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**THE HUNS IN SCANDINAVIA: A NEW APPROACH CENTERED  
AROUND MODERN DNA****Karl O. Högström<sup>1</sup>**

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**Abstract.** Several scholars have in the past hypothesized a northward movement of Hunnic contingents which ultimately reached Scandinavia on the basis of archaeological and philological evidence, an event which should be detectable in both ancient and modern DNA if true. Here I report that when analyzing a combination of ancient and modern DNA samples from across Eurasia one can detect a westward movement from the Altai-Sayan region to Europe which ultimately reached southern Sweden, and also accurately date this migration event to the 4<sup>th</sup> and 5<sup>th</sup> centuries CE with the help of carbon-14 dating and estimated TMRCAs of certain Y-DNA lineages. It is possible to identify these individuals and groups as Huns by analyzing their Y-chromosomal and autosomal DNA in combination with burial context. The significance and implications of this become clear when looking at the philological evidence which suggests that the Huns had a formative and lasting impact on the development of the peoples, cultures and beliefs of Scandinavia

**Keywords:** *Attila, Huns, Scythians, Y-DNA, Xiongnu*

In 2007, Lotte Hedeager published an article in the Norwegian journal *Norwegian Archaeological Review* about Hunnic presence in Scandinavia that prompted Ulf Näsman to publish an article in the Swedish journal *Fornvännen* in 2008 where he argued against Hedeager's hypothesis. This triggered a reply by Hedeager in *Fornvännen* the same year that Näsman in turn replied to in the same journal the following year. In 2011, Hedeager published a book titled *Iron Age Myth and Materiality: An Archaeology of Scandinavia AD 400–1000* where she further developed her hypothesis. Hedeager (2007, p. 1, 2011, p. 203) argues, among other things, that the customs practiced by the equestrian elite in Sösdala and Fulltofta in central Scania during the 5<sup>th</sup> century CE are indicative of Hunnic presence in southern Scandinavia.

In 2017, Näsman and Charlotte Fabech published a book titled *The Sösdala Horsemen: and the Equestrian Elite of Fifth Century Europe* where they present the accumulated knowledge so far regarding the cultural horizon known as the Sösdala style. In the final chapter, Fabech and Näsman (2017, pp. 339–341) present a fictional narrative constructed around local warriors who travel to southeastern Europe where they are

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<sup>1</sup> I want to thank Peter B. Golden and Trygve Mathiesen for taking the time to read and critique this paper, and Borbála Obrusánszky for her unwavering support.

introduced to steppe nomadic customs which they bring back to central Scania. However, the authors (Fabech, 2017, p. 54; Fabech & Näsman, 2017, p. 343) simultaneously describe the archaeological finds from central Scania and the context to which they belong as foreign, and that this cultural phenomenon seems to lack local roots, which arguably contradicts their local origin hypothesis.

In the 5<sup>th</sup> century CE, a cultural shift takes place in Scandinavia where eastern influences become detectable in the material culture (Hedeager, 2007; Hedeager, 2011). One example is a new ornamentation style centered around animals and shapeshifting whose origins can be traced back to a steppe nomadic context (Hedeager, 2007, p. 46; Hedeager, 2011). Another example are the equestrian artefacts from central Scania that were ritually destroyed and deposited according to Hunnic customs (Görman, 1993, pp. 276–277; Hedeager, 2007, p. 1, 2011, p. 203; Fabech, 2017, pp. 46, 55). These cultural phenomena coincide with a shift in the military organization towards an emphasis on mounted warriors which Hedeager (2007, p. 51) argues all in all should be attributed to Hunnic presence in Scandinavia.

If Hedeager is correct, one would expect to find evidence of gene flow from the East in modern Scandinavians. Furthermore, one should also be able to date this gene flow to the Migration Period, i.e. 375–568 CE, for it to serve as evidence. I would argue that such evidence exists in the form of Y-DNA and autosomal admixture. My statement is based on inside knowledge acquired from working as an administrator of group projects linked to FamilyTreeDNA (Ćwiklak & Högström, 2024; Högström, 2024a, 2024c). In this paper, I will use genomic data from modern and ancient DNA in combination with carbon-14 dates, TMRCA estimates, archaeology and philology to argue that the modern distribution of certain Y-DNA lineages suggest that a northward migration was undertaken by heterogeneous Hunnic contingents during the 5<sup>th</sup> century CE which ultimately reached southern Sweden, and that they should be associated with the spread of the Sösdala style.

