

# **A Spatial Analysis of Neolithic Cultures throughout Eastern, Central, and Northern Europe in Relation to Proto-Germanic**

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Over the years linguistics and archaeology have been synthesized in order to explain how various language families formed. However, studies examining the problem from a uniquely geographic perspective are lacking. This study examines how the Proto-Germanic language formed. Archaeological, geo-genetic, and temporal data were gathered and placed into a GIS for analysis using statistics and intersects. The results suggest that Proto-Germanic was formed somewhere in southern Scandinavia through a process of intermingling after an initial clash between an indigenous agricultural group and an intrusive tribe from the North Pontic Steppes.

## **Introduction**

Over time, various scholars have synthesized linguistics with archaeology to account for the origins and ethno-genesis of various groups of people. Such endeavors have in part led to the current classifications of linguistic and ethnic groups that are found in most encyclopedias and textbooks. Still, many changes regarding how linguistic and ethnic groups are broadly classified have been made. Different paradigms and factors have emerged throughout the years.

German, as an Indo-European language, has been one of the topics where linguistic and archaeological data have been synthesized in an attempt to acquire perspectives on the origins of the Germanic-speaking group of Indo-European languages. A sizable non-Indo-European lexical substratum in German has been acknowledged by scholars in many different fields, including Marija Gimbutas (1982), Edgar Polomé (1987), John Geipel (1969) and Terry Jordan Bychov (2002). This has generated a debate about whether or not there was an actual indigenous group in southern prehistoric Scandinavia (the traditional cultural hearth of the Germanic-speaking peoples) as well as throughout central Europe that spoke a

*Volume 35, Number 1 & 2, Spring/Summer 2007*

non-Indo European language. Furthermore, was there an abrupt linguistic and cultural change caused by an intrusion into this region during 3rd and 2nd millennium BC by Indo-European-speaking pastoralists from the North Pontic steppes? Some argue that these invading people had a culture identified with the presence of single barrow graves known as *kurgans* (a Russian word taken from a Turkic language meaning 'barrow').

Further, there is ambiguity about how languages are classified. German is said by some to be an *Indo-Europeanized* language. The basis for this rests on the premise that there is a 30% non-Indo-European lexical component found in the modern German language (Polomé 1987). Yet, what specifically constitutes an Indo-Europeanized language in numerical terms regarding lexicon is not discussed. Similarly, English contains mostly Latin based words (roughly 50-60% of the lexicon), yet retains the distinction of being classified Germanic (Williams 1975). What can be concluded from this discourse is that linguistic analysis alone can result in an ambivalency regarding the definition of languages and their respective linguistic groups.

#### **Statement of the Problem**

This study addresses the geographical origins of the Proto-Germanic language and how it evolved. The study will entail a synthesis of geographical, linguistic, historical, genetic and archaeological data. Prior studies have revealed an absence of geographical work concerning the problem, as well as a lack of synthesis among these academic fields. Therefore, this study will examine and analyze the alleged geographic diffusion of the Kurgan culture from out of the North Pontic steppes to southern Scandinavia circa the 3rd millennium BC. This proposed diffusion will be compared to the linguistic, historical, genetic and archaeological evidence provided, to determine if the migration corresponds with any linguistic changes in the region both spatially and temporally.

The study is based on the working hypothesis that Proto-Germanic represents an Indo-Europeanized language and that the process of Indo-Europeanization corresponds to the diffusion of the Kurgan culture from the North Pontic steppes into Central and Northern Europe during a time period beginning *c.* 5000 BC and lasting until *c.* 1900 BC. The

hypothesis also maintains that the 30% non-Indo-European substratum found in modern German derives from non-Indo-European-speaking people(s) indigenous to southern Scandinavia. When Indo-European speakers came into contact with the indigenous peoples during the 3rd millennium BC, they came to dominate the local populations yet parts of the indigenous lexicon persisted in the formation of Proto-Germanic, thus giving German the status of being an Indo-Europeanized language.

### **Gimbutas' Kurgan Culture Theory**

One of the most popular paradigms to emerge that accounts for an IE homeland was Marija Gimbutas' Kurgan Culture Theory. Her theory, introduced in 1956, was in part based on the work of several other archaeologists before her. Much of Gimbutas' work on this subject has been reprinted collectively in *The Kurgan Culture and the Indo-Europeanization of Europe*. In one of her works featured in the book, she states that "the cultures in South Russia of the 5th millennium B.C. are the mother cultures of all later cultures which are attributed to the speaking of south, west, and north "Indo-European" (Gimbutas 1997d: 3). Gimbutas gave these mother cultures the collective title of Kurgan culture. She further described the areal extent of the Kurgan culture, which "covers early, middle, and late periods of cultural development between the lower Dnieper and southern Siberia and all its synchronous manifestations outside this area" (Gimbutas 1997e: 76). The common core component shared by all these cultures is the single grave in deep shafts with a mound over top (Gimbutas 1997c: 129).

This study is primarily concerned with the Kurgan culture hearth between the Don and Dnieper rivers known as the North Pontic Steppe cultural area; it is the oldest to date according to her formulations (circa middle of the 5th millennium BC). It also represents the area from which Gimbutas claims the Kurgan culture and its people diffused west into central and northern Europe. Gimbutas also claims that the spread of Indo-European languages corresponds to this geographical diffusion pattern, thus placing the formation of the Proto-Indo-European language roughly in the North Pontic Steppe region circa mid 5th millennium BC.

At the time that the Kurgan culture came into being, a separate distinct culture existed in northwest Europe consisting of non-Indo-European speaking people of “Old Europe”. According to Gimbutas Old Europe (the term Old Europe is used for Pre-Indo-European Europe during the Neolithic, Chalcolithic and Copper ages) existed for nearly 3 millennia (c. 6500-3500 B.C.) without major cataclysms. The culture rose in a linear fashion, unbroken by destruction or disruptions. The people lived in an egalitarian society, very probably in a matrilinear system, had virtually no weapons except in the last (Copper Age) stage, and indulged in arts and crafts, stimulated by their ideology and mythical imagery. (1997g: 240). Additionally, these people often dwelled in “large agglomerations”, were sedentary-horticulturalist, had an ideology which “focused on the eternal aspects of birth, death, and regeneration, symbolized by the feminine principle, a mother creatrix”, buried their dead in communal megalith graves and were generally peaceful (Gimbutas 1997g: 241).

