farming. The prime mover here is newly available land and this leads directly to colonization, which means that more people have the means to raise and support families. In past agricultural societies, access to land was usually a precondition for being able to start a family. When land was easily attainable, more people could do this and at an earlier age which resulted in vigorous population growth. The growing population needed ever more land and therefore the population and culture also expanded geographically, at least as long as land was available.

Land that is truly empty of human inhabitants and still suitable for settlement by a farming population has long since become hard to find. It is not unknown for colonizing farmers to occupy such lands, like Iceland in the Viking period, but in most cases colonizing expansions proceeded through areas that had some previous inhabitants – just not enough of them to be an effective obstacle. In these instances the indigenous population was often made up of hunter-gatherers and this is precisely the reasoning behind the Neolithic hypothesis (above). If farming was spread throughout Europe by colonizing farmers rather than by local adoption – and there is an ongoing debate on the matter – this would indeed be an example of *colonizing expansion*.

However, whether the indigenes were farmers or foragers was of secondary importance. Farmers could advance against other farmers that existed at much lower population densities, as happened in parts North America during the European colonization, or they could fail to

advance against foragers that lived at relatively high densities or in areas marginal to the existing farming technologies. What mattered most were the relative population densities. If the colonizing farmers existed at much higher densities than the previous occupants there was little that could stop them. Even if the locals learned to coexist with the immigrants, their much lower numbers would usually ensure that they gradually disappeared as a separate group. Significantly, this would also mean the disappearance of their language in most cases.

The conditions of these emerging settler societies produced egalitarian tendencies. If most people can secure land for themselves without much trouble then they have no need to plead for such privilege to a social elite. Since the social elite cannot control the land, it has little chance of dominating other aspects of society or indeed of imposing dues or services on the common people. The result is always a considerable decline of old social elites or even their total disappearance. In political terms this can be described as *democratization* and means that common people gain a considerable, even total influence over communal decision-making.

Egalitarian settlers need to cooperate for defence and this usually takes the form of popular armies. Stratified societies normally depend on elite armies, either professional standing forces or the social elite doubles as a military elite, as did the knights of medieval Europe. Such forces are small compared to the population in general so that when an egalitarian settler society emerges from such roots and creates a popular army where most men are expected to participate in defence, it amounts to a militarization process. A far larger proportion of the population is mobilized in war, which greatly increases the military power of this society.

A settler society that is both democratized and militarized has a strong impetus for expansion, not only to occupy empty lands but also to conquer lands by force. Free from the control of an effective social elite, the democratized populace constantly demands more land for itself in order to be able to live decently and procreate, and militarization provides the force that allows such expansion. Even if a colonizing expansion starts off as

simply settling on empty or near empty lands it soon develops the need and the means to continue this expansion into lands already occupied by others. In this way, the expansion feeds on its own success and continues as long as there is any land that can by settled or conquered.

The second variation of expansion cycles I have called *system expansion*. Once under way, it usually behaves quite similarly to colonizing expansion and feeds on its own success in exactly the same way. The difference is that it doesn't need empty lands to get started. Instead, system expansions have their origins in *competitive systems*. These are cultures that show significant levels of conformity and usually, though not always, share a single language. However, they are politically divided which leads to constant and escalating competition between the polities. The concept of competitive systems is well known under the guise of *state systems* although I extend it to include state-less societies; hence the change in terminology. Many archaeologists also discuss what they call *peer polity interaction*, which is a somewhat similar idea (see Renfrew & Cherry (eds.) 1986).

The competition in such systems impels the polities to constantly seek ways to maximize their military power, e.g. through developing new and effective weapons or tactics but ultimately also by including more people in the business of war. Even if these societies were originally based on social stratification and had elite armies they will sooner or later be forced to mobilize the common people in their conflicts. With such militarization comes democratization since the elite cannot effectively subdue or control a populace that is armed and seasoned in war (see Andreski 1954/1968). The common people in such societies are normally a farming population and their greatest political demand is usually the demand for land. This demand has to be accommodated if at all possible and at first this is perhaps done by intensifying land use in the homeland leading to population growth and increased pressure on the land. Such pressure seeks an outlet and luckily, the militarization process has created the means to acquire new land by force. New land relieves the pressure in the short run but, in the long run, stimulates population

growth that demands still more land and so increases the total pressure. As the expansion begins, it is usually directed away from the system since most of the polities of the system are similar and not easy prey. Only polities that have not benefitted from the competition and the militarization of the system can easily be overrun. From here on, the system expansion proceeds more or less as a colonizing expansion would; it feeds on its own success and continues to expand until something stops it, whether it is geography or an enemy that can't be overrun. In most cases the expansion cycle takes about two centuries to run its course.

Once the expansion stops, *elitization* gradually takes over. When the warrior-farmer finds that expansive opportunities have disappeared he quickly reaches the conclusion that there is no point in continued belligerence. The popular army then disbands itself and refuses to fight except in its own defence. Gradually it withers away as it falls into disuse. At the same time, the renewed scarcity of land stimulates the growth of a social elite and soon a new elite army replaces the popular army. Thus things return to 'normal'.

There are many examples of expansion cycles in European history but the most relevant for us are those that have produced large-scale barbarian migrations resulting in significant linguistic shifts, especially those of the Gauls, Germanic peoples and Slavs. For lack of good narrative sources, these expansions are generally less well known than the 'civilized' expansions of the modern Europeans, Archaic Greeks or even the Etruscans.

Of the three major barbarian expansions, the Gallic one (ca. 5th to 3rd centuries BC) is the least well documented. The Mediterranean civilizations report numerous attacks by the Gauls but they have little to say about what was happening at the core of the expansion. Therefore, we have to rely on archaeology to get a glimpse of what was going on but such evidence is often difficult to interpret, especially when it comes to political organization and conflict. Suffice it to say that the archaeological evidence appears easily compatible with the hypothesis that a competitive system existed among the early Gauls and that this produced a system expansion as described

above (see Kristinsson 2010: 91-100).

Germanic expansion seems to have been a complicated affair that progressed in three stages or waves (ca. 3rd century BC to 6th century AD), each with its own characteristics. However, several aspects of the Germanic system and expansion are relatively well documented thanks especially to Tacitus' description from the late 1st century AD. There is little doubt that the Germanic tribes constituted a competitive system and Tacitus describes this in detail. Also well known is the egalitarian and militarized nature of early Germanic society that, however, after each expansive wave showed a tendency to revert to a more stratified organization (Kristinsson 2010: 141-182).

I was unable to find any indication of a competitive system at the roots of the Slavic expansion (ca. 5th to 7th centuries AD or later). Of course, it didn't help that their original homeland is not known with any certainty. And yet, the migrating Slavs seem fully militarized and even more egalitarian than the Germanic tribes. It may be suggested that the solution to this puzzle is that the Slavic expansion started as a colonizing expansion, triggered by the Germanic exodus from large parts of east-central Europe in the 5th century AD. This would have left behind a cultured landscape, easily reoccupied and the Slavs were well placed to take advantage. The colonization movement would have resulted in profound social changes, producing egalitarian and militarized tribes, some of which soon turned to attack the Eastern Roman Empire (Kristinsson 2010: 192-197).

As the mechanism that drives both types of expansion is basically the same, they seamlessly blend into each other when the occasion arises. The Slavs may have set out on a colonizing expansion but nevertheless they turned to conquer lands from the Romans. The Viking expansion started as a system expansion but when it reached empty Iceland it turned to colonization. This is important to keep in mind as there are indications that early IE expansions may have shown characteristics of both types (below).

The above description applies to historical expansion cycles occurring in agricultural societies and there is no guarantee that prehistoric ones may not deviate to some extent for example because elite warfare hardly existed

before ca 2000 BC or that colonizing the steppe may naturally lead to a tendency towards more hierarchical societies. However, it seems quite likely that the basic mechanism would be similar.

While researching expansion cycles I realized that they might have a bearing on the IE question, something I have been interested in practically all my life, since here was a mechanism that could explain how and why agrarian populations expanded, thereby also explaining how and why certain language families could become widespread.

The Cucuteni-Tripolye Culture

One of the most remarkable cultures of prehistoric Europe was the Cucuteni-Tripolye (CT) culture.[5] It emerged in the late 6th millennium BC in the eastern foothills of the Carpathian Mountains in modern Romania and, over time, expanded across the forest-steppe through Moldova and the Ukraine towards the area around the modern city of Kiev. This Neolithic culture evolved copper metallurgy and thus became what archaeologists term Chalcolithic (or Eneolithic) and showed characteristic patterns in its settlement types and artefacts making it easily recognizable and distinct from all its neighbours. The CT culture is perhaps best known for its 'super-villages' that emerged in the first half of the 4th millennium BC, some of which may have held a population in excess of 10,000 people, considerably more than most early cities. Archaeologists usually refrain from calling them cities because they appear to lack signs of social or economic diversity, being made up of a large number of similar houses (Kohl 2002: 153-155). Nevertheless the CT culture obviously held a very large population for its time and may very well have supported the highest population densities anywhere in Europe, encouraged by the fertile soil and

[5]Romanian archaeologists gave the name Cucuteni to this culture from a site in Romania while Russians gave it the name Tripolye from a site in the Ukraine. It was only later realized that the two cultures were one and the same. To complicate matters further, the *Ukrainian* name for Tripolye (which is Russian) is Trypillia and more complications stem from the different ways of translitering the Cyrillic Alphabet (used by both Russian and Ukrainian) into the Latin alphabet. I find it convenient to simplify matters by using the 'CT' abbreviation.

generally favorable conditions of the forest-steppe for the agricultural practices of the time. This was a long-lived culture but in the latter half of the 4th millennium BC it started to break up and transform itself into regional variants to finally disappear as such in the early 3rd millennium BC (for the Cucuteni-Tripolye culture in general see Zbenovich 1996; Anthony 2007: 164-174, 230-239, 277-282, 343-348; Kohl 2002: 153-157; Mallory 1989: 195-197, 235-238; Whittle 1996: 78-79; Manzura 2005; *EIEC*, "Tripolye Culture": 602-604; Parpola 2008; Dergachev 2000).

The CT culture is important to IE studies because of its position on the border between the steppe and the woodlands. The two most prominent solutions to the IE homeland problem, the Kurgan hypothesis and the Neolithic hypothesis, both share a common problem: how to get the Indo-Europeans across the steppe border (cf. Mallory 1997: 114-16). The former wants to move them westwards and the latter eastwards but both of them have to somehow construct a believable scenario that would account for the presence of IE populations on both sides of the border no later than at the beginning of the 3rd millennium BC. Two prominent archaeological cultures, one on each side of the border, emerged around 3000 BC and they simply have to have included IE speaking populations, it being impossible to account for the later distribution of IE languages in any other way (e.g. Darden 2001: 212). These cultures were the Yamna culture on the steppe side, emerging in the late 4th millennium and the Corded Ware culture on the woodland side that emerged around 3000 BC. Both of these cultures became very extensive and thus seem well fitted as cultures of expanding IE populations. The problem, however, is that they don't appear very similar and it is quite difficult to derive one from the other.