## Methods

The methods used in this paper are centered around dating certain phenomena, namely carbon-14 dates of historical human remains and estimated TMRCA dates of certain Y-DNA branches detected among both historical and modern individuals, and how these phenomena correlate with one another as well as with other phenomena such as autosomal admixture, material culture and burial context. The carbon-14 dates referenced in this paper come from already published scientific papers. The TMRCA dates, i.e. time to most recent common ancestor, referenced in this paper have all been calculated and published by FamilyTreeDNA (FTDNA, 2024a). The reason for using divergence and coalescence (TMRCA) dates estimated by FamilyTreeDNA is due to their large database of both historical and modern DNA samples, and the ability to easily access and verify the results via their Time Tree and Public Y-DNA Haplotree (FTDNA, 2024a, 2024b).

There are other similar methods that will render similar TMRCA dates. One such method is described in a paper from 2021 by Iain McDonald titled *Improved Models of Coalescence Ages of Y-DNA Haplogroups*. One can take the Y-chromosomal data generated from historical and modern DNA samples published by scientific papers,

FamilyTreeDNA and other sources, and use McDonald's method to calculate TMRCA dates that will resemble those calculated by FamilyTreeDNA, and by doing so, verify the validity of the TMRCA dates provided by FamilyTreeDNA. However, TMRCA's are just time estimates, not exact dates, and tend to fluctuate slightly as new samples are added to the tree.

I would recommend that readers of this paper use FamilyTreeDNA's Time Tree in tandem with the archaeogenetic papers also referenced in this paper since the latter rarely contain detailed analyses of Y-chromosomal DNA. Another reason is that the APA citation format does not allow for detailed references about individual DNA samples since it would make the in-text citations too long and the paper difficult to read. One can, therefore, use the Time Tree to look up specific Y-DNA branches and samples referenced in this paper, and then read the metadata about various samples on that branch in the Time Tree. In this way, the reader gets a better overview and can more easily detect the patterns highlighted in this paper.

## Results

In human genetics, a Y-DNA haplogroup and its subbranches are defined by mutations known as single-nucleotide polymorphisms (SNPs) in the non-recombining DNA of the Y chromosome. SNPs are unique to specific patrilineal branches and can, therefore, be used to track human migrations. The Huns in Europe mainly belonged to subbranches of Y-DNA haplogroups Q and R such as Q-M25, Q-L330, R-Z93 and R-PH155 which they had mainly inherited from their Scytho-Siberian forefathers via western Xiongnu groups. The western Xiongnu groups over time acquired a high amount of East Eurasian admixture, seemingly mediated by females from eastern Xiongnu groups who unlike the western groups mainly carried Ancient Northeast Asian (ANA) ancestry (Jeong et al., 2020; Lee et al., 2023). It was these ANA-enriched western Xiongnu groups who later became the backbone of the Huns. Some of the leading clans of the Huns (Maróti et al., 2022, VZ-12673) belonged to the same R-Z93 branch as the early Scytho-Siberian elite from Arzhan (Unterländer et al., 2017, I0577; FTDNA, 2024a). Furthermore, a supposed Xiongnu chanyu (DA39), i.e. a high king, from Arkhangai, Mongolia, belonged to a R-Z93 branch nowadays only present in Poland and Sweden (Damgaard et al., 2018b; FTDNA, 2024a).