This social structure contrasted with the Indo-European Kurgans who were mobile and non-egalitarian; their system was accordingly ranked into a three category hierarchy: warrior priest rulers, warrior nobility, and laborers/agriculturalists at the bottom. The IE Kurgans were also warlike, lived in smaller villages at times, and had an ideology that centered on the virile male. Their gods were often heroic warriors of the shining and thunderous sky rather than peaceful mother goddesses of birth and regeneration. In sum, when comparing and contrasting these two groups through the eyes of Gimbutas, it can be said that, “the Old Europeans put no emphasis on dangerous weapons whereas the Kurgans glorified the sharp blade” (Gimbutas 1997g: 241). What eventually occurred was the “drastic upheaval of Old Europe” as the:

three millennium long traditions were truncated by 2 waves of semi-nomadic horse riding people from the east: the towns and villages disintegrated, the magnificent painted pottery vanished; so did the shrines, frescoes, sculptures, symbols and script. (Gimbutas 1997g: 240 )

Accordingly, this is all evident in:

...the archaeological record not only by the abrupt absences of the magnificent painted pottery and figurines and the termination of sign use, but by the equally abrupt appearance of thrusting weapons and horses infiltrating the Danubian Valley and other major grasslands of the Balkans and Central Europe. Their arrival initiated a dramatic shift in the prehistory of Europe, a change in social structure and in residence patterns, in art and in religion and it was a decisive factor in the formation of Europe's last 5,000 years. (Gimbutas 1997g: 240)

A final major point that can be extracted from Gimbutas' work in addition to the socio-economic, cultural, and linguistic impacts regards the genetic consequences of this outside infiltration into Western Europe:

The change in physical type of the population was marginal or uneven (more effective in the east than in the west). The process of Indo-Europeanization was essentially a cultural, not a physical transformation. It must be understood as a military victory in terms of successfully imposing a new administrative system, language and religion upon the indigenous groups. The social organization greatly facilitated the Kurgan people's effectiveness in war. The patrilinear and patriarchal structure and tripartite class system of rulers, warrior nobility, and laborers is proved by the Indo-European mythologies. The Old Europeans had neither a warrior class nor horses. They lived in (probably) theocratic monarchies presided over by a queen-priestess. (1997f: 316)

Eventually, certain aspects of the Indo-European speaking Kurgan people's culture and language, along with the people themselves, made their way into southern Scandinavia circa the 3rd millennium BC. This gradual process can be categorized according to Gimbutas' four Kurgan time periods, which serve not only to mark the time frame, but also the areal extent of the culture:

Kurgan I – the 5th millennium B.C., a period of relative uniformity known from the sites in the Dnieper-Volga steppes east of the Cucuteni (Tripolye) civilization. The archaeological label of this complex is "Srednij Stog II"

in the Dnieper and Don basins and the earliest “Yamna” or “Pit-grave” in the lower Volga, lower Ural, and north Caspian regions.

Kurgan II – the first half of the 4th millennium B.C., the time of the beginning of a crisis west of the Black Sea when Kurgan II graves appear in the area of civilized Old Europe and infiltrate central Europe via the Danube. At this stage Old European civilizations continue their existence.

Kurgan III – the second half of the 4th millennium B.C., this phase is marked by a formation of a new culture in the northern part of the Balkan Peninsula and east central Europe (the Cernavoda-Boleraz-Proto-Baden-Baden complex) in central Europe (the Globular Amphora complex) and in Transcaucasia, all bearing Kurgan elements. This period saw the complex process of hybridization or “kurganization” resulting in marked changes in economy, social structure, and religion. The horse in strategic positions in the former lands of the Vinca and Lengyel civilizations are converted to strongholds and tribal centers; not a single town or village of Old European character is known in these areas.

Kurgan IV – the early 3rd millennium B.C., marked by the consolidation of tribal groups dominated by the Kurgan elements and the increase of mobility and expansion. This is the time of Corded-Battle-Axe complexes in the Pontic steppes, the Maikop phase in the northern Caucasus, and the period of destruction of towns in the Aegean and in the eastern Mediterranean. Northern Europe up to southern Sweden and southern Finland and Greece were “kurganized” (Gimbutas 1997a: 182-183).

The diffusion occurred in three waves. This study is most concerned with the alleged “Third Wave” which occurred soon after 3000 B.C. (coinciding with Kurgan IV); it was triggered by population migrations out from east central Europe (Gimbutas 1997b: 366). New areas of settlement were gradually reached in present-day northern Europe, southern Scandinavia, the East Baltic area and central Russia (Gimbutas 1997b: 366). “Heir to the Globular Amphora culture” of east-central Europe, the Corded-Ware-Battle Axe people “diffused north into the East Baltic area and southern Scandinavia”

(Figure 1) (Gimbutas 1997b: 366). “By 2000 B.C., the world of Old Europe had been transformed, except for Old European groups on Crete, on Aegean Islands and in Iberia” (Gimbutas 1997b: 367).

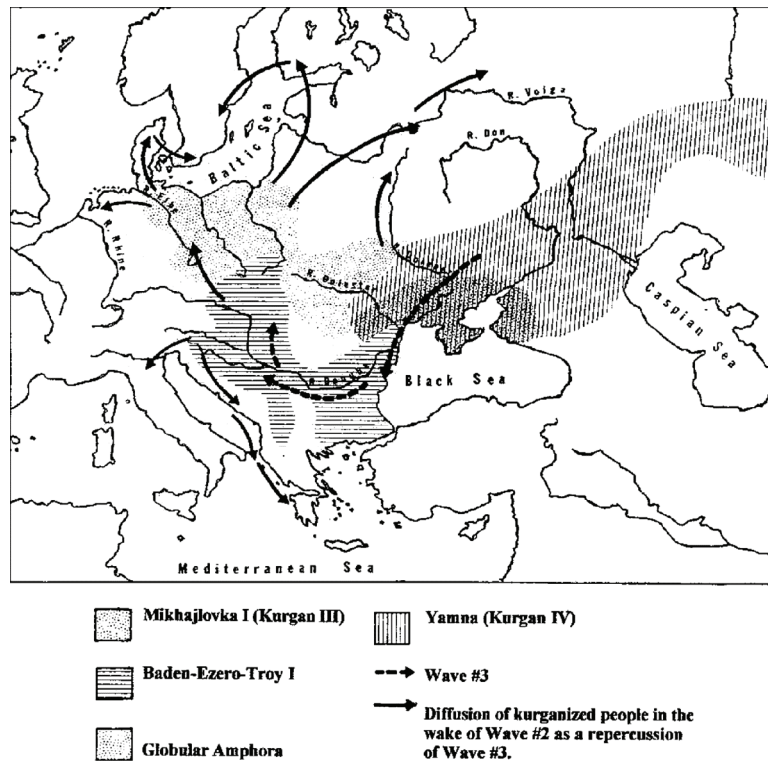


Figure 1. Gimbutas’ Kurgan Model of Diffusion (Gimbutas 1997).

### Other origins

More recently, contrary schools of thought have emerged placing the PIE homeland in different locations and developing under different time frames and processes. One such paradigm traces the beginnings of PIE to the southeastern-most fringes of Anatolia circa 8000 B.C. along with the spread of agriculture (Figure 2). British archaeologist Colin Renfrew in his 1987 book *Archaeology and Language: The Puzzle of Indo-European Origins* argues that agriculture is what pushed people to expand, then spreading their language as well.