For many scholars, the solution to this dilemma is to use the CT culture as a kind of intermediary. Those favouring the Kurgan hypothesis tend to see IE speaking Yamna or other steppe populations infiltrating and dominating the CT culture, the IE dialects spreading from there over much of central, northern and eastern Europe (Anthony 2007: 349-360, 367-370; Anthony 2008).

Conversely, those who think that IE languages had been present in Europe since early farming often see the CT culture as one of a number of European cultures already speaking different IE languages. These people then started to colonize the steppe in the 4th millennium BC, thus bringing IE languages to this new environment where they are well documented in later times (Renfrew 1987/1989: 97, 161, 197-205; Renfrew 1999: 275-276, 280).

I used to think that of these two hypotheses, the Neolithic one was less bad. There certainly were some problems with it and one of them was how to get the IE farmers to the steppe. Most respected authorities had claimed that there was no archaeological evidence that showed CT populations colonizing the steppe and it was my searching for an alternative view that brought to my attention a paper by Igor Manzura, called 'Steps to the steppe' (Manzura: 2005). Manzura doesn't mention Indo-Europeans but concentrates on the relationship between the CT culture and the colonization of the high steppe.

Unlike the river valleys that traverse the steppe, the high steppe between these valleys was a difficult place to settle. It was an arid environment and grazing was limited and seasonal. Therefore, it was not suited for the settled agricultural practices that had evolved in Europe. The key to colonizing this vast land of open spaces was mobility. Only by moving around, as the grazing was locally depleted, was it possible to make a living in this place. However, once mastered, this environment promised great opportunities for population growth and expansion. Manzura convincingly showed how the massive population of the CT culture, as it tried to find an outlet, may have played a decisive role in the colonization of the high steppe that eventually succeeded in the 4th millennium BC (somewhat similar ideas had been expressed earlier at least by Rassamakin 1999 and Kohl 2002: 157-163; see also Kohl 2007: 126-144). Other populations were certainly also involved but in light of Manzura's theory, it seemed quite reasonable that the language of the CT culture could become dominant within the Yamna culture, although Manzura doesn't discuss this.

Manzura's discussion suggested to me that the CT

culture had gone through at least two expansion cycles of the kind I had been investigating; the first at the transition from the Early Copper Age to the Late Copper Age, towards the end of the 5th millennium BC, and the second at the transition from the Late Copper Ager to the Early Bronze Ager in the mid 4th millennium. I gradually came to the conclusion that these CT expansion cycles made the Neolithic hypothesis superfluous, along with its chronological problems. A far simpler and less problematic solution was to place the IE homeland in the CT culture, pure and simple.[6]

This simplifies the spread of IE languages as compared to the Neolithic and the Kurgan hypotheses. Since both of them often use the CT culture as an intermediary between the woodland and the steppe cultures, it seems far less complicated to derive both cultures from this border zone. According to this scenario, both the Yamna and the Corded Ware cultures were significantly derived from the CT culture although both would also have incorporated local elements and developed through certain cultural transformations (below). Both represent expansion from the CT core but this expansion took on different characteristics according to the environment they utilized; in the steppe zone it became the Yamna culture but in the forest zone it became the Corded Ware culture. The border between them follows the ecological border quite closely. Despite mixing with indigenous people, the CT population in both of these zones would have been strong enough to make their IE language prevail in the long run.

Later in this article, I shall take a closer look at the CT expansion cycles and the sequence of events that may have caused the language of the CT culture to give rise to various IE subfamilies. But first we must ascertain how this

[6]Although I am probably not the first to think of placing the PIE homeland in the CT culture, I am not familiar with any previous theory to this effect. However, J.P. Mallory has used the CT culture as a hypothetical homeland in a methodological discussion (Mallory 1997: 102). I have no idea whether his choice of the CT culture was random or not. Parpola argues for including the (late) Tripolye culture as well as the steppe in the IE homeland but inexplicably shies away from the conclusion of equating the CT culture with the IE homeland even if it seems rather obvious based on his body of evidence (Parpola 2008).

hypothesis actually fits the evidence as it stands.

The Evidence

The Evidence for the CT culture all derives from archaeology. Therefore, in assessing how it fits as the IE homeland we must compare the archaeological evidence for this culture to other evidence that is relevant to the homeland problem. This evidence can be roughly divided into three categories: historical linguistics, genetics and comparative mythology.

The first of these is by far the most important for the obvious reason that the primary evidence of prehistoric language distribution is always the language itself. First there is the distribution pattern to consider. When seeking the origins of evolutionary phenomena it is often assumed that the centre of gravity, in this case meaning the zone of greatest diversity, indicates place of origin. The older the distribution of the phenomenon the greater diversity we should expect and progressively less diversity the further we go from the source (see Mallory 1989: 152-153 and Mallory 1997: 95-7). While this method is far from foolproof it is often used, e.g. in biology, to hint at where a species or a group of related species originally came from. For example, in the human species the greatest genetic diversity is found in Africa supporting the 'out of Africa' hypothesis for early human dispersal. It has long been recognized that the centre of gravity for the IE languages lies somewhere east of the Rhine and west of the Anatolian Plateau, south of the Baltic and north of the Mediterranean. Of the twelve IE subfamilies that contain well documented languages, eight have early historical attestation in this area: Greek, Italic, Celtic, Baltic, Slavic, Germanic, Albanian and Anatolian. One more, Iranian, should perhaps also be included here although it also extended far into Asia. The rest, Armenian, Tocharian and Indo-Aryan, along with Iranian, are scattered over the western, central and southern parts of Asia. If we include some poorly documented and extinct IE languages (Illyric, Thracian, Dacian, Phrygian, Venedic etc.) it is specifically SE-Europe that becomes the centre of gravity. For what it's worth, the CT hypothesis conforms very well with this line of argument although this doesn't really constitute proof.

Most historical linguists agree that, based on the lexical items reconstructable to IE, the time these languages started to diverge should be around the 4th millennium BC (Gamkrelidze & Ivanov 1984/1995; 761-762; Mallory 1997: 99-101). This is based on the level of difference between early IE languages but also on lexical evidence e.g. for the wheel (above), copper metallurgy (rather than bronze) or certain farming technologies. Again, this fits the CT culture very nicely with the first expansion starting in the late 5th millennium BC and the second, more important one, taking place in the mid 4th millennium. The first of these two expansions could, in fact, match the proposed early separation of the Anatolian languages (including Hittite), which most scholars see as an outlier in the IE family, some proposing an early separation between Anatolian and all the rest – the Indo-Hittite hypothesis (see Darden 2001: 185-186). It turns out that the usual IE words referring to wheels aren't really present in Anatolian languages, suggesting that this group may have separated before this technology fully emerged, which was probably no earlier than the first half of the 4th millennium (as demonstrated by Darden 2001: 204-209; cf. Gamkrelidze & Ivanov 1995: 621-623). If Anatolian separated in the first CT expansion (perhaps around 4100 BC) and other IE dialects started to spread out in the second expansion (ca. 3500 BC), it all fits very well indeed.

Much has been written and said about the lexical evidence concerning the physical environment of the IE homeland but there is little agreement. A great impediment to the effective identification of environmental items is the fact that the meaning of such terms tend to change over time and as populations enter new environments. Therefore, it can be extremely difficult to know the exact original meaning of a reconstructed word (for further discussions of such problems see e.g. Darden 2001: 186-187 and Renfrew 1987/1989: 77-86). It should be noted that most efforts to use this method to define a plausible area in which the IE homeland should be located, include the location of the CT culture (e.g. Renfrew 1987/1989: 79 [Fig. 4.1 (*after Mann and Kilian*)]; Mallory 1989: 158-164). However, there is just one reasonably clear conclusion from this method: The IE

homeland was located somewhere in the western part of temperate Eurasia although not on the Atlantic seaboard (no surprise here).

The subsistence technology of the PIE population, judging from its lexicon, was that of Copper Age farmers, typical of much of Europe and western Asia (for an overview of this lexicon, see Gamkrelidze & Ivanov 1984/1995: 593-641). There is no indication of a nomadic lifestyle and considerable evidence to the contrary. Domestic pigs were almost certainly present, unsuitable for nomadism, bees were possibly kept, also unsuitable, and there are several terms that relate to houses or settlements that seem to be permanent (Gamkrelidze & Ivanov 1984/1995: 508-513, 516-524, 645-649; Mallory & Adams 2006: 153, 219-228, 262-263). This might be a problem for the Kurgan hypothesis, except that, prior to the colonization of the high steppe (below), many of the people residing in S-Russia actually practiced a sedentary agricultural or semi-agricultural lifestyle in the river valleys that traverse the region (Mallory 1989: 197-210; Anthony 2007: 174-192). The horse was known to PIE speakers but we have no way of knowing whether it had been domesticated or not. The CT culture would have known wild horses and domestic ones were probably appearing in the region as it started to expand so there is no problem here (Anthony 2007: 197-199; see also Parpola 2008: 27-30). It should be strongly emphasised that, contrary to a widely held misconception, there is absolutely no indication in the PIE vocabulary that the horse was of any special importance. The idea that PIE culture was a horse-culture is entirely the product of comparative mythology (below).

Taken together, the evidence for material culture seems to fit best with a classic sedentary farming culture like the CT culture, rather than a semi-nomadic culture we would expect on the steppe although the evidence cannot be claimed to be conclusive.

Most of the archaeological evidence for the CT culture comes from settlement remains rather than from human burials, which provide most of the evidence for some other cultures. It is, in fact, one of the mysteries of the CT culture that we have no idea what these people

normally did with their dead. Cemeteries have only been found in some regional groups in the late and final periods, as the CT culture started dissolving after the 2nd expansion, and then burial customs differed markedly (Zbenovich 1996: 209-210; Manzura 2005: 320; Anthony 2007: 267-270, 264, 277). This may indicate that burying people in the ground was a newly introduced practice. Previously the dead may have been cremated and the ashes scattered in fields or they may have been exposed to the elements and scavengers as in 'sky burials'. It is rather interesting that PIE terms that relate to burial of the dead are practically nonexistent (*EIEC*, "Death Beliefs": 151-153).[7] While such negative evidence should not be overemphasized it would certainly be a problem for the CT hypothesis if PIE contained terms e.g. for burial mounds, the signature monuments of 'Kurgan' culture. For what it is worth, the lack of such terms favours the CT over the Kurgan hypothesis.