The Q-M25-derived branch Q-YP789 has been detected in two Hunnic samples from Berel, eastern Kazakhstan, dated to the early 300s CE (Gnecchi-Ruscone et al., 2021, BRE004, BRE011; FTDNA, 2024a). One of these men was buried with a type of composite bow that is typically associated with the Huns (Gnecchi-Ruscone et al., 2021). Q-YP789 is present at a frequency of 4–5% among the Székely (Long & Fehér, 2024a, 2024b) in Romania, a Hungarian ethnic subgroup, who claim to descend from the Huns (Neparáczki et al., 2019, pp. 3–4). Q-YP789 is also present in Hungary, Poland, Russia and Kazakhstan (Ćwiklak & Högström, 2024; FTDNA, 2024a). The Székely, and Hungarians at large, are genomically fairly similar to their European neighbors (Fóthi et al., 2020, p. 2). In the case of the Székely, there is little evidence to support their claim regarding Hunnic descent except for the fact that some of them belong to Q-M25 and R-Z93 (Fóthi et al., 2020, p. 16; Ádám, et al. 2022, pp. 7–8; Ćwiklak & Högström, 2024;

Long & Fehér, 2024a, 2024b).

Most myths and legends usually contain at least a kernel of truth. For there to be a continuation of identity, there must be some type of genetic continuity however small it may be, and it is usually patrilineal in nature. The TMRCA of Q-YP789 is dated to c. 100 CE (FTDNA, 2024a) which indicates that its MRCA, i.e. most recent common ancestor, flourished within a Late Xiongnu context. Q-BZ1000 is located downstream of Q-YP789 and the TMRCA is dated to c. 300 CE (FTDNA, 2024a). All the Székely and Polish samples except for a Szlachta family (nobility) from Poland have tested negative for Q-BZ1000 (Ćwiklak & Högström, 2024). Q-BZ1000 is also present in Russia and Kazakhstan, and the former are all ethnically Tatar (Ćwiklak & Högström, 2024). The other Polish samples have terminal SNP Q-BZ351, a subclade confined to Poland (FTDNA, 2024a). The presence of Q-BZ1000 and Q-BZ351 in Poland likely represent a remnant of Hunnic presence in these lands.

Both the modern and the ancient distribution of Q-YP789 and several other Hunnic Y-DNA branches corroborate Jordanes' (50.266 [Mierow, 1908, p. 84]) claim that some Huns remained while others fled east after the Hunnic Empire collapsed. Csáky et al. (2020, p. 4) analyzed seventeen male samples from Avaric elite burials and fourteen of those samples belonged to Y-DNA haplogroup N1a and two belonged to Q1, more precisely Q-YP789 (AC4) and Q-BZ93 (AC7) respectively (FTDNA, 2024a). The fact that Q-YP789 is twice as common as N1a among the Székely (Long & Fehér, 2024b, 2024b) along with the fact that the Székely claim Hunnic descent support the view that Q-YP789 and Q-BZ93 were Hunnic Y-DNA branches that were absorbed by the incoming Avars. Jordanes (50.266 [Mierow, 1908, p. 84]) states that some Hunnic groups settled in Romania after the fall of the Hunnic Empire that is the same lands where the Székely now live.

The process of weaker groups being integrated into steppe confederacies controlled by more powerful groups, and the former sometimes also adopting the identity of the latter, is best exemplified by the Q-L330 branch Q-BZ93 (BRE005) that first appears c. 200 BCE among the Pazyryk culture in Berel, eastern Kazakhstan (Gnecchi-Ruscione et al., 2021; FTDNA, 2024a). The Pazyryk culture were Scytho-Siberians/Sakas just like the Tagar culture in Khakassia and the Sagly/Chandman culture in Tuva and northwestern Mongolia (Linduff & Rubinson, 2022). Q-BZ93 reappears among a Hunnic sample (BRE013) from Berel dated to c. 200 CE (Gnecchi-Ruscione et al., 2021; FTDNA, 2024a). The Huns from Berel likely brought Q-BZ93 to Europe in 4<sup>th</sup> century CE because it resurfaces together with two other Hunnic branches, Q-YP789 and R-S15948, among Avaric samples from Szarvas, Hungary (Csáky et al., 2020, AC4, AC7; Maróti et al., 2022, SZRV-147, SZRV-168, SZRV-277; FTDNA, 2024a). It should be noted that one of the Avaric R-S15948 samples (SZRV-147) from Szarvas has terminal SNP R-FGC56440 and is closely related to an earlier Hunnic sample (VZ-12673) from Budapest, Hungary, with terminal SNP R-FGC56425 (Maróti et al., 2022; FTDNA, 2024a). Another illustrative example is Hajdúnánás, Hungary, where the Avaric samples belong to Q-YP789 (HNJ012) and R-PH155 (HNJ002), both Hunnic Y-DNA branches (Gnecchi-Ruscione et al., 2024, FTDNA, 2024a). The fact that the same R-PH155-derived branch, R-BY17637, that was detected in the Avaric sample HNJ002 from Hajdúnánás also has been detected in a Gepid sample (Veeramah et al., 2018, VIM2; FTDNA, 2024a)