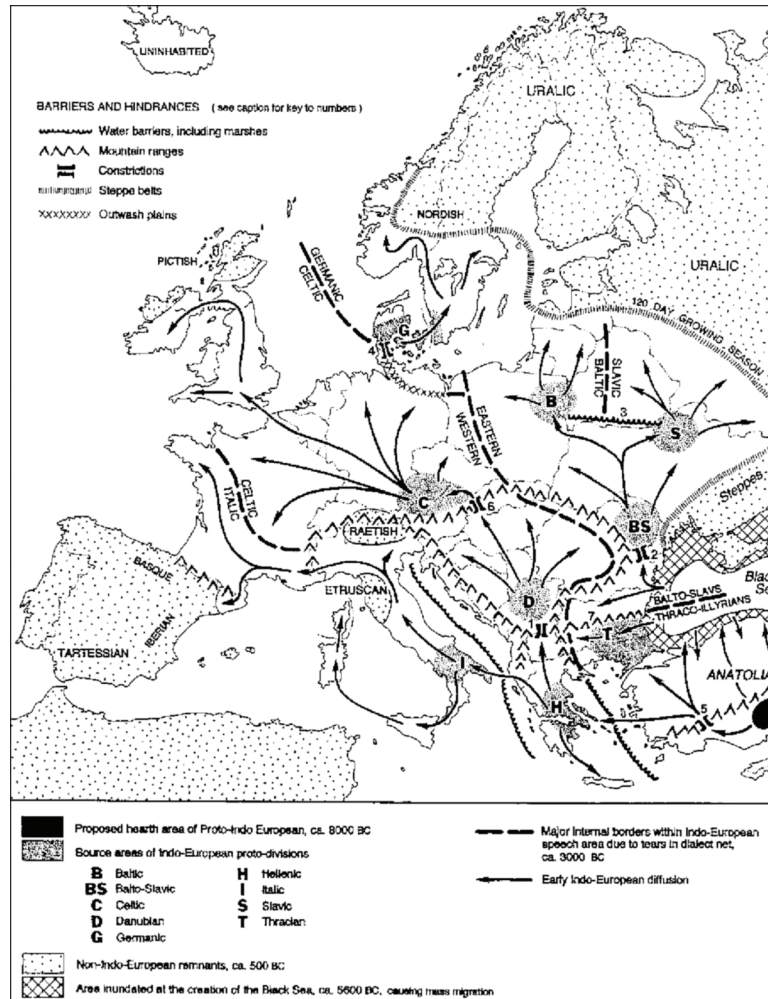


Figure 2. Renfrew's paradigm as presented by Jordan-Bychov and Jordan (2005).

Another recent theory, the Paleolithic Continuity Theory, emerged from studies conducted independently by several archaeologists and linguists. As a result, there is really no uniformity to this theory that manifests itself in multiple forms. German archaeologist Alexander Häusler is the most fervent supporter of this theory.

Häusler's version, perhaps the best known, was presented in an article entitled "Zur Problematik des Ursprungs der Indo-Germanen" (2004). He began by stating what he felt was most



likely the original extent of the speakers of PIE:

Überblicken wir die Kulturentwicklung Europas, können wir für das Gebiet zwischen Nordsee und Kaspischem Meer, von Griechenland, Südosteuropa und Europa nördlich der Alpen bis nach Skandinavien und ins Baltikum, zumindest seit dem Mesolithikum eine kontinuierliche Weiterentwicklung ein und derselben Bevölkerung feststellen. (Häusler 2004)

From this area, a language continuum was formed from which the Indo-European language families all grew, dating back somewhere between the late Paleolithic to early Mesolithic eras. His evidence mainly stems from Hans Krahe's Old European toponym theory in which several river names dispersed from Great Britain to Russia appear to be cognates of each other; he felt they represented an early common IE continuum of river names. Häusler employed this theory to specify the original area of IE languages somewhere in between the North European Plain and eastern shore land of the Caspian Sea. It is on the northern European plain that he believes that the Celtic, Germanic and Baltic speakers emerged from the Funnel-necked Beaker (TRB) culture in an uninterrupted sequence from the culture's earliest appearance to the late Bronze Age. The Indo-Iranian speakers are said to have of their origins on the North Pontic Steppes from the Yamnaya culture in roughly the same temporal manner.

Häusler feels that such a theory is sound since it needs not invoke any specific archaeological culture or migration theory (which he feels are outdated) concerning warrior elites or agriculturalists. According to his logic, he also sees no reason to consider what linguistic paleontology has to say on the matter. All the sub-language families of the IE group simply sprang up from where they were. At the end he cites a hypothetical computational scenario conducted by a colleague as proof that such a model is feasible. Much of his writing also deals with pointing out alleged historical and archaeological problems regarding any existence whatsoever of nomadic pastoralism existing on the North Pontic Steppes c. 3500-3000 BC.

Since the spatial plausibility of a Near Eastern wave of agricultural advance and theories concerning notions of

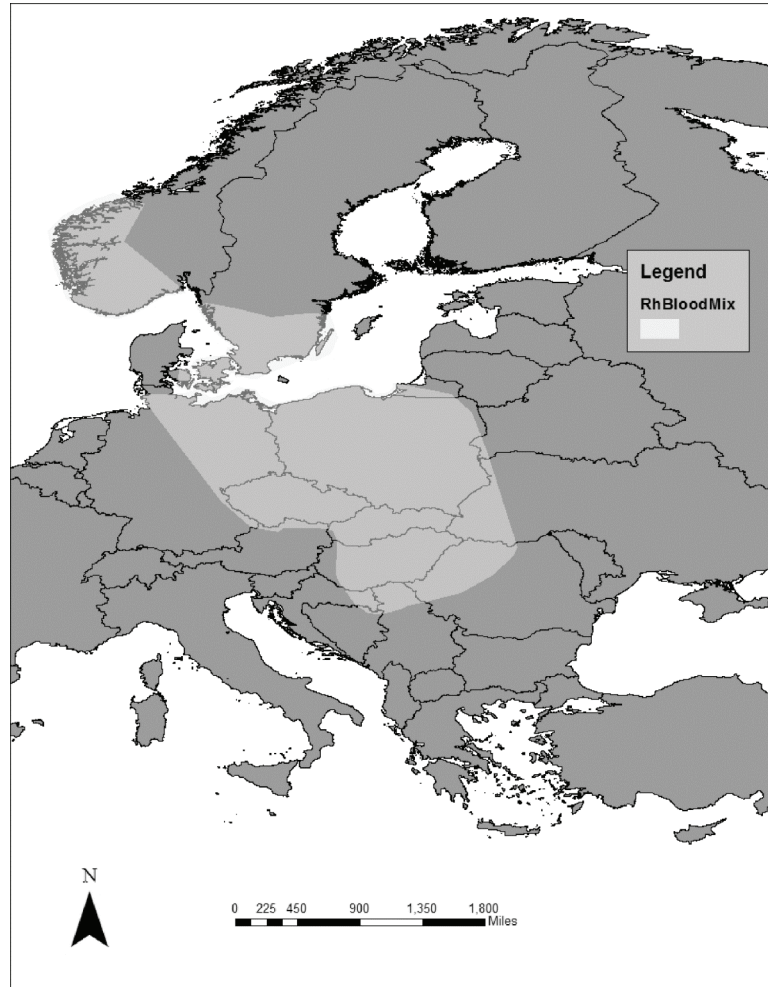
continuity from local sources have been discussed and tested elsewhere (see Krantz 1988 for a Near Eastern wave of agricultural advance, and Malmer 1962 for continuity from the TRB) it is thus solely the intent of this study to test for spatial correlation stemming from Eastern Europe and into Northern Europe. Two different models of how this may have occurred will be analyzed and discussed.