The second kind of evidence that has a bearing on the issue is genetic. In interpreting genetic evidence we should be acutely aware that languages are cultural phenomena and these can be transmitted differently from genes – not only to direct descendants but also to alien populations. Even more relevant is the fact that when populations mix and blend their genes, only one language survives but this language does not accurately indicate the genetic heritage of the resulting population. Therefore, we should not expect any close correlation between the linguistic and genetic inheritance. However, genetic research can give us an indication of ancient population movements and thus be relevant to reconstructing such movements that resulted in language displacement.

The genetic marker that has most often been mentioned in relation to the IE question is a version of the Y chromosome, usually transmitted unchanged in direct line from father to son. Rare mutations to this chromosome produce different variations or *haplotypes* and

[7]Gamkrelidze & Ivanov's reconstruction of IE burial rites (1995, pp. 725-30) is based only on comparative mythology, not on comparative linguistics and, therefore, highly questionable (Gamkrelidze & Ivanov 1984/1995: 725-30).

by mapping the distribution of such haplotypes we can see how the originator's descendents have dispersed. A haplotype that seems relevant to IE distribution is called *R1a1* and it shows a marked concentration in two regions: eastern Europe and a zone stretching from the southern part of central Asia to the northern part of the Indian subcontinent (e.g. Keyser *et al.* 2009; Klyosov 2009). Presumably this haplotype was common among the PIE speaking population or some part of it and therefore shows where this population dispersed to. Actually, this evidence isn't as helpful as one might think because it is easily compatible with both the Kurgan and the CT hypotheses, perhaps also with the Neolithic hypothesis although less obviously so. The Armenian theory, on the other hand, gets no support here and would have to explain this peculiar distribution as unrelated to IE expansion; and perhaps it is mostly unrelated as seems to be indicated by some recent research (Sengupta *et al.* 2005; Underhill *et al.* 2009).

Finally we have the evidence from comparative mythology where some scholars attempt, rather like in comparative linguistics, to reconstruct ancient mythology from the mythologies of much later populations. It is assumed that these populations are related in some sense and that the relevant mythologies have been passed down from their common ancestors. In the IE case the relationship is defined by their linguistic similarities and a comparative mythologist investigates the known mythologies of various IE populations to arrive at some common core that he or she then assumes stems from the mythology of the Proto-Indo-Europeans.

As a reconstructive tool comparative mythology is nowhere near as reliable as comparative linguistics and the reasons are fairly obvious. Although we can assume that some items of mythology have been inherited from PIE speaking populations to various IE speaking descendants it is extremely difficult to identify such items after thousands of years of separate development. During this time these populations have undergone various convulsions that have necessarily affected their ideologies, they have interacted with non-IE populations and may have borrowed ideas from them as well as from other IE populations at different

times. Whereas comparative linguistics have good methods for detecting borrowed items, it is hard to be certain that a particular item of ideology is derived from the PIE speaking population rather than from somewhere else. Such items probably exist but the trick is to identify them and this is where comparative mythology runs into difficulties. It is quite certain that many comparative mythologists have been far too reckless in assigning PIE status to ideologies that happen to be found among some IE populations.

An example would be Dumézil's famous trifunctional system where a PIE caste system or at least a trifunctional pattern of thought is 'reconstructed' based on the social system or ideologies of some IE groups of much later periods. The methodology here is very questionable as one cannot help thinking that the social and ideological situation of various IE societies of the 2nd millennium and later had more to do with contemporary circumstances than with the beliefs and social realities of the Proto-Indo-Europeans, thousands of years earlier (for a level-headed criticism of trifunctional ideology as reconstructable to PIE society, see Grottanelli 1996). One also has to question how specific to Indo-Europeans such ideologies were, as they seem to be obvious elements of generic elite ideology. One of the three functions, the warrior function, probably didn't even exist until around 2000 BC with the development of elite warfare. From that point on it would have been present in some form in practically all societies that had embraced elite warfare – Indo-European or not. None of this matters much in the current discussion since the trifunctional system has limited relevance to the homeland problem – partly, it's true, because of its controversial nature.

Another common reconstruction is that of PIE culture as a 'horse-culture'. This one is more relevant to the homeland problem because if true, it would lend support to the Kurgan hypothesis. The methodology here is similar to the trifunctional hypothesis and the problems are also similar. This reconstruction is based on selective evidence from certain historical IE cultures from a much later date and there is no way of knowing whether these ideologies actually reflect PIE society or some later trends, developments or fashions (for an example of such

reconstruction see Gamkrelidze & Ivanov 1984/1995: 463-80). Certainly, the earliest documented IE cultures, the Hittites, Mycenaean Greeks, Indo-Aryans and Iranians, all had a special place for the horse in their cultures but this is only because *at that time,* in the 2nd millennium BC, the horse was important to ruling elites as it pulled the war chariots that were their primary instruments of war or carried the cavalry that was emerging among the nomads at the end of the millennium. Elites and nomads of the 2nd millennium BC certainly did revere the horse, and for very good reasons, but this doesn't mean that their PIE predecessors, 2000 years earlier, did so as well. This would be similar to maintaining that because all modern IE cultures use motorcars PIE culture must have used them also. Just as the motorcar belongs to the last hundred years or so, these 'horse-cultures' firmly belong to the 2nd millennium BC and later times and simply have nothing to do with PIE culture of the 4th millennium BC.

From the 2nd millennium onwards, horses have often been important to elites since, unlike commoners, they had a tendency to fight in chariots or on horseback. Therefore the horse set them apart and was central to their identity. Just think of the medieval knight in Europe and how the knightly class defined itself as a mounted military force. It is hardly surprising that cultures that were at some time ruled by mounted elites show some signs of horse reverence and, as elements of elite culture, these were readily borrowed between them. Even though the IE peoples no longer spoke the same language and linguistic influence had largely ceased to pass between them, they were still in contact and profoundly affected each other culturally.

Altaic speakers and other peoples of eastern Asia preserved mythologies and rituals, related to the horse, that are quite similar to those of some IE groups. It is naturally assumed that these must have been borrowed from their IE neighbours (Gamkrelidze & Ivanov 1984/1995: 479-480). But if Altaic speakers could borrow these myths it also means that IE speakers themselves could have borrowed them, either from each other, long after their expansion began, or from some external source. Reconstructing them as PIE myths is just one possibility

and certainly not the most reasonable one. It bears repeating at this point that comparative *linguistics* has produced absolutely nothing that indicates a special place for the horse in PIE culture. There was a word for horse and that is all we know. Everything else is fantasy.

Not all mythologists are this reckless in reconstructing PIE society and myth through questionable methodology. A fine example is M.L. West's recent study of IE poetry and myth where he dismisses Dumézil's trifunctional model (West 2007: 4). He is acutely aware of the methodological problems, considers them intelligently and realizes that just because a mythological item can be found in various IE cultures (and is in this sense IE), this does not necessarily mean that it can be traced back to PIE culture (West 2007: 19-25). There are some ideas and myths that seem to be genuinely PIE in origin and West discusses some of them although, since they have little bearing on IE homeland problem, there is no need to repeat his discussion here.

The central notion of reconstructive mythology, that one can trace mythological elements in the same way one can trace linguistic ones, needs to be treated very sceptically. This applies doubly for elite mythology because elite culture usually is far more cosmopolitan and open to foreign influence than the culture of the common people (see e.g. Kristiansen & Larsson 2005: 141-250). Horse reverence and the trifunctional system, the two important components of 'reconstructed' PIE mythology mentioned above, are both typical elite ideologies and have almost certainly spread between various elites, some speaking IE languages – others not, long after the PIE community ceased to exist. Comparative mythology can neither rely on a primarily genetic transmission, as linguistics can, nor has it any reliable way to detect borrowings and must therefore be used very carefully.[8]

In conclusion, it seems that there are no problems in reconciling the CT hypothesis with current evidence for IE

[8]See also Renfrew's criticism of reconstructive mythology (Renfrew 1987/1989: 250-262). Mallory gives a good overview of the subject with a healthy dose of scepticism (Mallory 1989: 128-142). Some respected authorities are sadly uncritical, such as Anthony (2007: e.g. 92) or Gamkrelidze & Ivanov (1995: 464-474 and *passim*).

history and it seems to be an easier fit than either of the two prevailing hypotheses. The only exceptions are claims made by some comparative mythologists but their problematic methodology makes this a moot point.

In the remainder of this article I shall try to recreate the origins and early expansion of IE speaking populations according to the current hypothesis.

The Beginning

The CT culture was formed in the late 6th millennium BC under influences from several directions. Indigenous to the region was the Bug-Dniester culture of hunter-gatherers that gradually adopted more and more elements of farming. This disappeared when strong influence came from the northwest, ultimately originating in the Carpathian Basin as an offshoot from a variant of the Linear Pottery culture, the first farming culture in central Europe. This may have provided much of the population in early CT but there were also strong influences from some Balkan cultures (Anthony (986: 292-293; Anthony 2007: 165-174; Mallory 1989: 196-197; Whittle 1996: 85-86, 131-132). Of course we don't know where the language (or languages) of the early CT culture came from but the Linear Pottery connection is perhaps the most significant source although this is by no means certain.

PIE shows affinities with some other language families, the least disputed of these are Uralic (especially its Finno-Ugric branch), Semitic and Kartvelian families. In most cases there is simply evidence for the exchange of loanwords or borrowing from a common source. In the case of Uralic there seems to be some evidence for a genetic relationship as well; PIE and Proto-Uralic (and/or Proto-Finno-Ugric) not only exchanged words but also actually had a remote common ancestor (see Helimski 2001; cf. Koivulehto 2001). The Uralic family seems to have originated somewhere in western Siberia or eastern Europe and such a relationship with the population of the CT culture is entirely possible even if there is some distance between the CT culture and the location of surviving Uralic languages. We should keep in mind that the IE expansion itself must have eradicated many languages as it progressed and many of these may have been related to

PIE or Proto-Uralic or both. Precisely because the IE languages expanded, we should not expect to be able to find old indigenous non-IE languages surviving close to the IE homeland – they have all disappeared.

The Kartvelian languages that still survive in the Caucasus also seem to have had contact with PIE. Gamkrelidze's and Ivanov's Armenian theory rests largely on a proposed relationships with Kartvelian and Semitic which leads them to seek the IE homeland close to the historical speakers of these languages (Gamkrelidze & Ivanov 1984/1995: 768-785; see also a critique in D'iakonov 1985: 115-140).[9] Anthony, on the other hand, uses the same kind of argument to place the homeland between the Proto-Uralic and Proto-Kartvelian languages, because PIE shows connections to both (Anthony 2007: 98; see also Mallory 1997: 97-98 for a critical view of such methods).