indicate that core Hunnic groups remained in Hungary and elsewhere in Europe after the fall of the Hunnic Empire, and that these groups were later absorbed by other groups like the Gepids and the Avars. This is likely also the reason why the aforementioned Hunnic branch R-FGC56425 later reappears among the Magyars in Hungary (Maróti et al., 2022, HMSZ-88; FTDNA, 2024a).

A Hunnic sample (Gnecchi-Ruscone et al., 2021, BRE014) dated to the early 4<sup>th</sup> century CE from one of the elite burial mounds in Berel has terminal SNP R-BY172798 (FTDNA, 2024a). Another Hunnic sample (KRY001) dated to the mid-5<sup>th</sup> century CE from western Kazakhstan has the same terminal SNP (Gnecchi-Ruscone et al., 2021; FTDNA, 2024a). R-BY172798 and R-PH155 are nowadays present in Dagestan (FTDNA, 2024a) where the kingdom of the Caucasian Huns was located (Golden, 1992, p. 107; Gmyrya 1995). R-S15948, the sister clade of R-BY172798, is present in Russia, Kazakhstan, China, Türkiye, Hungary, Czechia, Jura (France) and Sweden (FTDNA, 2024a). In Russia, R-S15948 is exclusively found among the Tatars. The TMRCA of R-S15948 is dated to c. 50 BCE (FTDNA, 2024a). The TMRCA of its major subbranch R-S10438 is dated to c. 50 CE (FTDNA, 2024a) which indicates that also this branch flourished within a Late Xiongnu context. The Hunnic sample from Budapest (Maróti et al., 2022, VZ-12673) has terminal SNP R-FGC56425, a subclade of R-S10438, and its TMRCA is dated to c. 300 CE (FTDNA, 2024a). The same branch is also present in Jura, France (FTDNA, 2024a), an area that historically belonged to the Burgundian kingdom. The Hunnic branch R-FGC56425 may have become a Burgundian Y-DNA lineage after the Hunnic military campaigns launched against them in the 430s CE (Epitoma Chronicon, 1322 [Mommsen, 1892, p. 475]; Maenchen-Helfen, 1973, p. 83; Kim 2015, p. 80).

Another R-S10438-derived branch, R-Y38432, is present in Sweden, and its TMRCA is dated to c. 400–450 CE (FTDNA, 2024a). The fact that R-Y38432 is not present in continental Europe indicate that it was brought to Scandinavia around that time. Iain McDonald (personal communication, August 1, 2022) argues that “the breakup of R-S10438 seems to be the start of a mass expansion or migration of this super-family” and that “R-S10438 is the haplogroup that is historically most important in this recent sequence”. McDonald (personal communication, August 1, 2022) agrees with FamilyTreeDNA that the TMRCA of R-Y38432 should be dated to c. 400–450 CE. The accumulated data suggests that R-BY172798 and R-S15948 were brought to Europe by the Huns and that some of these Huns made it all the way to Scandinavia. This view is further substantiated by the presence of other R-Z93-derived branches in Sweden like R-Y56311, R-S10247 and R-YP5275 (FTDNA, 2024a). R-Y56311 is the parent clade of R-PRX4, the latter detected in a supposed Xiongnu chanyu (DA39), i.e. high king, from Arkhangai, Mongolia (Damgaard et al., 2018b; FTDNA, 2024a). R-PRX4 later shows up among the Avars (Maróti et al., 2022, KFP-30a; FTDNA, 2024a), likely mediated by the Huns. It should be noted that these R-Z93 branches are only present in southern Sweden, not in the rest of Scandinavia (Högström, 2024b).