### **Research Methodology**

The North Pontic steppe region of Eastern Europe and the region extending west-northwest to and including southern Scandinavian was selected as the study area for the following reasons:

1. The North Pontic Steppe region is where the Kurgan culture and the Indo-European language first emerged according to the model proposed by Marija Gimbutas.
2. The area of northern and central Europe north of the Carpathian Mountains is where the Kurgan culture diffused. There, it is argued, it formed the culture defined as Corded Ware c. 3200-2800 B.C.
3. The Jutland peninsula as well as other parts of southern Scandinavia is the region where the bearers of the Corded Ware culture are believed to have migrated. Here they synthesized with the indigenous Nordic tribes, giving birth to the Proto-Germanic language.

ArcMap of the ArcGIS computer software was used to create a map of Europe showing the diffusion of the Kurgan culture into southern Scandinavia. A Moran's I spatial autocorrelation from Arctoolbox was run on the coordinate of the map's features after they were digitized and their attributes added. The utility and validity of ArcGIS has been substantiated through its use for over many years in the analysis of various geographic spatial problems. Misuse or misleading interpretations generated from the ArcGIS software can be avoided by finding data with exact coordinates already in GIS format or from reputable scholarly sources that use various topographic features to help pinpoint general locations of cultural, genetic, archaeological and linguistic areas.



*Figure 3.* Areal distribution of where Rh- and Rh+ blood types mix.

A base map of Europe from the 2003 ESRI CD package of world geographic data was used as the background layer in ArcMap. A layer of major rivers and country outlines from the package was overlaid on the base map of Europe to help establish boundaries when defining the various Kurgan waves of diffusion. Gimbutas' three waves of Kurgan diffusion map were also used as a data source.

After the ESRI data sets were added to the base map, the three Kurgan waves were digitized manually into polygonal

features and assigned time frames. Archaeological maps were also gathered showing the areal distribution throughout Europe of cultures regarded as Kurgan featuring major sites, settlements and graves, otherwise known as “find spots”. These were represented as a collective feature of point symbols belonging to several archaeological cultures. Stray finds of artifacts were not used. A major rivers layer in addition to a world .TIF map layer displaying topography (included with the ArcGIS 9.1 software package) assisted with the placement of these points.

Next, the points of these features were assigned coordinates. Finally, data from the work of Cavalli-Sforza et al. (1994) relating to geo-genetics in Europe were used to create a manually digitized feature displaying the areas of where Rh- and Rh+ blood frequencies were at roughly 50% each (Figure 3). It was overlain with the areas in which Kurgan waves and archaeological data were believed to have diffused into southern Scandinavia from the NPS in order to determine when and where the pre-Indo European and IE speaking populations first met and how this led to the formation of PG. Analysis of the data focused on the mapped areal extent of the Kurgan culture’s diffusion into Western Europe and southern Scandinavia from the North Pontic Steppes. Close examination was given to the areas where migration occurred, as indicated by the archaeological and geo-genetic records. The archaeological points corresponding to the Kurgan wave features created in the ArcGIS software allowed for a spatial statistical analysis to be performed.

The test conducted was a spatial autocorrelation (otherwise known as the Moran I) on two different elements of the problem relating to the subjects: Gimbutas’ model of Kurgan diffusion and an Alternate model of Kurgan diffusion. The number of observations is large in both cases. The large samples, justified the use of the normal distribution to test for significance. The significance level of .05 was selected. The critical values of the normal distribution for the level of significance are  $\pm 1.96$ . The null hypothesis to be tested is:

Ho: there is no spatial autocorrelation.

The Moran I score for each case was then standardized as a z score.

Decision rule: if  $z < 1.96$  or  $> -1.96$  accept Ho

if  $z > 1.96$  or  $< -1.96$  reject Ho

Finally an analysis of the geo-genetic Rh- blood feature layer was done to determine any spatial relationship to the Kurgan culture. If the data showed an Rh- presence in southern Scandinavia and an absence in Eastern Europe along with the Moran I test proving a spatial dispersion of a common Kurgan culture from the North Pontic steppes then this would allow for the acceptance of the main research hypothesis alternative stated above. All of these procedures were built into a model using ArcGIS (Figure 4).

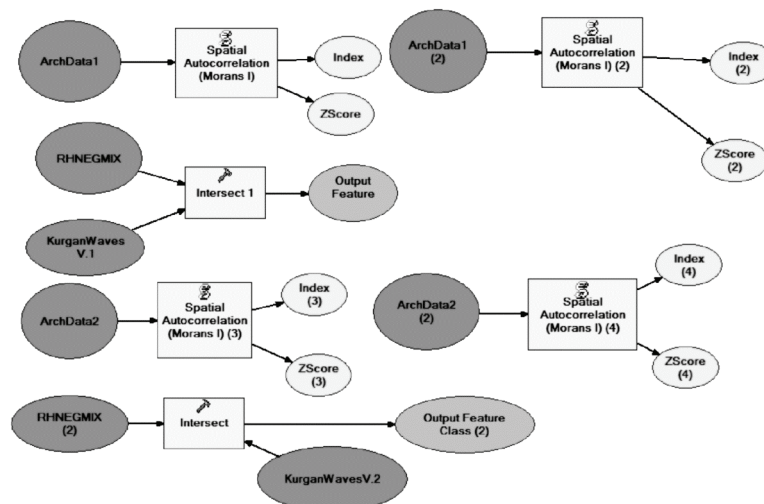


Figure 4. Model built in ArcGIS that was used for the procedure.

### Analysis of Data

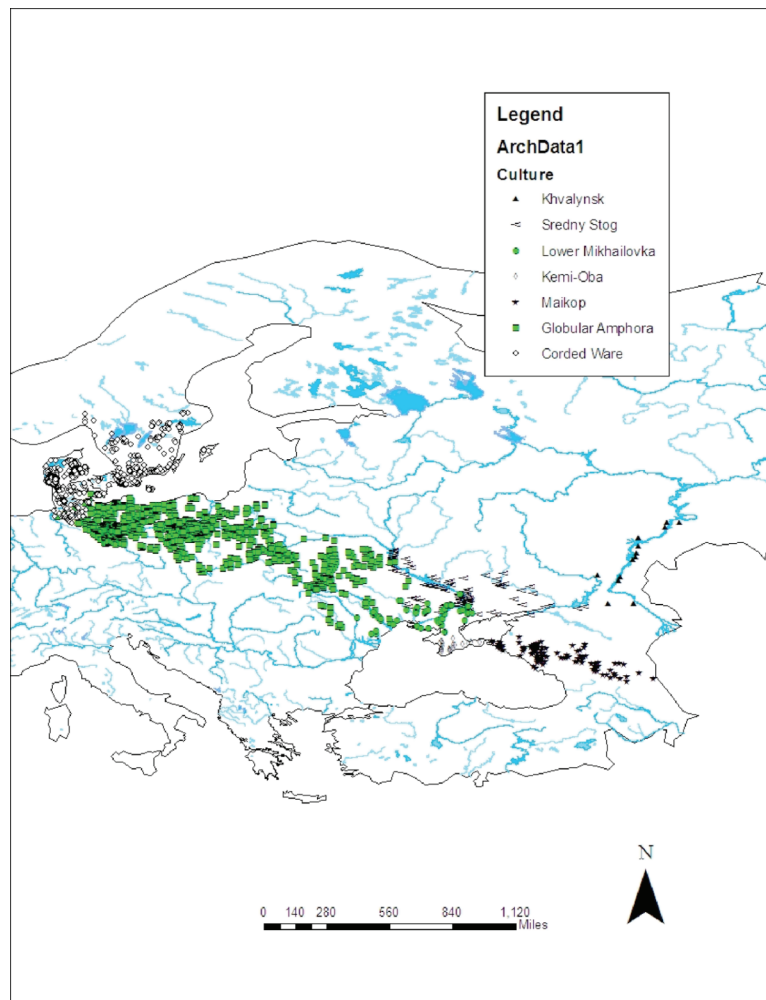
The area stretching from the NPS to southern Scandinavia is the primary geographic area of analysis. The Elbe River was used as an arbitrary cut off point for plotting migrations into southern Scandinavia, as it seems unlikely that the tribes moving west of it would later have the intent to move back eastwards and then north into the aforementioned area for settlement.