The logic here is quite questionable since there simply aren't any old languages, other than IE ones, that have survived to be recorded in some of the areas surrounding the Black Sea. For the languages that have survived in the region, we can usually or always find some linguists that will argue for a relationship between them and PIE. The languages that have disappeared would probably have had such relationships as well but they cannot enter the argument because they are lost (cf. D'iakonov 1985: 141). Therefore, it makes little sense to pinpoint the IE homeland close to the location of the few languages that managed to survive IE expansion. Precisely because of the IE expansion, we should not expect many, or even any, of their closest neighbouring languages to have survived. It is only at some distance from the centre of expansion that we can expect to find such survivors, which means that PIE is neither likely to have been spoken in the area in-between Uralic and Kartvelian, as they are known in historical times, nor between Kartvelian and Semitic.[10]

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[9]Doglopolsky uses essentially the same argument for an Anatolian homeland (Doglopolsky 1988).

[10]Cf. Mallory's argument: "It is less likely (although not entirely impossible) that the IE homeland was situated within a territory occupied

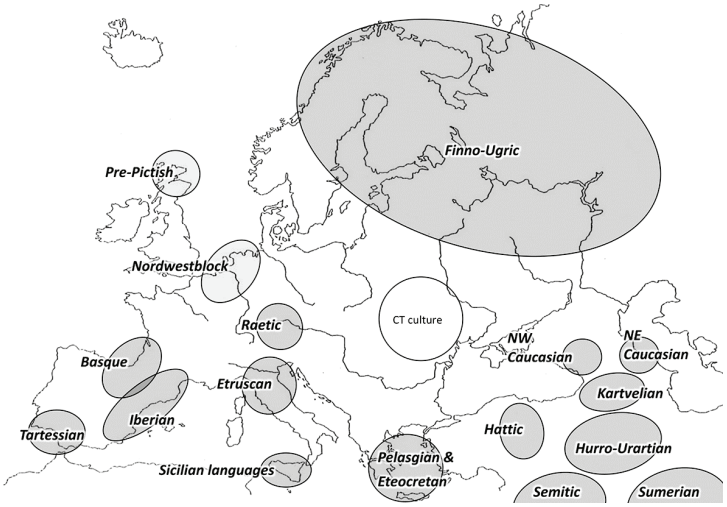

Figure 1. Distribution of indigenous non-IE language families. The two NW-European groups (in lighter shade) are uncertain but IE origins are, for other reasons, unlikely in W-Europe. A few scholars hold that Tartessian may have been IE (esp. Celtic). Raetic was probably related to Etruscan (although a minority proposes IE roots). In Sicily, the Sicels spoke an IE language but the Elymi and Sicani probably did not. It is often suggested that at least some Pelasgian languages may have been IE but most scholars agree that Eteocretan (in Crete) was not.

We can actually reverse this argument to help us locate the likely centre of the original IE expansion. Because IE expansion presumably eradicated all of its closest neighbouring languages early on, the location of the survivors should be as far away as possible from the center of expansion. In other words, we can look for the largest area in western Eurasia with no known indigenous non-IE languages and the middle of this area should be a prime candidate for the center of IE expansion. As shown on Figure 1, there is a large area without indigenous non-IE languages in east-central to southeast Europe. Its core lies at the NW corner of the Black Sea, somewhere

by non-IE languages at the time of the earliest written records" (Mallory 1997: 104).

between the Danube and the Dnieper. At the time when IE expansion began (ca. 4th millennium BC) much of this core was occupied by the CT culture.

There is a danger inherent in using the Kartvelian connection to locate PIE because of the extremely limited distribution of this language family in historical times. The modern distribution may not reflect the distribution of these languages in the 4th millennium BC and the distribution of Kartvelian, because of IE expansion (or for other reasons), may have shrunk or shifted considerably. According to the CT hypothesis the Anatolian languages entered Anatolia from the west in the 4th or 3rd millennium BC and they must have replaced earlier, unknown languages. Some of these may very well have been similar to Kartvelian. In fact, immigrants from Anatolia brought agriculture to Europe and some of them may have spoken languages related to Kartvelian and Afro-Asiatic ones (close to Semitic). The early CT culture may very well have been influenced by Kartvelian and Afro-Asiatic speaking cultures in the Balkans as well as maintaining contact and exchanging words with such cultures elsewhere throughout its lifetime.[11] The CT culture was not some tiny isolationist pocket – it was one of the most populous, dynamic and cosmopolitan cultures of its time.

These Asian influences may have entered Pre-Proto-Indo-European long before its 'proto' stage (immediately before division). Some of the elements that took part in the formation of the CT culture may have brought such influences along. It is even possible that a remote genetic ancestor of PIE was originally brought over from Anatolia to Europe by the first farmers although a genetic relationship with Uralic, if real, would seem to argue against it.

One more thing needs to be mentioned regarding PIE loanwords e.g. in Finno-Ugric. The presence of such words does not necessarily mean that the PIE homeland was located close to the speakers of the adopting language. Once more we must remind ourselves that the early Indo-Europeans expanded dramatically and thereby carried their

[11] It has been suggested that considerable interaction existed across the Black Sea at least from the beginning of the Bronze Age (Bauer 2006).

linguistic influences fare and wide. PIE influences on Finno-Ugric need not stem directly from the IE homeland but may have been brought along by early IE speaking populations that were already expanding to the north and east such as seems likely for the Fatyanovo culture (below).

It is highly unlikely that the CT culture comprised a single political unit. Many early or non-state cultures include a number of political units, tribes, clans, chiefdoms or whatever we like to call them. There are indications of conflict and war in the CT culture such as clusters of arrowheads or the construction of defensive works around some of the settlements (Anthony 2007: 230-231; Manzura 2005: 318). When confronted with such evidence, scholars all too often assume that there was some external threat coming from a different culture. This is how V. Dergachev interprets the evidence of fortifications and arrows from the CT culture claiming they support M. Gimbutas' theory of steppe invasions (Dergachev 2000). However, from the maps he produces, it seems extremely hard to read any special threat from the steppe.[12] On the other hand, the distribution of fortifications, as presented by Dergachev, correlates well with the age and density of settlements. This is not unexpected, as crowded areas would intensify competition, which accords well with my hypothesis of a competitive system in the CT culture.

Many cultures composed of several tribes or other polities experience internal strife and warfare. Therefore, evidence for war can often be explained by intra-cultural conflict rather than external threat. It seems very likely that the CT culture was such a case and that it constituted a competitive system from early times. This is precisely what may have propelled its expansions; first a gradual colonization of the forest-steppe and later, two spectacular expansion cycles.

The constant warfare must have required each polity to seek to maximize its military capacity with the participation of all able-bodied men. As a result, such warriors would necessarily have held considerable political

[12]Dergachev claims that the distribution of fortified sites "suggests an external threat" (Dergachev 2000: 281). I find this quite baffling, as I am simply unable to discern any such pattern in his maps.

power and they would constantly have sought land for themselves and their families with the result that most young people were able to marry and have children. The consequence was population growth that had to be accommodated somehow, the fertile and easily cultivable forest-steppe making such growth fairly painless to begin with.

Colonizing the forest-steppe would have maintained these egalitarian conditions since new and empty lands with ample room for new settlements also promotes egalitarianism and popular warfare. However, most good land around the settlements eventually became occupied and population pressure started to build up. In most historical societies, with limited expansive options, we would expect elitization to emerge with elite warfare, concentration of private property and the slowing down of population growth as fewer people acquired the means to support families. Whether this happened in the CT culture is uncertain. For one thing, there are little or no indications of elite warfare at this time, it only becoming noticeable around 2000 BC, so any emerging elite would have had to rely on other means to secure its position. Neither do we know how property was organized or whether it was even possible for an elite to accumulate property or control it. Therefore, the details of how CT expansion worked are somewhat uncertain but the basic mechanism is likely the same as in later expansion cycles.

The historical importance of the CT expansion cycles is that they may very well have been the first system expansions ever to occur in human history. Their effects were correspondingly massive. A greatly increased settlement density in the older, western part of the CT culture characterized the period leading up to the 1st expansion at the end of the 5th millennium BC. Settlements came to be situated in good defensive spots, artificial defences also emerged and weapon-finds increase significantly (Manzura 2005: 318; Parpola 2008: 36-38). This is exactly what we should expect as an expansion cycle is about to take off. Internal competition leads to intensified internal warfare that, through its democratizing effects, leads to population growth. The resulting expansion can be seen in the extension of the western CT

zone to the south towards the Danube but there also appears to have been a significant migration of farmers from the western part of the CT culture into its eastern half where concentration of settlements increased as it declined in the west. There is also some evidence to suggest a migration into the eastern Balkans (Manzura 2005: 318, 323).

It is perhaps significant that this was the time of catastrophic collapse of the complex cultures of southeast Europe, the only one to escape such fate being the CT culture itself. The reasons for this collapse are unknown but hypotheses range from some form of internal or system collapse to climatic variations to invasions by Kurgan peoples from the steppe. In fact, this is the time of the '1st wave' of IE invasions according to the Kurgan hypothesis (Anthony 2007: 225-230, 258-262; Whittle 1996: 122-143; Gimbutas 1979: 115-120). From the point of view of the CT hypothesis the simplest and at least partial explanation is that this was a period of barbarian migrations coming out of the CT culture and quite similar to those of the Gauls, Germans and Slavs of later periods. It may very well have been the first barbarian migration of this kind to occur in history. Such migrations could cause massive destruction, would disrupt any society in its path and deposit new people in the Balkans. Most probably these people spoke IE dialects that later developed into Anatolian languages as they moved on into Asia. There is considerable linguistic evidence to indicate that the Anatolian branch was the first to separate from the IE core (above).

At the same time, a new cultural horizon was emerging in northern Europe. This was the Funnelbeaker culture (TRB culture – from around 4000 BC), the first farming culture of the north. Whether its formation had anything to do with the 1st CT expansion is uncertain but the correlation in time is interesting. As a whole the Funnelbeaker culture was almost certainly not IE as there is ample evidence of development from local roots. The Funnelbeaker culture probably represents several local cultures, of both hunter-gatherers and early farmers that developed some cultural conformity as farming was spreading (for the formation of the Funnelbeaker culture, see Zvelebil 2005). However, it seems possible that some

of the stimulant for this new conformity, a trickle of immigrating farmers, came from the CT culture as a part of the 1st CT expansion.