Yet another Y-DNA branch that might be linked to Hunnic presence in Scandinavia is Q-L527, which nowadays is mainly found in southern Sweden. The closest related branch is the sister clade Q-FT377000 that has been detected among aDNA samples (RISE672) from southern Siberia attributed to the Okunev culture, and dated to c. 2,300–

1,950 BCE (Damgaard et al., 2018a; FTDNA, 2024a). The TMRCA of Q-L527 is dated to c. 1,700 BCE (FTDNA, 2024a). However, Q-L527 only starts diverging into multiple subbranches from the 7<sup>th</sup> century BCE and onwards, and one of these subbranches, Q-Y15684, is nowadays present in Ukraine and southern Russia (FTDNA, 2024a). This may indicate that the initial major diversification of Q-L527 should be attributed to a Scythian context. This view is substantiated by the fact that related Q1b2b branches have been detected among the Srubnaya-Alakul (Blöcher et al., 2023, B2B-1), the Tagar (Damgaard et al., 2018b, DA4), the Karasuk and the Wusun (Kumar et al., 2022, C1246, C3325) cultural horizons (FTDNA, 2024a), all Iranic-speaking steppe nomadic groups, the latter also allies of the Xiongnu (Kim, 2015, pp. 37–43). Q-L527 may equate to a faction of the Akatziri who were based in Ukraine and who were allies of the Huns (Kim, 2015, pp. 84–86). The Akatziri are referred to as both Scythians and Huns by Priscus and may partially derive from the earlier Agathyrsi (Maenchen-Helfen, 1973, pp. 431–438, 451).

The highest frequency and diversity of Q-L527 is nowadays found in Götaland, Sweden, which is also the region with the highest frequency and diversity of Y-DNA haplogroup I1 (Högström, 2024b). The latter was spread to other parts of Europe by I1-rich Germanic-speaking groups whose origins can in part be traced back to Sweden (Stolarek et al., 2023). One would therefore expect the geographical distribution of Q-L527 in continental Europe to somewhat match I1 which is not the case. One would also expect Q-L527 to be present among aDNA samples from Sweden and among I1-rich continental Germanic groups. However, neither is the case. Several unusual Y-DNA haplogroups have been detected among the I1-rich Goths which demonstrate that they had no issue with intermixing and integrating groups from diverse backgrounds (Stolarek et al., 2023). These facts combined indicate that Q-L527 was brought to Götaland after those processes had occurred. Furthermore, the distribution of Q-L527 mirrors the distribution of artefacts from the Migration Period attributed to the Sösdala style in both Scandinavia and in continental Europe.

The Q-Y15684-derived branch Q-BY106702 is present in Sweden and northern Poland but as two separate subclades that diverged during the Migration Period and which do not overlap geographically (FTDNA, 2024a; Högström, 2024a, 2024c). This indicates that their current distribution is due to events that took place during that time period. The same can be said about another subbranch, Q-BY103840, which is present in Sweden and western Germany, but as two separate subclades which do not overlap geographically and which diverged during the Migration Period, more precisely c. 400 CE (FTDNA, 2024a; Högström, 2024a, 2024c). Another subbranch, Q-FT192927, with TMRCA dated to c. 200 CE, is present in Hungary and the Balkans but not in Sweden (FTDNA, 2024a; Högström, 2024a, 2024c). These examples combined suggest that the bearers of Q-L527 migrated from and/or to Scandinavia during the Migration Period. Furthermore, a related Q1b2b branch, Q-BY66647, with TMRCA dated to c. 250 CE, and which diversified into multiple subbranches c. 400 CE, is present in western Germany (FTDNA, 2024a; Högström, 2024c).