The archaeological data collected from secondary sources

were used to plot two versions of how the kurgan culture most likely diffused from the NPS: (1) Gimbutas' paradigm and (2) a synthesized alternate paradigm based on the research of several scholars (Sulimirski 1968, Buchvaldek 1986, Telegin 1992, Carpelan and Parpola 2000). In addition to archaeological data, geogenetic and temporal information were gathered as well. The geogenetic data entitled "RHMIX" shows where Rh- and Rh+ blood types are found at a roughly 50% frequency on the North European plain. This is believed to represent a mixture between Non-IE and IE speakers that first occurred sometime during the Neolithic. Justification partly stems from the fact that Rh- is found more in western Europe with highest frequencies among the Basque who are non-IE speaking people while Rh+ is found at higher frequencies throughout the rest of Europe (Cavalli-Sforza 2000). Cavalli-Sforza (2000) typically interprets this as Neolithic farmers from the Middle East integrating themselves among more indigenous Europeans from the west as a means to explain IE diffusion and origin in a manner similar to Gamkrelidze and Ivanov's (1995). However, there have been studies demonstrating that most of Europe is not genetically descended from Middle Eastern farmers during the Neolithic (Sykes 2001, The Genographic Project 2006). Genetic traits most associated with Middle Easterners are practically absent in Central and Northern European populations (The Genographic Project 2006). With this as well when taking into consideration that the polygon has a northern position and displays a distribution which is more east to west/north west oriented than south to north would most likely suggest a mingling between people from western European (Rh-) with people from Eastern Europe (Rh+) who either followed the Dniester river or Dnieper's Pripyat tributary into Central and then ultimately Northern Europe. Finally, the temporal waves added into the GIS, entitled "Kurgan WavesV.1" and "Kurgan WavesV. 2" were based on how Gimbutas believed the process occurred and how other scholars suggested, respectively.

As discussed, Gimbutas' Kurgan paradigm for the spread of IE speaking tribes into the North European plain is based on the premise that *c.* 3500 B.C., Yamnaya tribes from the upper reaches of the Volga River swept down into the southern part of the NPS and northern Caucasus pushing the Lower Mikhailovka-Kemi-Oba-Maykop community from its original

territory. The LMKO-Maykop cultural community moved westward and reestablished itself as the Globular Amphora culture on the North European Plain. The genesis for the Kurgan culture stems from the formation of the Khvalynsk and Sredny Stog cultures of the NPS. The cultures involved according to their chronological order of appearance are: Khvalynsk, Sredny Stog, Lower Mikhailovka-Kemi-Oba, Maykop, Globular Amphora, and finally the Corded Ware culture into southern Scandinavia (Figure 5).



*Figure 5.* General distribution of the archaeological sites under Gimbutas' model.

Many scholars do not agree with Gimbutas regarding the process of Indo-Europeanization of northern Europe. Alternate explanations of how Kurgan cultural elements made

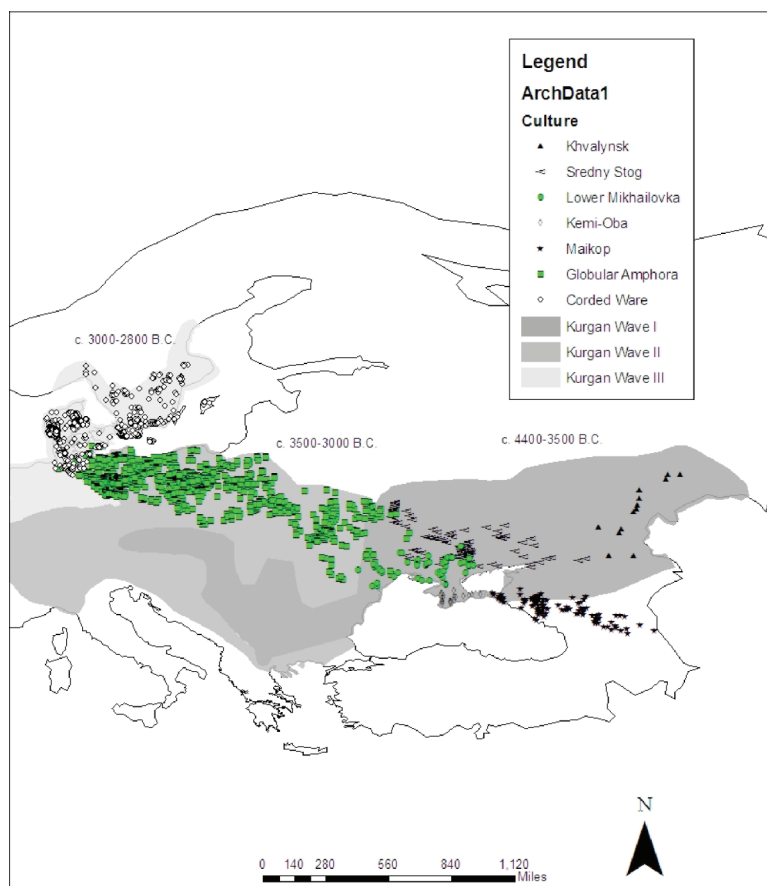
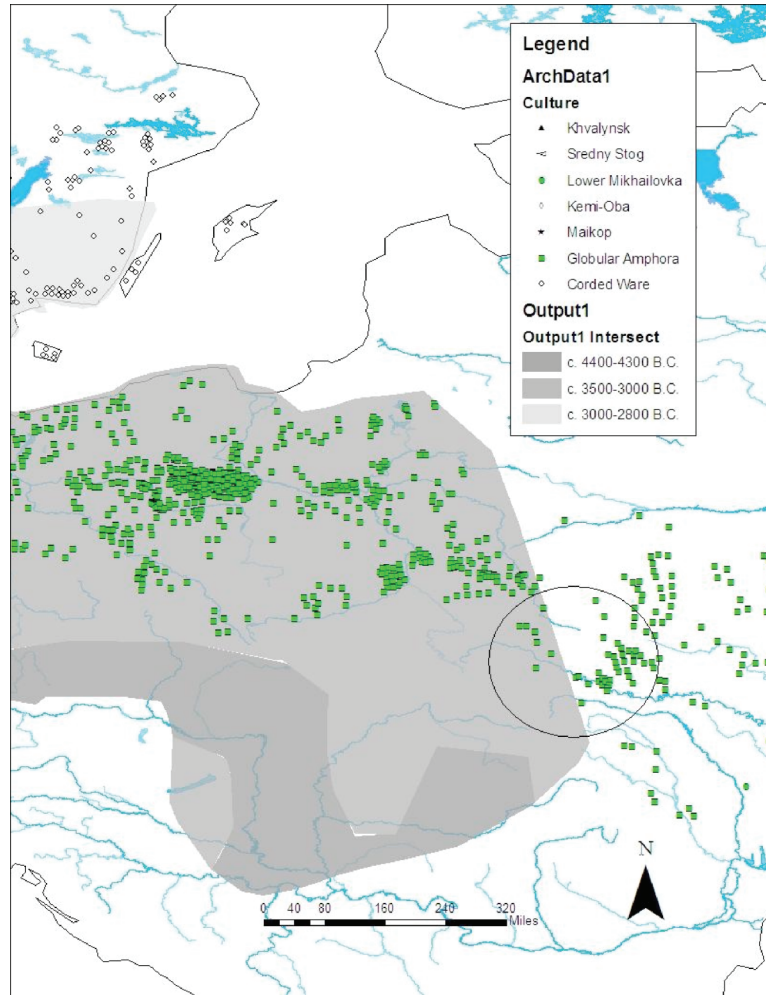