Like most Neolithic cultures the Funnelbeaker culture is defined by its pottery. However, if we look at the lithic industry (stone tools) instead, a different picture emerges where a large part of Poland shows distinct affinities to the CT culture, starting in the mid 5th millennium BC (Nowak 2006: 151, 149, fig. 12). Some Funnelbeaker populations, especially those in Poland, bordering the CT culture, may have spoken IE dialects onwards from the late 5th millennium BC. From about 4000 BC, IE speakers would still have been concentrated in the CT culture but some of them had already moved into the Balkans; perhaps there was also a smattering on the North European Plain and even on the steppes (cf. Manzura 2005: 318).

After perhaps a couple of centuries the 1st expansion spent itself, leaving the western CT culture with a reduced population. But population growth soon picked up again in both east and west. The interval between the 1st and 2nd expansions was quite similar to that which seems to have been the norm in historical times. It took approximately four centuries to create the conditions for the 2nd expansion and to build up the population pressure that was now unleashed in an even more dramatic expansion cycle.

The 2nd Expansion

Before we take a closer look at the 2nd expansion we should briefly consider the IE subfamilies since any reconstruction of the expansion must conform to and explain the known relationships between them.

As already mentioned, Anatolian seems quite separate from the rest and doesn't show close relationship to any other subfamily. Some similarities exist with Tocharian but these don't seem to reflect a special relationship but rather the archaic features of the two subfamilies that first lost contact with the rest. Tocharian, on the other hand, is not as distinct as Anatolian and a relationship with some western subfamilies, Germanic and Italic even including Celtic, Balto-Slavic or Greek, is often claimed, which is surprising given its extreme eastern location. Of these

western groups, Italic and Celtic seem close to each other and some even propose an intermediary Celto-Italic evolutionary stage, when these languages were indistinguishable. Both of them share some features with Germanic, which, in turn, has a closer connection to Baltic and Slavic. The latter two are so close to each other that an intermediary Balto-Slavic stage is generally accepted and, along with Germanic, they are often placed in a special northern IE subgrouping, sometimes also including Celtic, Italic and even Tocharian in a wider northwest group. More commonly an affinity is seen between the northern group (Balto-Slavic and Germanic) and the southeast (or central) group, which includes Iranian, Indo-Aryan, Armenian and Greek, especially between Balto-Slavic and Indo-Iranian. The latter is an intermediary stage that unites Iranian and Indo-Aryan. These two subfamilies are believed to have separated around 2000 BC. Greek and Armenian seem relatively close although some scholars see the latter as intermediary between Greek and Indo-Iranian or even closer to the latter. Despite belonging to this southeast group, Greek also has certain affinities with western languages, especially Italic and Celtic. Finally, Albanian is difficult to place because of its late documentation and much eroded original vocabulary.[13]

In general, the internal relationships between IE subfamilies accord well with their geographical distribution as they appear in historical times. It is hardly surprising that Germanic is related to Baltic, Baltic to Slavic, Celtic to Italic, Iranian to Indo-Aryan, etc. The simplest explanation for these relationships is that full language separation evolved only after each language had taken up residence in its historical location or, at least, was well on its way. This also means that the initial expansion was probably quite rapid so that the exact route taken by different dialects was, in most cases, of limited importance and significant differences between branches only evolved once the first

[13]This brief overview is based on various sources (such as Ringe *et al.* 2002; Nakhle *et al.* 2005; Mallory 1997: 103; Gamkrelidze & Ivanov 1984/1995: 325-374; Gray & Atkinson 2003). There are many controversies but the discussion above is my impression of the majority view.

burst of expansion was over. With few exceptions, there should be no need for complicated migrations to explain these relationships and the historical locations. The CT hypothesis fits well with this approach since the location of the CT culture is quite central to the historical distribution of IE languages and most subfamilies' relationships and locations fit very well. An expansion cycle at the beginning of IE expansion would also explain the rapid initial spread. Only Tocharian poses a problem, although probably not as serious as one might think (below).

There is good reason to link the 2nd CT expansion and the successful colonization of the steppe to the 'Secondary Products Revolution' proposed by A. Sherratt (Sherratt 1981/1997; Sherratt 1983/1997). In or around the 4th millennium BC a series of innovations boosted the productivity of farming in Europe and western Asia. Much of this had to do with utilizing farm animals in new and different ways, their previous use having been mostly confined to processing their carcasses. Now oxen were used for traction, milk was increasingly used for food and a new breed of wool-bearing sheep appeared, to name a few of these innovations. Some of these products, like milk, had been known before but apparently their importance and production increased dramatically at this time. The Secondary Products Revolution should be seen as a general innovative push in farming technologies, including also the plow, the wheel and the use of manure as fertilizer. These increased productivity of the land and thus made room for a growing population and I am certainly not the first to suggest that it had something to do with IE expansion (see Sherratt & Sherratt 1988/1997; Garrett 2006).

When new technologies emerge that increase the productivity of farmland, this is usually a clear sign of population pressure. It is only when the land fills up that people start to explore ways to accommodate the increased population by making the land produce more because this normally also means that people have to work harder for a living. When land is plentiful, life is easy. When land is scarce, life becomes harder but at least one can still support a family by working longer hours if the appropriate technology is available. Therefore, the demand for such

technologies only surfaces when the population grows (Boserup 1965/1993; cf. Manzura 2005: 327). It is a very reasonable suggestion that the Secondary Products Revolution was a response to population pressure; that people developed ways to intensify their use of the land and their livestock as the population grew beyond that which could easily be supported with traditional methods. The CT culture would have been at the forefront of these developments as one of the most heavily populated regions in the world (see Parpola 2008). It doesn't matter much where individual technologies first emerged since they were quickly adopted wherever there was need for them and CT must certainly have been an early adopter.

As we approach the middle of the 4th millennium BC we again find settlements in defensive places, some with fortifications, especially in the western half of the CT culture, which seems quite overpopulated. Again, we can assume that, through democratization, internal competition was producing a surplus population that needed an outlet. Population was also growing in the east where we now find the famous super-villages in the basin of the Southern Bug. It seems that all the best places on the forest-steppe had become densely occupied, forcing people to look elsewhere for new land (Manzura 2005: 323-327).

It was the adoption of new technologies, put to innovative new use, that allowed the overpopulated CT culture to colonize the high steppe around 3500 BC. According to such authors as Y. Rassamakin, I. Manzura and P. Kohl, the CT culture played a decisive role in this process that found a new cultural conformity with the formation of the Yamna culture from around 3300 BC (Rassamakin 1999; Manzura 2005; Kohl 2007: 23-54). When we consider the large population and expansive pressure in the CT culture, this makes perfect sense. Here was a great mass of people that desperately needed a way to make a living and when the technology emerged that allowed the colonization of a vast underutilized region, they flocked to this place, adopting any useful cultural and technological item they found on the way. By this time the two halves of the CT culture had developed some differences and it seems that the colonization of the

steppes came largely from the eastern (Tripolye) half of the CT culture whereas the western (Cucuteni) population may have taken different routes (below) (Rassamakin 1999: 112-115, 122-125). As the expansion ran its course the CT culture started to disintegrate, settlements shrank, super-villages disappeared and even the houses became smaller and simpler, all to be expected in times of migrating egalitarian farmers (see Manzura 2005: 328-334).

The key to the steppe was mobility; employing grazing animals to harvest the sparse grass where and when it became available. To maximize the use of these animals they were not only used for meat or hides but also for milk and for pulling wagons or carrying loads. The animals that grazed on the steppe thus not only provided food but also the mobility necessary for this lifestyle. The horse, possibly already domesticated to some extent by earlier steppe populations, would have been a welcome addition to this arsenal for survival and was simply adopted when it became available. The date of the first domestication of horses is central to the Kurgan hypothesis but it is not important to the current one, therefore we need not dwell on it.

In the process of colonizing the steppe the colonists transformed their way of life and their culture. We should not be surprised if the resulting Yamna culture showed marked differences from the CT culture. The expansive process itself may have loosened some cultural norms but most important is the fact that when a population crosses an environmental border and takes up a new lifestyle this frequently transforms their culture and makes them ready to adopt whatever cultural and technological item they find useful or appealing.

Similar to the Yamna adaptation to the steppe, another transformation took place in the same region around 200 AD when the Goths entered the Ukraine from their original home near the Baltic coast. The archaeological culture associated with the Goths in the Ukraine is called the Chernyakov culture and it shows only tentative similarities to the original Wielbark culture of the Goths in northern Poland. The differences are such that some archaeologists refuse to accept any connection. However, the Germanic language of the Goths clearly

indicates that they were newcomers in the Ukraine or at least enough of them to implant their language. Tacitus also firmly places them in northern Europe, only a century before the migration, not to mention the Goths' own historical traditions (Tacitus, *Germania* 44; Jordanes IV, 25-26). The disruption of the migration, the new environment and lifestyle and the contact and admixture of the local population was enough to thoroughly transform Gothic culture in their new homeland, as it appears in the archaeological record (see Heather 1996: 18-25).

Let's not forget that the archaeological record only illuminates a limited slice of material culture and many intangible elements of Gothic culture – such as belief system, language or ideology – seem to have survived relatively intact. Therefore, it appears only reasonable that when the CT population entered the steppe, mixed with the local population and adopted a whole new lifestyle, we would find a similar transformation of their material culture – a transformation that eventually emerged as the Yamna culture. It may be important to the solution to the IE problem that when people take up a new way of life, such as during the Secondary Products Revolution or when colonizing the steppe, their material culture is transformed and may become unrecognizable. In such situations we should not rely overly on being able to make connections between earlier and newer cultures.

Whatever hypothesis we prefer, it is quite obvious that early IE expansion is not clearly illuminated through the archaeology of cultures as defined by pottery types. Otherwise we wouldn't be facing all this controversy. The CT, Yamna, Corded Ware, Globular Amphora and other cultures discussed here are mainly defined by pottery and since many, perhaps all of them, must have included IE speaking populations it is obvious that the Indo-Europeans did not have a clear ceramic signature once they started to expand; from this time onwards there was no IE pottery type. This discrepancy is perhaps best explained by the fact that in most migratory movements there is a considerable surplus of males (a well documented case is that of colonists in America; see Kulikoff 2000: 62-67). Young men who emigrated without a mate would have sought

relationships with local women and half or more of the women in early immigrant groups may often have been of native origins. It has been argued that correlations between language and Y-chromosomes indicate that language replacement was often caused by a primarily male migration. The dissimilar distribution of mitochondrial DNA (transmitted only in the female line) shows that these males frequently, even usually, acquired local wives (Forster & Renfrew 2011).