The ethnolinguistic identity of Q-L527 is difficult to discern, but the fact that one of its subbranches, Q-Y16739, with TMRCA dated to c. 100 BCE, is present in Cagliari, Sardinia, is helpful since the history of Sardinia is well-documented by Roman

chroniclers (Francalacci et al., 2013, ERS256927; Francalacci et al., 2015, pp. 6–7; FTDNA, 2024a). Procopius (3.11.13 [Dewing, 1916, p. 105]) states that a Roman army that was sent to conquer the Vandalic kingdom in 533 CE contained four hundred Heruli and six hundred Hunnic mercenaries. A portion of the army was sent to Cagliari in 534 CE to conquer the island Sardinia (Procopius 4.5.1–2 [Dewing, 1916, p. 247]). It is possible that some of these soldiers were Heruli and/or Huns, and that this Y-DNA lineage derive from one of those soldiers or commanders, or alternatively from the Vandals or their Alanic allies. Procopius (6.15.1–4, 6.15.26 [Dewing, 1919, pp. 414–415, 420–421]) states that the Heruli migrated north to Scandinavia during the 6<sup>th</sup> century CE and settled next to the Gautoi, i.e. the Geats, in Götaland. The accumulated evidence suggests that Q-L527 either equates to a Scythian ally of the Huns or the Heruli, the latter also allies of the Huns (Kim 2015, pp. 127, 143).

## Discussion

Priscus (fr. 8 [Gordon, 1960, p. 91]) states that Attila's empire in the late 440s CE encompassed the whole of Scythia and the islands of the ocean, the former referring to the Pontic-Caspian steppe while the latter is thought to refer to Scandinavia that at the time was believed by the Romans to be a large island with other smaller islands surrounding it (Sinor, 1990, p. 189; Kim, 2015, p. 54). Jordanes (49.257 [Mierow, 1908, pp. 80–81]) states that the Huns and their allies referred to Attila as “the sole possessor of the Scythian and German realms”. Bede (5.9 [Sellar, 1907, pp. 316–317]) states that there were Huns living nearby the Old Saxons and the Danes in the late 7<sup>th</sup> century CE which arguably should not be taken literally but rather as reflecting a distant memory of the political landscape of the 5<sup>th</sup> century CE before the *Adventus Saxonum* (Campbell, 1995, pp. 123–124). Further evidence can be found in several contemporary Roman sources that mention Hunnic military campaigns along the Rhine in western Germany in both 430 CE (*Epitoma Chronicon* 1322 [Mommsen, 1892, p. 475]) and 436–437 CE (*Chronica Gallica A. CCCCLII* 118 [Mommsen, 1892, p. 660]). It should be noted that the Hunnic ruler Octar died in western Germany during the military campaign 430 CE (Maenchen-Helfen, 1973, p. 83; Sinor, 1990, p. 187).

According to *Widsið* (119–122 [Chambers, 1912, pp. 221–222]), wars were fought between the Huns and the Goths in the forestland near the Vistula. The forestland along the Lower Vistula in northwestern Poland was the birthplace of the Wielbark culture, an Iron Age archaeological complex associated with the Goths (Łuczkiwicz et al., 2021; Stolarek et al., 2023). In the 3<sup>rd</sup> century CE, the major part of the Goths migrated south but small pockets remained in the lands around the Lower Vistula until the 5<sup>th</sup> century CE (Pędziszewska et al., 2020, pp. 192–194). One such example is Pruszcz Gdański where a large settlement cluster of the Wielbark culture was still located during the first half of the 5<sup>th</sup> century CE (Pędziszewska et al., 2020, p. 193). The Huns in *Widsið* (119–122 [Chambers, 1912, pp. 221–222]) are referred to as Attila's host. This passage in *Widsið* along with Priscus' account indicate that Attila may have partaken in these northern expeditions before he and his brother Bleda took over the leadership in 434 CE, and that they made it to southern Sweden. The presence of the likely aristocratic Hunnic branches R-Y56311 and R-Y38432 in Sweden support this scenario.



The fact that Attila's son Ellac ruled the Akatziri in the late 440s CE indicates that Ellac was born before 434 CE. Attila is described around the same time by Jordanes (35.182 [Mierow, 1908, p. 57]) as having a beard sprinkled with gray which suggests that Attila had already reached a considerable age by then (Maenchen-Helfen, 1973, p. 198). When one takes into account that Attila and Bleda only were nephews of the previous co-rulers, Octar and Rugila, the logical conclusion is that the two brothers must have made a name for themselves already before 434 CE for them to be chosen as the next co-rulers. The way to make a name for yourself was to lead successful military campaigns. It is likely that Attila was a Hunnic provincial leader before 434 CE among the northern Germanic allies as indicated by the fact that both Priscus (fr. 21.1 [Blockley, 1983]) and John Malalas (Chronographia 14.10 [Jeffreys et al., 1986, p. 195]) refer to Attila as a Gepid Hun (Kim, 2015, pp. 84–87, 109). Perhaps Attila's bid for power was that he had won several impressive military victories in the North and that he expanded the zone of influence all the way to southern Scandinavia.