Figure 6. Temporal waves and archaeological cultures in accordance with Gimbutas' model

their way into central and northern Europe have been sought. Many with opposing views have centered the notion of Kurgan intrusion into the North European Plain and ultimately southern Scandinavia on Yamnaya tribes entering the region after a brief period of transition with other cultures along the Pripyat River. This in turn would have led to the formation of the Corded Ware culture (Sulimirski 1968, Telegin 1992). The initial formation of the Yamnaya culture stems from the Lower Mikhailovka, Sredny Stog, and Khvalynsk cultures. Similar to



Gimbutas' paradigm, the formation of the Kurgan culture on the NPS stems from the Sredny Stog and Khvalynsk cultures. The chronology of the alternate paradigm is as follows: Khvalynsk, Sredny Stog, Lower-Mikhailovka, Yamnaya, Middle Dnieper, Masovian, and finally Corded Ware (see Figure 6).



*Figure 7.* Circling area of where IE and non-IE tribes first met under Gimbutas' model.

After running a Moran's I test on the various archaeological data gathered according to how Gimbutas defined the spread of the Kurgan culture, the following index

scores were produced:  $x=0.40$  and  $y=0.33$ . The intersection of the Rh blood type mixed layer with Gimbutas' temporal waves of Kurgan diffusion layers indicates that the earliest meeting of IE and non-IE tribes would have taken place *c.* 3500 B.C. on the North European Plain towards the mouth of the Dniester River under a westward moving Globular Amphora culture with steppe origins (Figure 7). The process of Indo-Europeanization in southern Scandinavia would have taken place *c.* 3000-2800 B.C. under the guise of a northward migrating variant of the Corded Ware culture stemming from the GAC.

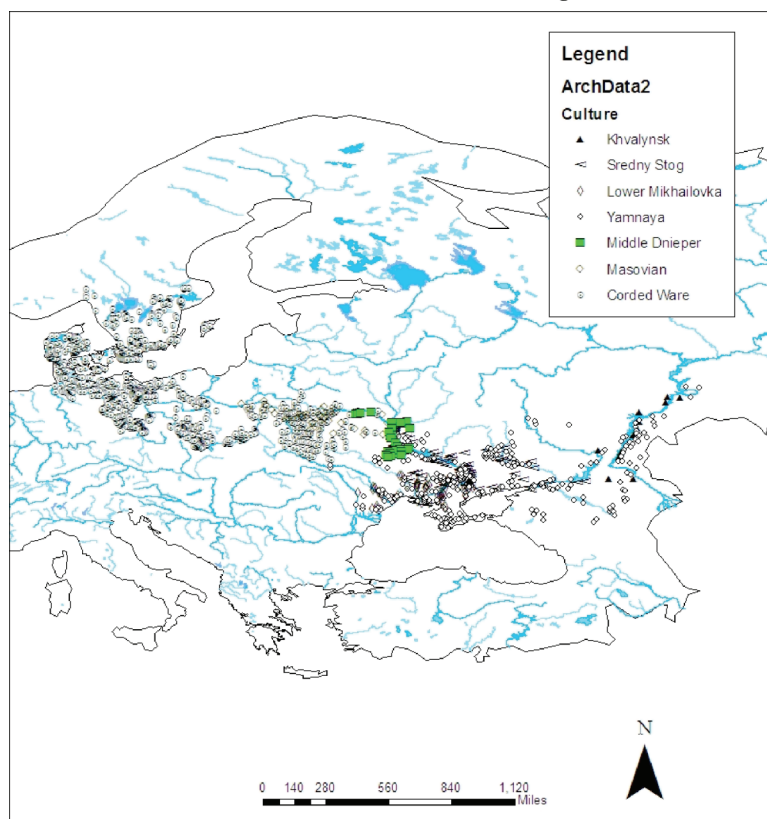
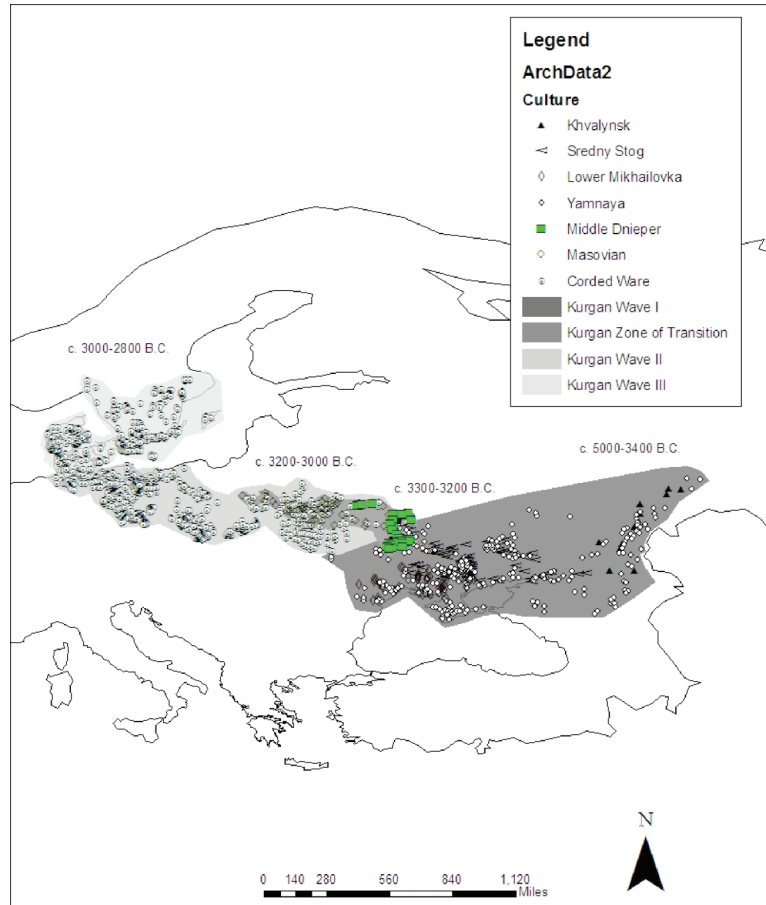


Figure 8. General distribution of the archaeological cultures of the Alternate Model.