As the CT expansion began, it introduced more egalitarian practises and less economic specialisation, probably doing away with most expert potters and their fineware. Since it seems that pottery, when not a specialized craft, was often the realm of women, local pottery types could therefore exert a defining influence on the resulting mix. New types would emerge that would likely be some kind of mixture of CT coarseware and local types further developed by fashion. Pottery, manufactured by women, is not a reliable indicator of predominantly male migrations. If this is what happened as the early Indo-Europeans left their homeland the variety of pottery types associated with early IE cultures isn't surprising at all.[14]

So what part of the PIE speaking population was it that colonized the steppe? The obvious answer would be the southeast group including the linguistic ancestors of the Indo-Iranians, Armenians and Greeks. The geographic location fits this group very well and we know for a fact that the Iranians were steppe dwellers and the Indo-Aryans must also have crossed the steppe. However, there is no need to assume linguistic separation although the lifestyle of the Indo-Europeans diverged. The steppe dialects would have continued to interact with other IE dialects for some time.

At the same time as the Yamna culture was forming on the steppe, or perhaps a little earlier, a new culture was emerging on the North European Plain. This was the

[14] If one could define a class of archaeological artefacts that are specific to non-elite males, their distribution could possibly give a better suggestion of this kind of migrations than the normal collection used to define cultures – often dominated by elite artefacts and/or female produced pottery.

Globular Amphora culture (from ca. 3400 BC) and it seems possible that it was influenced by elements of the 2nd CT expansion. Perhaps this was the beginning of the dialect that later evolved into Tocharian (below).

The 1st and 2nd CT expansions show characteristics of system expansions but the subsequent expansions of the Yamna and Corded Ware cultures seem substantially to have been colonizing expansions. However, these two kinds of expansions are not entirely different, in fact they behave very similarly once under way. As already described, the main difference is that one starts because of competition in a competitive system and the other because of new opportunities for colonization. In fact the 2nd CT expansion seems to be something of a hybrid. The original population pressure came from the CT competitive system, which also evolved or adopted new technologies that allowed the colonization of the steppe environment and this latter part was essentially a colonizing expansion. The new subsistence strategy provided the expanding population with vast new opportunities for colonization. However, like later colonizing expansions such as the Slavic one, this one could easily turn to conquering new lands from previous inhabitants when it ran out of empty spaces (Kristinsson 2010: 192-197).

Readers familiar with Gimbutas' theory of the three waves of Kurgan invasions will have noted that the 2nd IE expansion discussed above is quite similar to her 2nd wave of Kurgan invasions (Gimbutas 1979: 120-127). This is not surprising since there is no denying the general upheaval of these times and if people were on the move, early Indo-Europeans must have been prominent among them. The difference is that where she saw conquering horsemen from the steppe I see expanding farmers from the forest-steppe.

Expansions of Yamna and related cultures

While the colonizing of the steppe was still proceeding eastwards the people of the western steppe ran out of new land to occupy in the late 4th millennium and started to push westwards. Parts of the original CT homeland were incorporated into the Yamna region, presumably through invasion (Anthony 2007: 346-348;

Dergachev 2000: 280-281). Perhaps this was preceded by a previous out-migration but anyway, we should not assume that Yamna and late CT tribes must have been on friendly terms even if they spoke similar dialects.

From around 3100 BC, elements from the Yamna horizon started to push into the Balkans, along the Danube and into the eastern part of the Carpathian Basin (Anthony 2007: 361-364). They thus followed the same path as many later steppe invaders, sticking to an environment they were familiar with. This incursion may have prompted the Pre-Anatolian speaking population in the Balkans to start moving across the Bosporus into Anatolia. Western IE dialects, ancestral to Greek and Phrygian may have existed on the western steppe and the Yamna invasions would have carried them along the Danube as well as some eastern elements, perhaps including Pre-Armenian. Unlike later steppe invaders, who had mastered horseback warfare, these were unable to conquer and control vast territories, which means that their language had a better chance of survival since it wasn't drowned in a sea of conquered indigenous populations.

The resulting Pre-Greek speaking population of the Carpathian Basin would later come into contact with other IE speaking groups from the north, akin to Italic or Celtic with whom they may have formed a *Sprachbund* – a community where linguistic influence were readily transmitted. Or perhaps A. Garrett is right when he suggests that Greek only formed in Greece itself from a variety of different IE dialects or languages coming from the Carpathian Basin, a thousand years or more after the Balkan incursion (a model that may also apply to the formation of some other IE subgroups, see Garrett 1999 and Garrett 2006). Some of these dialects would have been of northwest origins, explaining the similarities Greek shares with Celtic and Italic.

The CT hypothesis suggests another possible explanation for the similarities between Greek and the northwest languages. All of them may originally have emerged from the same or similar dialects in the western (Cucuteni) half of the CT culture. However, Pre-Greek came under heavy eastern or steppe influence and began

to resemble the eastern dialects without totally removing its affinity with the dialects that moved north and west during the Corded Ware expansion (below). This transformation may have taken place as Pre-Greek speakers moved onto the steppe or when they were infused with a substantial steppe population. This is perhaps the most natural explanation but it would be difficult to make it fit the Kurgan hypothesis.

It is unclear by which route Armenian reached its present location. Herodotus said the Armenians were Phrygian colonists and the prevailing opinion is that they at least came by a similar route from the Balkans about 3000 years ago (Herodotus VII, 73; Mallory 1989: 34-35 [from Diakonov]). However, there is another possibility, quite obvious although rarely mentioned. Perhaps Armenian is descendent from the language of the Cimmerians who originally lived on the Pontic Steppe but by 700 BC had crossed the Caucasus and were making a nuisance of themselves in Anatolia (see West 2007: 9; cf. Sulimirski & Taylor 1991: 555-560). Here, they probably had a hand in destroying the Urartu kingdom in present day Armenia before disappearing from written records at about the same time as the Armenians are first mentioned. It seems possible that the language of these mobile horsemen was adopted as a common language for the diverse populations that lived in the land that was to become the Armenian kingdom. In this way the establishment of Armenian in Anatolia may have followed a similar trajectory as Persian, Turkish and Hungarian: a nomadic population used a detached steppe environment to establish itself among more settled populations and then built a state that consolidated and expanded these conquests and confirmed their language as the dominant one. The linguistic position of Armenian as a member of the southeast group, intermediary between Greek and Indo-Iranian, matches what we could expect of the Cimmerian language – which unfortunately is totally lost.

One of the most difficult problems of IE studies is how to explain the eastern distribution of the Indo-Iranian languages and especially the Indo-Aryan languages in India. This is a problem common to all reasonable homeland hypotheses; all of them assume an Indo-Iranian

expansion into the Central Asian Steppes, usually in relation to the Andronovo cultural horizon that emerged there around 2000 BC. The problem is how to explain their distribution in southern Asia, especially the Indo-Aryan languages in India.

The CT hypothesis does not require a special solution to this problem and, therefore, I shall only discuss it briefly. Elite dominance is sometimes invoked as an explanation but, as previously mentioned, this is not a very convincing vehicle for large-scale language displacement in non-state societies. Besides, the evidence of haplogroup R1a1a (above), showing marked concentration in northern India, seems to indicate a genetic relationship explainable by significant population movements (although some recent research seems to question the genetic link; Underhill e*t al.* 2009).

It is tempting to link the movement to India to the Bactrian-Margiana Archaeological Complex (BMAC) which flourished in the early 2nd millennium in the fertile valleys and oases along the southern edges of the Central Asian Steppes until collapsing or disappearing around 1700-1600 BC, a time when it seems likely that the Indo-Aryans entered the Indian subcontinent. Some scholars suggest that the collapse of BMAC had something to do with bringing the Indo-Aryans south but others disagree.[15]

Applying the expansion cycle model, it seems quite possible that the BMAC constituted a competitive system and its collapse may in fact have been an expansion cycle that was intense enough to destroy the original system and transform its culture. The resulting population explosion would result in migrations of enough intensity to explain the beginning of the Indo-Europeanization of India, assuming that the BMAC had acquired an IE language. However, maintaining that this is in fact what happened

[15]Among those suggesting such a connection are Mallory & Mair (2000: 262, 266-267). Those disagreeing include e.g. Witzel (2003). Kohl (2002: 167-173) argues that the archaeological evidence documents precisely the inclusion of pastoral steppe elements (presumably Indo-Iranian) in the formation of BMAC. For a relatively balanced overview of the Indo-Iranian problem and the BMAC and Andronovo cultures, see Lamberg-Karlovsky (2002). For a recent detailed discussion see Kuz'mina (2007).

would be foolhardy for a non-specialist and there is no need to subscribe to a particular theory regarding India within the framework of the CT hypothesis.

Expansions of the Corded Ware and Related Cultures

While the ancestors of the Indo-Iranians were going east, the CT culture was dissolving in the west. How and why this happened is poorly understood but we do know that it was gradually replaced by other cultures, some of which may very well have emerged from CT itself. As the CT culture shrank it split into two surviving pockets that finally disappeared or were transformed into something else by around 2800 BC. Perhaps it is significant that CT remains are primarily settlements whereas the successor cultures are best known from their graves. This may mean that the break in continuity was less than it appears since we are simply dealing with different kinds of evidence. Only beginning in the mid 4th millennium do we find some CT cemeteries (above) and at least on the middle Dnieper, the continuity with the succeeding culture is generally accepted (below).

In place of CT settlements we find remains that belong to steppe groups (on the steppe margin) or groups such as the Globular Amphora culture. The most important of these successors, however, was the Corded Ware culture or cultural horizon, for it existed in many variants, that emerged over large parts of northern Europe around 3000 BC. The origin of this culture is not well understood but it has been suggested that late Funnelbeaker or Globular Amphora groups were involved although it is clear that elements of both persisted in some places even after the emergence of Corded Ware. On the other hand, at least one Corded Ware group, the Middle Dnieper culture, emerged directly out of the eastern pocket of the late CT culture, in the vicinity of modern Kiev, after having ingested influence both from the steppe and the west (Anthony 2007: 348, 377). There is every reason to believe that Proto-Slavic evolved directly out of the dialects spoken in the Middle Dnieper culture and ultimately from the late CT groups that preceded it.