If Hunnic contingents were sent north towards Scandinavia, it is difficult to discern exactly who these people were, but it is likely that they contained both Hunnic and Germanic elements, and that they should be equated with the cultural horizon known as the Sösdala style. The Sösdala style is defined by ceremonial horse bridles and pelta-shaped pendants with stamp ornamentation that were ritually destroyed and deposited on ridges in Sösdala and Fulltofta in central Scania during the first half of the 5<sup>th</sup> century CE (Bitner-Wróblewska, 2017, pp. 259–261). Similar finds from eastern Europe are dated to the late 4<sup>th</sup> and the early 5<sup>th</sup> centuries CE (Tomka, 1987, pp. 156–161; Rodzińska-Nowak, 2020, pp. 389–390). The nature of these finds, the way they were deposited and the limited distribution of similar finds in Europe is according to Mogens Ørsnes (1993) an indication that these finds belong to a princely Hunnic context. An illustrative example are the artefacts from a princely grave in Jakuszowice, Poland, that contained items both in the Sösdala style and the Hunnic polychrome style (Rodzińska-Nowak, 2021, pp. 117, 119; Obrusánszky, 2023a, p. 777). It should be noted that the finds from Jakuszowice, just like the finds from central Scania, predates the reign of Attila (Rodzińska-Nowak, 2020, pp. 380–393; Rodzińska-Nowak, 2021, p. 119).

In the 5<sup>th</sup> century CE, the main route north seems to have run west of the Vistula through the lands previously dominated by the Przeworsk culture, i.e. the Vandals (Gralak, 2010, p. 63; Mączyńska, 2020, pp. 451–461, 466). Hunnic contingents would have used communication routes running through the Carpathian passes towards Jakuszowice which seems to have been a gateway community controlled by the Huns (Gralak, 2010, pp. 66–67; Rodzińska-Nowak, 2021, pp. 121–123). This view is substantiated by a burial from Przemęczany, only 20 km from Jakuszowice, and another burial from Czulice, only 32 km from Jakuszowice, which both contained an individual with an artificially deformed skull, the latter also determined to be a Hun by genomic analysis (Gralak, 2010, p. 65; Niebylski et al., 2024, pp. 4–5, 10–11). The burial from Czulice also contained a second individual, perhaps a servant judging by the lack of grave goods, whose genomic and isotopic (0.7114) signatures point to southern Scandinavia (Niebylski et al., 2024, p. 6). The fact that the Czulice burial is dated to c. 395–418 CE (Niebylski et al., 2024, p. 10) suggests that the Vandals who left this region and crossed the Rhine in 406 CE (Epitoma Chronicon 1230 [Mommsen, 1892, p. 465])

did so to escape the Huns (Kim, 2013, pp. 160–161). Furthermore, a Hunnic sword amulet from Rędzina, located northwest of Jakuszowice, seems to indicate a northward route west of the Vistula towards the southern Baltic coast (Gralak, 2010, p. 46).

Once these Hunnic contingents arrived at the southern Baltic coast, it is likely that some would have crossed the sea from the area around Koszalin via Bornholm to southeastern Scania while other contingents would have stayed behind. Pruszcz Gdański and Juszkowo are located east of Koszalin and likely correspond to the area around the Lower Vistula where clashes occurred between the Huns and the Goths according to *Widsið*, a notion supported by the find of a spatha sword of Asian type in Juszkowo which likely belong to the same Hunnic context (Machajewski & Schuster, 2020, pp. 357–358). It should be noted that both Pruszcz Gdański and Juszkowo are dated to the first half of the 5<sup>th</sup> century CE, and just like the sites in southern Poland, predates the reign of Attila (Machajewski & Schuster, 2020, pp. 357–358; Pędziszewska et al., 2020, p. 193).