This alternate version of the Kurgan culture's spread into the North European Plain opts for a push of Yamnaya tribes northwest along the Dnieper's Pripyat tributary (Figure 8).



*Figure 9.* Temporal waves and archaeological cultures according to the Alternate model.

Around the area of the middle Dnieper, a local variant of the Yamnaya culture separates from its greater cultural horizon and begins to develop into the Middle Dnieper culture (Telegin 1992). From there, this culture moves farther north and west along the Dnieper and Pripyat respectively where they come in contact with the local Masovian culture. There, they pick up local cultural variants most associated with aspects of the North European Plain cultures (i.e., perhaps elements of Funnel-necked Beaker and Globular Amphora). Eventually, all this leads to the formation of the distinctive pottery type of the Corded Ware culture in what this study terms a “kurgan wave of transition” (Figure 9). Along with the practice of kurgan

burial, this culture eventually overwhelms the entire North European Plain and southern Scandinavia.

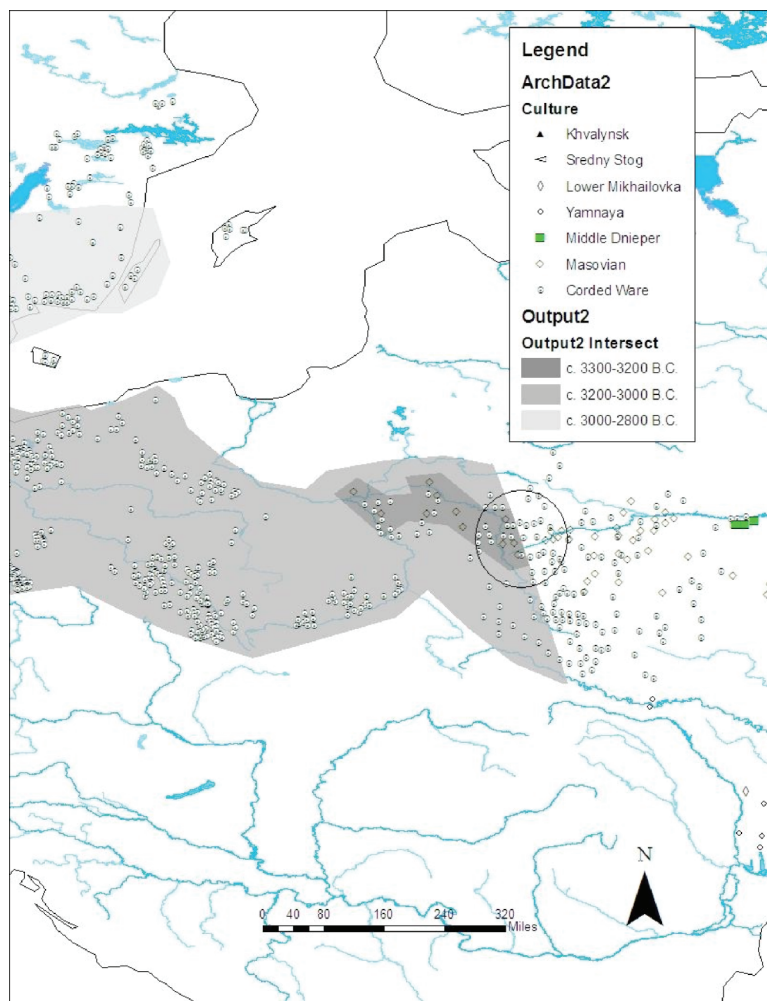


Figure 10. Circled area of where IE and non-IE tribes first met within the Alternate model

The results of the Moran I index scores were as follows:  $x=0.59$  and  $y=0.54$ . The intersection of the geogenetic data with “Kurgan Waves V.2” suggests that the first meeting between IE and Non-IE speakers occurred *c.* 3300-3200 BC at the mouth of the Pripyat along the present day border of Ukraine and Poland. Around 3200 BC the earliest variant of

the central European CWC appears in south-eastern Poland and from there expands nearly simultaneously to the Netherlands and Baltic territory by 3100 BC (Figure 10). After roughly a hundred years of inactivity, the CWC then moves into southern Scandinavia.

### **Summary of Findings**

Gimbutas' paradigm describes an initial meeting between non-IE speakers and IE speakers first occurring *c.* 3500 BC towards the mouth of the Dniester River under the guise of the Globular Amphora culture (GAC) which eventually spread into central Europe, in turn giving rise to the Corded Ware culture (CWC) which would later enter southern Scandinavia. The Moran's I test produced z score's in the rejection zone of the null hypothesis at the 0.5 alpha level, which would lead to the acceptance of Gimbutas' hypothesis regarding the manner in which the Kurgan culture spread into northern Europe, i.e., there is a high degree of spatial autocorrelation of the mapped feature.

As for the alternate model, the initial meeting between IE and non-IE speaking tribes would have occurred *c.* 3300-3200 at the mouth of the Pripyat. The Moran's I of 0.5 produced a z score that rejected the null hypothesis. The alternate model's hypothesis was accepted as well, i.e., that ultimately there was a common Kurgan culture with origins lying on the NPS that eventually made its way into Northern Europe. This is in full accordance with the qualitative data that many archaeologists have presented over the years. Although the test for autocorrelation for both the Gimbutas and alternate models led to the conclusion that there was definite clustering of features (i.e., not a random pattern), the scores for the alternate model were higher and reflect a stronger pattern of clustering.

Significance of Moran Test  
 $\alpha=.05$

	coordinates	n	Moran I	z-value	critical values	Decision
Gimbutas Model	x	1868	0.39	147	(1.96, -1.96)	accept
	y	1868	0.32	123	(1.96, -1.96)	accept
Alternate Model	x	1818	0.59	183	(1.96, -1.96)	accept
	y	1818	0.54	169	(1.96, -1.96)	accept

Based upon the findings within the limitations of this study, the formation of the Proto-Germanic language could have occurred via a process of Indo-Europeanization attributed to the CWC variant of the Kurgan culture *c.* 3000-2800 BC in southern Scandinavia. This process involved the coming together of an indigenous non-IE branch of speakers located in southern Scandinavia and IE speakers with origins from the NPS. The greater score of .59 on the x coordinate in the alternate model suggests a stronger likelihood that this is the process by which Kurgan tribes made their way into central and ultimately northern Europe. This is not surprising since the alternate model demonstrates a classical invasion route into Europe along the Pripyat River. This was the route taken by the Mongol Golden Horde into Europe as well as when Napoleon marched his Grand Army eastward into Russia. In contrast the Gimbutas model suggests an invasion route into central Europe via the Dniester that is spatially and historically unlikely.