The reason behind the success of the Corded Ware cultural complex was probably its new and innovative

lifestyle, which would have allowed its people to embark on colonizing expansions. By the 4th millennium BC much of Europe was only superficially settled by farmers. The CT culture was fortunate to control land that was both open and fertile and thus admirably suited for agriculture but such land was relatively rare. Areas with higher rainfall had dense forests that were difficult to clear and easily worked and perennially fertile soils, such as loess or Ukrainian black soil, were limited. In many places, hunting and gathering were still significant ways of life. It was only with the Secondary Products Revolution (above) that new methods of farming emerged, methods that not only increased productivity in the old farmlands but allowed new lands to be used for farming. Ploughing and manuring were important innovations but perhaps the most significant feature of this transformation was the use of livestock to utilize marginal lands. Animal husbandry rose significantly in importance compared to crop-growing. By adopting a more extensive strategy for farming, lands that had hardly been used at all were now made to provide for a growing population. Settlements are rarely found in the Corded Ware culture and may have become less substantial and more dispersed, probably reflecting a population that used more of the land productively than before although it was used less intensively than earlier farmlands. This called for increased mobility with animals pulling wagons or carrying loads. The lifestyle of the Corded Ware culture has been called semi-nomadic although most people probably had permanent homes (based on skeletal remains, Sladek *et al.* 2006 argue against a significant increase in individual mobility).

The people of the Corded Ware culture infiltrated regions previously occupied by other cultures. They didn't necessarily have to expel the indigenous population since they often sought out lands that were hardly used by them. They also seem to have stimulated the locals to adopt a similar way of life, possibly because the new lifestyle was considered desirable. The difference between Corded Ware and Funnelbeaker or Globular Amphora cultures gradually diminished and in some cases, at least, they seem to have merged such as in the eastern Baltic where Corded Ware, Globular Amphora and indigenous cultures fused to

form the Bay Coast culture (Rimantienė 1992: 127).

The Corded Ware culture may first have emerged close to the Polish-Ukrainian border in a region earlier "occupied by late TRB [*Funnelbeaker*] communities infiltrated by late Tripolye groups," according to Anthony (Anthony 2007: 368). It spread rapidly, perhaps through a mixture of migration and local adoption. The IE dialects that gave rise to the northwest languages are almost certainly to be sought in relation to the Corded Ware cultural horizon although the details are uncertain.

The western languages, Celtic and perhaps Italic and others, may be related to the Bell Beaker culture rather than Corded Ware proper. The Bell Beaker culture was in many ways similar to Corded Ware and the lifestyle may have been more or less the same. However, the relationship between the two is not at all clear (see Vander Linden 2007). The Bell Beaker culture is often assumed to represent a transfusion of cultural elements rather than a migration but there is strong evidence, at least in Bavaria, that the Bell Beaker culture was brought in by a migrating population from the northeast (Price *et al.* 1998). Nevertheless, the culture spread over large parts of central and western Europe and there is an ongoing debate on whether it originated in the western part of the North European Plain or the Iberian Peninsula. Even if Bell Beaker cultural elements are recognizable from around 2900 BC in Iberia, most of the Bell Beaker expansion seems to have originated from a belt stretching from Bohemia to the North Sea coast and only started about 2500 BC. Here, on the edge of Corded Ware expansion, a mixture of IE speaking immigrants and locals may have developed into a new competitive system with its own unique culture. Some of this culture could have had its roots in the seafaring Atlantic community, explaining the link with Iberia. The Bell Beaker expansion that started around 2500 BC would then have been an expansion cycle similar to the ones that propelled the original IE expansion.

The remains of the eastern CT culture developed Corded Ware characteristics and was transformed into the Middle Dnieper culture, included in the Corded Ware

horizon, and started to expand from there to the north. This part of the Corded Ware population may have spoken dialects that were different from those prevalent further west in the Corded Ware horizon. Deriving the origins of Balto-Slavic from the Middle Dnieper culture seems unproblematic.

The Corded Ware horizon was perhaps brought to southern Scandinavia by two different routes, one from the south; the Single-Grave culture – and the other from the east; the Battle-Axe or Boat Axe culture. It has been suggested that Proto-Germanic, or rather the IE dialect ancestral to it, was formed where two IE dialects met and an eastern dialect, akin to Balto-Slavic, came under heavy influence from a western dialect, akin to Italic and Celtic. This would explain some special characteristics of Germanic and how it resembles Balto-Slavic in many respects and Celtic or Italic in others (Ringe *et al.* 2002: 110-111). This suggestion seems compatible with the archaeological evidence.

Any believable account of the expansion of IE dialects has to account for the position of the Tocharians in the Tarim basin far to the east, in the extreme western province of China, Xinjiang or Eastern Turkestan. Most scholars think there likely is a connection between the Tocharian languages and the mummified corpses of the Tarim basin, remarkably preserved in the dry climate, clearly of western physical type. Tocharian is a problem because of its apparent relationship with western (*centum*) languages such as Germanic, Italic and Greek. In linguistic terms, Tocharian seems to be a western language although in geographic terms it is most decidedly an eastern one.

Within the framework of the Kurgan hypothesis, Tocharian predecessors are usually equated with the Afanasevo culture that emerged in the Altai region around 3500 BC (Mallory & Mair 2000: 294-296, 314-316; Carpelan & Parpola 2001: 60-62; Anthony 2007: 264-265, 307-311). This culture shows considerable similarities to the steppe cultures of the European steppe and the Yamna cultural horizon that emerged there at a similar time. This is all the more remarkable because nothing like it has yet been found in the 1,500 km that separate the two. The Afanasevo connection works relatively well within the

Kurgan hypothesis although there is no evidence of wheels or wagons in Afanasevo. Neither does it explain the western connection of the Tocharian languages and this forces Kurgan theorists to either seek ways to refute the data that suggest it or explain them away as archaisms, also necessitating an early separation of the western dialects for which there is limited evidence (e.g. respectively Mallory & Mair 2000: 285-294 and Anthony 2008: 15). Tocharian certainly does show some archaic features and it is widely accepted that it was the second dialect, after Anatolian, to loose contact with the central IE dialects. It must have been quite early in the IE expansion that the ancestors of the Tocharians embarked on their own journey, separated from what was happening in the IE zone that formed a continuum of mutually intelligible dialects that stretched from the North Sea almost to the Caspian Sea at least in the early 3rd millennium BC.

The evidence for a western connection, albeit a remote one, seems quite solid and the link with Germanic seems especially robust but also with Italic and Greek and there may also be some connection to Albanian, Celtic and Balto-Slavic (Adams 1984; Adams 1995). Furthermore, recent genetic research indicates that a few of the Tarim mummies show a specific western or central European affinity of their mitochondrial DNA, indicating maternal lineages (Li *et al.* 2010: 6-9). This seems to mean that at some point, women from western or central Europe were incorporated into the population that ended up in the Tarim Basin. Presumably, this happened through marriage and is best explained by an original western location of the Tocharian branch within the IE community.

There does seem to be a way to account for the Tocharians within the CT model (and some others) that is seldom mentioned; which is surprising because it seems quite straightforward.[16] The linguistic evidence tells us two things about Tocharian origins: it came from the western part of the IE range and it separated early from the IE

[16] Although more than twenty years ago Leo S. Klejn introduced ideas somewhat similar to the ones proposed below. Professor Klejn was kind enough to send me a copy of his new article on the subject prior to its publication (Klejn *forthcoming*).

community. This would indicate an origin close to or within the Corded Ware complex and a separation starting as early as around 3000 or even 3500 BC. Given the linguistic connections of Tocharian we should probably link them with the central or western part of the Corded Ware culture rather than its eastern half, thereby connecting it with Germanic or Italic rather than Balto-Slavic (although there seems to be a possibility of contact between Tocharian and Slavic; Nakhle *et al.* 2005: 406-407). This doesn't seem to represent a problem because there was an early offshoot from the Corded Ware centre, mixed with Globular Amphora traits, that passed right through Russia, all the way to the Ural Mountains. This was the Fatyanovo-Balanovo culture (Anthony 2007: 380-382).

One may even suggest that the Tocharian branch originated specifically in the Globular Amphora culture that emerged on the North European Plain around 3400 BC. Perhaps this was founded by a predominantly male exodus from the 2nd CT expansion that joined up with local women, explaining the local Funnelbeaker roots of Globular Amphora pottery. This would also account for western mitochondrial DNA among Tarim mummies. The Globular Amphora culture later spread into the original Cucuteni homeland (western CT), where they may have come into contact with IE dialects ancestral to Greek, before mixing with Corded Ware elements in the eastern CT zone stimulating the formation of the Middle Dnieper variant of Corded Ware. Finally, perhaps around 2800 BC, some mixed Globular Amphora and Corded Ware elements departed for the deep Russian forests. It seems entirely possible that a language or dialect of Globular Amphora origins became dominant within the emerging Fatyanovo culture.

There was not just one IE push to the east but two, one on the steppe and the other in the forest zone. They had different origins and presumably spoke different dialects, in fact dialects that were probably quite distinct from each other to begin with and may have become mutually unintelligible by the time these two came in contact again in the Abashevo culture after the mid 3rd millennium BC.

The Fatyanovo culture represents a thinly spread

exodus to the east through the forest zone but in the Ural foothills these migrants prospered through mining and metal-working and established substantial settlements in the Balanovo culture (Anthony 2007: 380-382; Koryakova & Epimakhov 2007: 99-102). There is little doubt that Fatyanovo and Balanovo are just the two parts of a single culture, presumably with the same predominant language. This language probably originated on the North European Plain and was the remote ancestor of the two Tocharian languages preserved in texts from the 1st millennium AD.

We need not go into details on how these languages migrated from the Volga to the Tarim Basin (some of these problems are discussed by Klejn *forthcoming*). One obvious possibility is a connection through the Abashevo culture of the eastern forest-steppe that partly succeeded the Fatyanovo-Balanovo culture and shows considerable similarities to it (see Anthony 2007: 382-383; Carpelan & Parpola 2001: 93-96). Kuz'mina bluntly states that the Abashevans had their roots in the Fatyanovo and Balanovo cultures and ultimately in central Europe (Kuz'mina 2007: 384). Abashevo in turn seems to have heavily influenced the formation of the Andronovo culture of the Central Eurasian Steppe. These cultures are usually assumed to have been predominantly Indo-Iranian speaking but of course there is no proof of this. In fact, we have no reason to assume that a single language was predominant throughout the vast region of the Andronovo culture, which was quite variable and should properly be thought of as a horizon representing a lifestyle rather than a single culture (for the Andronovo culture and its assumed Indo-Iranian character, see Mallory & Mair 2000: 260-261). Like the Indian buffalo hunters of the American Great Plains, the people that shared the Andronovo culture may have been of diverse origins, speaking different languages, who's lifestyle and culture converged as they entered the steppe. Tocharian-like elements may very well have been present in it, especially to the north and east and this brings them right next to the region where they are historically documented.

In fact, elements of the Andronovo horizon were established much closer to the confirmed Tocharian homes in the Tarim basin than was the Afanasevo culture,

favoured by Kurgan theorists. The Tocharians also had to pick up knowledge of irrigation agriculture before they entered the Tarim basin, probably around 2000 BC, and it seems most logical that they acquired this knowledge through contact with elements of the BMAC, which again fits much better to the Andronovo than the Afanasevo culture (for the archaeological background for these arguments, see Mallory & Mair 2000: 306-314, although they argue for Afanasevo, of course).

The eastern locality of the Afanasevo culture, given its affinity to the western steppe cultures, is quite interesting but there is no need to assign an IE language to it. If Anthony is right when he suggests that some sort of conflict prompted the long trek of the Afanasevans from the European steppe to the Altai mountains, one can suggest (or guess rather) that behind such a conflict lay a confrontation between the new IE ethnicities on the steppe, originating in the west, and some of the old inhabitants that were compelled to take flight (see Anthony 2007: 307-308). If one is threatened from the west, the natural escape route is to the east.

To this amateur archaeologist, the sequence that brings Tocharians from the North European Plain to central Asia does not appear to have serious problems and is supported by the exchange of loanwords between Tocharian and Finno-Ugric, which would have occurred in the Fatyanovo-Balanovo culture (see Gamkrelidze & Ivanov 1984/1995: 829-830). It would mean that for a while, well into the 2nd millennium BC, Tocharian-like peoples, perhaps cousins to the ancestors of the true Tocharians in the Tarim Basin, were important in central Asia, perhaps even more important than Indo-Iranians or Iranians. It may be that the latter only became dominant after they mastered horseback warfare at the end of the 2nd millennium BC.

The linguistic and genetic evidence seems to indicate a route for the Tocharians that originated in central Europe among the ancestors of the Germanics and Italics and their eastern exodus brought them into contact with the Greeks and Balto-Slavs before taking up residence near Finno-Ugrians. This route appears to be matched very closely in time and space by the Globular Amphora and

Fatyanovo-Balanovo archaeological sequence.

Conclusions

In recent years several scholars have claimed that the IE homeland problem has been solved even though their solutions differ. I make no such claims. It is the kind of problem that will probably never be solved to everyone's satisfaction; we just don't have the evidence needed to do that. However, I believe that the current hypothesis provides a good solution to the problem and, as far as I can see, seems to have significantly fewer difficulties than previous solutions – although others will no doubt disagree.

However, there is more at stake here than finding the IE homeland. Although fascinating, the quest for the homeland is of dubious historical importance when it is pursued simply to advocate one geographical location instead of another. More important is how the spread of IE languages can help us illuminate prehistoric expansions of which we otherwise would know very little. The expansion cycle model was constructed to explain historical expansions and this is the first time it has been used for such remote prehistoric times. It seems that it works very well and has the potential to improve our understanding of prehistoric language spread, migrations and society in general although we should keep in mind that not everything may have functioned the same way in prehistoric expansions as in historical ones. At the most basic level, the model explains IE expansion through unusual population growth, brought on by internal competition within the CT culture.

Prehistory has its own specific problems and, without narrative sources, it is very difficult to recreate political alliances and ethnicities, let alone languages. Archaeological 'cultures' were not *necessarily* any political or ethnic units although they probably often were. The correlation between the two is probably least reliable in times of turmoil, when alliances and ethnicities were rapidly changing; precisely the situation we may expect at the time of IE expansion.

It makes sense to assume that before the IE expansion began we should be able to find an archaeological culture that is more or less identical to the

PIE homeland. People sharing the same culture frequently also share the same language and people sharing the same language often possess a shared culture. However, once the expansion began this culture would break up and diverge very quickly as the emigrants adopted new ways of life and mixed with indigenous populations. As soon as the Indo-Europeans started to expand, their movements muddy the waters and we should not expect to be able to trace them archaeologically with any ease. This should be obvious from the fact that we are still arguing about such movements. The divergence of culture, as it can be traced through archaeology, would work at a much faster rate than the divergence of languages and, for a while, this would produce a situation where a number of quite different cultures would still have mutually intelligible languages or dialects that were gradually drifting apart.

Most scholars would agree that at least the Corded Ware and Yamna cultures must have been predominantly IE speaking and although their material cultures, as established through archaeology, differ significantly, their language, customs and belief systems may have been quite similar. These peoples may even still have shared some sense of common identity well into the 3rd millennium BC. Indeed, the difference between the Corded Ware and Yamna cultures may largely have been a difference of subsistence; they had colonized very different habitats and adopted different ways of life so perhaps we shouldn't be surprised that the border between them closely follows the environmental border between the steppe and the forest.

Previous solutions to the IE homeland problem have mostly explained the inevitable IE character of both cultures by migration or infiltration from the steppe to the forest or from the forest to the steppe. The current hypothesis differs in this respect by seeking the homeland right on the border between the two – the forest-steppe. This makes the transition to the two environments, and ways of life, far easier to explain especially since, with the expansion cycle model, we now have a way of explaining why the expansion took place and was able to deposit IE languages in vast regions on both sides of the forest-steppe.

It is now time to present a provisional scenario of early

IE dialect division based on the CT hypothesis. It should be able to explain all relationships between the IE branches as we know them. The scenario presented here certainly isn't perfect but it's a start and I think it best to present it by showing a hypothetical map (Figure 2) of IE languages and dialects from the middle of the 3rd millennium BC.

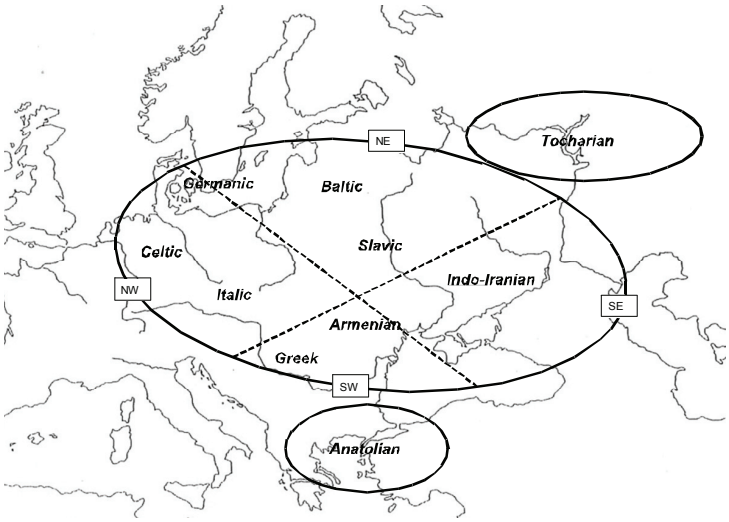

Figure 2. IE languages and dialects in the middle of the 3rd millennium BC. The map is schematic and locations should not be interpreted as precise. Circles indicate separate languages. Units within the large circle represent IE core dialects but the transition to separate languages had started. Language names should properly be prefixed by something like "pre-proto-" but this is omitted for simplicity's sake. For the four 'quadrants' see main text.

The first dialect division would have emerged between the western (Cucuteni) and eastern (Tripolye) halves of the CT culture, the latter emerging as the Ukrainian forest-steppe was colonized. This may seem similar to the classic but depreciated centum-satem split but this division is probably much older and may predate the formation of the centum-satem isogloss by a millennium or more. Nevertheless, it seems quite likely that the centum-satem division later emerged broadly (but not necessarily precisely) along this old dialect border.

The second division would have emerged as a result of the 1st CT expansion. Most importantly it caused the Anatolian dialects to separate out of the western half to the south but it may also have produced some pockets of IE speakers both on the North European Plain and the steppe and these pockets may have influenced IE dialects brought to these parts in later expansions.

The 2nd expansion would have produced a migratory movement from the western (Cucuteni) half to the NW into the North European Plain where it resulted in the formation of the Globular Amphora culture around 3400 BC. Presumably, this was the beginning of Tocharian separation and some of these Globular Amphora dialects later moved far to the east.

The steppe was also colonized during the 2nd expansion, extending the IE homeland, and this would have produced a new dialect formation within the IE core dividing steppe dwellers form forest-steppe dwellers and superimposed it on the earlier west-east division so now we have a fourfold split in the residual dialects. Eastern groups seem to have dominated in the steppe colonization but at the western end they may have mingled with some western groups or infiltrated western populations on the forest-steppe creating a dialect region with close links with both the western (Cucuteni) groups and the eastern steppe groups. We can now divide the IE core (i.e. all except Anatolian and Tocharian) into four quadrants:

> *NW quadrant*. Originally in the western or Cucuteni homeland but soon the main source of the Corded Ware expansion. Celtic, Italic and several lost IE branches would have had their roots here, probably including, Illyric, Venetic, Lusitanian and Ligurian.
>
> *NE quadrant*. Originally in the eastern or Tripolye homeland but later expanding mainly to the north and becoming a part of the Corded Ware horizon through western influences. Slavic and Baltic have their roots here and Germanic may have emerged through a mixture of NE and NW dialects.

> *SE quadrant.* Emerged as the eastern (Tripolye) groups colonized the steppe. This is where the Indo-Iranian branch comes from and possibly the Armenian one as well, although a SW origin seems just as likely.
>
> *SW quadrant.* Emerged on the western extremities of the steppe or on the forest-steppe under SE influences. It is probably best represented as a mix of NW and SE characteristics. Greek belongs here and probably Armenian and Phrygian as well. A case could possibly be made to treat the SE and SW quadrants as one and many historical linguists treat them all as belonging to a southeast or central group (not to be confused with the SE quadrant).

Albanian probably descendent from some Daco-Thracian language rather than Illyrian (although opinions differ) and it is very difficult to place and therefore missing from the map. My guess is that it had a kind of a central position, possibly originating in the original Cucuteni area after it had been heavily infiltrated by SE groups and perhaps also by Globular Amphora / Tocharian elements.

The dialects of each quadrant are close to each other and each quadrant is generally closer to those next to it than to the one diagonally opposite although one should not become pedantic in such formulations.

Many details of this scenario remain uncertain and should be subject to revisions. Its main point, however, is quite clear; it indicates the Cucuteni-Tripolye culture as the most plausible Indo-European homeland and seems to adequately explain the expansion from this core. Several later expansion cycles continued to spread IE languages throughout Europe and probably in Asia as well but these are outside the scope of the present paper.

Finally, I must reiterate that this is a hypothesis – it is not the ultimate 'truth'. While I believe that it is a very promising hypothesis I lack the expertise in archaeology and historical linguistics to either confirm or reject it. It is simply my hope that such experts may find this hypothesis worth considering.

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