Archaeologists (Wisłanski 1970, Szmyt 1996, Mallory 1997) have been reluctant to accept Gimbutas' model revolving around the notion that Yamnaya tribes indirectly caused kurgan expansion into central and northern Europe by forcing the people of the Maykop culture and Lower-Mikhailovka-Kemi-Oba group (LMKO) to migrate into the North European Plain and thus reestablish themselves as the GAC. Even more problematic were her interpretations of the GAC, which completely ignored the regional chronology of the culture in question as well as the intricacies of the material items and mortuary practices. As Wisłanski pointed out, the main contributor of the GAC was the Funnel-necked Beaker

culture (TRB). The oldest GAC sites are found in central Poland. The same also applies for the TRB roughly 1000 years before the advent of the GAC (Midgley 1992). What the scores indicating high clustering for her model most likely mean is that there was influence or interaction between the GAC among the various cultures that she felt constituted Maykop. A wholesale migration by the people inhabiting the southern areas of the NPS in central Europe is still very questionable.

The development of the GAC in central Poland suggests that this was an area of innovation for the tribes of the North European Plain dating back to the beginnings of the TRB. What caused the decline of the TRB in central Europe was not the invasion of IE-speaking steppe tribes, but rather the inability of this early farming culture to practice sustainable growth. As Magdalena Midgley explained in her book *The TRB Culture: the First Farmers of the North European Plain* (1992), the TRB's demise was one of self-causation. They simply over farmed the land and were forced to switch to pastoralism.

It is in this context that the GAC developed out of the TRB *c.* 3400 BC. This culture defined primarily by a new economic mode of production proceeded to expand eastward. It is here where they entered the steppes of Ukraine in an eastern exodus *c.* 2900 BC. This is substantiated by radiocarbon dating of GAC artifacts in this area. All of this is opposed to what was occurring on the NPS where innovation was typically moving from east to west dating back to *c.* 6000 BC.

The premise that the CWC evolved from the GAC and ultimately the TRB directly cannot be accepted. There are absolutely no grounds for a direct continuance from the TRB in central Europe according to temporal as well as archaeological evidence (namely in burial rite while some pottery types resemble those of both the TRB and GAC). This is due to the fact that the GAC is the succeeding culture to the TRB.

This brings us to another problem with Gimbutas' Kurgan model. It fails to clearly and effectively address the fact that the CWC eventually overwhelms not only the entire territory of the North European Plain but also the GAC. Instead, she proposed that the GAC gave birth to the CWC as to explain why elements of the CWC are found in the GAC. The intermingling of CWC and GAC artifacts can be explained as

follows: by 3400 BC the people of the TRB in central Europe had switched from agriculture to pastoralism brought on by deteriorating environmental conditions somewhat self-induced, yet they maintained a communal burial tradition. The culture is now the GAC as evidenced by a new pottery type though with firm links originating in the TRB. Most of the faunal remains are of various stock animals, though the domesticated horse is relatively rare (Szymt 1996). Wislanski remarked that only in exceptional cases were horse remains found in graves, which indicates some cultic role (1970). Eventually, more obvious IE elements appear in the culture particularly sun discs representing the sky god and other CWC artifacts.

This suggests that the GAC embraced the incoming CWC due to the introduction of the domesticated horse. When the GAC people saw the horses of the CWC, they realized that these animals could be advantageous to their newly adopted mode of production. The people of the CWC who descended in part from the Yamnaya steppe tribes had been practicing mobile pastoralism longer. Warring with them would not have made much sense not only due to the fact that the CWC was a more aggressive tribal force but also because the GAC could learn from them. The CWC most likely possessed a far superior knowledge of pastoralism than the GAC. As a result, whatever aspects of the CWC that could be adopted were accepted into the GAC. This would have included technology (namely the horse), religion, and ultimately language. In roughly 100-200 years though, the GAC of central Europe was completely absorbed by the CWC. The people of the GAC became the first Indo-Europeanized population of the North European Plain through a relatively peaceful process. The story is quite different however in southern Scandinavia.

In Denmark, the TRB did not cease *c.* 3500 BC as it does in most of central Europe, but continued until *c.* 2650 BC (Midgley 1992). Agriculture, in addition to hunting and fishing was still being practiced. Eventually, by *c.* 3000-2800 BC the CWC entered Denmark, southern Sweden, and southeastern Norway. Here it encountered a thriving culture rooted in local economic practices and communal burial rites. Although there is no evidence for the domesticated horse to be found within the initial wave of Scandinavian CW cultures, most Scandinavian archaeologists interpret this as failure of



uncovering sites where remains most likely are. The archaeological picture painted by Davidsen (1978) seems to suggest two different ethnic groups in opposition to one another. Though others, influenced by Malmer, have suggested that the two cultures represent continuity. Given what happened in central Europe, this notion should be disregarded.

Of importance here is the notion of Gimbutas' peaceful matri-focal mother goddess culture of "Old Europe". While it seems plausible that the concept of female spiritual entities of love and fertility made their way among the farmers of the North European plain from possibly southern farming cultures often associated with the Near Eastern wave of agricultural advance (namely the Linear Ware culture and Tripolye both of which influenced the TRB to varying degrees, see Midgley 1992), it is doubtful that they were a completely peaceful people. The archaeological presence of stone battle-axes found in the TRB and the non-IE term for "troop" (*druht*) suggest a partly militarized society. Ultimately, this brought the two ethnically different people of the TRB and CWC together as one to form the Proto-Germanic language.

Finally the geogenetics of Denmark must be addressed. Cavalli-Sforza's data on the surface would suggest that there does not appear to be a mixture of IE and non-IE speaking tribes in Denmark based solely on Rh blood types. However, there is a significantly high frequency of the R1b haplogroup at 36.1% (Tambet et al. 2004). This lineage is mostly associated with the non-IE speakers who migrated out of Iberia and populated much of Europe (Wells 2002). Since the archaeology of southern Scandinavia indicates a major entrance of hunters and gatherers *c.* 12000 BC (Tilley 1996) it could be inferred that this is when the bearers of the R1b lineage first began to significantly settle the area. R1a, which has been identified to correspond with the diffusion of the Kurgan culture (Wells 2002), is found at frequencies of 16% (Brion et al. 2004, Tambet et al. 2004) mostly in the southeastern region of Jutland. The distribution of R1a and R1b in Norway and Sweden is at nearly equal frequencies: Norway: 23.6% R1a and 27.8% R1b compared to Sweden: 18.4% R1a and 22% R1b (Tambet et al. 2004). This may seem to suggest why Rh- and Rh+ are nearly half and half in Sweden and Norway. However, no data were provided by Cavalli-Sforza

(et al.1994) showing the frequency levels of Rh- and Rh+ blood types in Denmark. This is why it is important to address the frequencies of haplogroup markers associated with non-IE and IE speaking populations in Denmark to demonstrate IE invasion on the grounds of geogenetics.

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