Hoards with solidi from Bornholm resemble hoards from Slovakia and Hungary dated to the mid-5<sup>th</sup> century CE (Fischer, 2017, 2019), and may belong to the same Hunnic context. Similar finds have also been found in the area around Koszalin (Gralak, 2010, pp. 67–68). Sacrificed horse remains from the Migration Period have been found in Sorte Muld on Bornholm and in Vikhem in Scania. Similar horse sacrifices have also been found in Poland, Slovakia, Hungary, Romania and southern Russia, all attributed to a Hunnic context (Bóna, 1979; Mráv et al., 2021). Ole Klindt-Jensen (1957, 1959) and Marianne Görman (1993, pp. 287–290) argue that the horse sacrifice from Bornholm should be attributed to a Hunnic context since only the head, limbs and tail of the horse were preserved, a custom mainly practiced by the Huns. Görman (1993, pp. 276–290) further argues that the deposited horse tack from central Scania belong to the same Hunnic context, a view substantiated by the fact that the burial from Jakuszowice also contained a horse sacrifice and items in both the Sösdala style and the Hunnic polychrome style (Rodzińska-Nowak, 2021).

C-bracteate IK 386 (Hauck, 1986, p. 163) from a hoard in Wapno, northern Poland, bears a unique runic inscription that transliterates as “sabar” (Pesch, 2020, pp. 421–425). The hoard is dated to the beginning of the 6<sup>th</sup> century CE (Pesch, 2020, p. 422). There is no consensus regarding the meaning of this inscription (Pesch, 2020, p. 423). IK 386 is a bastard of a specific subgroup of Scandinavian C-bracteates that seems to have been manufactured locally (Pesch, 2020, pp. 421–425). The same thing can be said about C-bracteate IK 211 (Hauck, 1985, p. 277) from the same hoard (Pesch, 2020, pp. 421–425). A row of connected squares depicted on IK 211 has been interpreted as mimicking runic inscriptions on C-bracteates from Scandinavia (Pesch, 2020, p. 422). I would argue that these peculiarities regarding IK 386 and IK 211 could stem from these C-bracteates being manufactured and owned by an individual or group who did not speak a Germanic language as a first language.

I would further argue that the runic inscription on IK 386 could derive from the same root that gave rise to the ethnonym of the Sabirs. The Sabirs are mentioned in accounts from the 5<sup>th</sup> and 6<sup>th</sup> centuries CE as living east of the Don (Sinor, 1990, p. 200). Some historical chroniclers like Procopius (8.3.5 [Dewing, 1928, pp. 74–75]) refer to the Sabirs as Huns while other chroniclers refer to them as related to but different from the

Huns (Golden, 2013, pp. 49–55; Kim, 2013, p. 138; Obrusánszky, 2023b, pp. 10, 13). The same root seems to also be preserved in Sabar and Sabur/Sabir which both designate subsets of the Kyrgyz (Golden, 2013, p. 51 [note 18]). Omeljan Pritsak (1976, pp. 17–30) argues that the words Sabir and Xianbei have the same etymology. The Xianbei were rivals of the Xiongnu who supplanted the latter as the hegemonic power in Inner Asia during the late 2<sup>nd</sup> century CE (Ishjamts, 1994, pp. 151–152; Golden, 2013, p. 50). The Xianbei-Hun cultural-chronological horizon in Berel, dated to the 2<sup>nd</sup>–4<sup>th</sup> centuries CE, has analogies in southern Siberia and Mongolia (Gnecchi-Ruscione et al., 2021). The samples with Q-YP789 and R-BY172798 from Berel are designated as Xianbei-Hun because they belong to a group who carry both local Pazyryk ancestry and admixture from those regions (Gnecchi-Ruscione et al., 2021, p. 4). They align genomically with later Hunnic samples from western Kazakhstan, Hungary and Poland (Gnecchi-Ruscione et al., 2021, p. 4; Maróti et al., 2022, pp. 2860–2861; Niebylski et al., 2024, p. 6).

Some Xiongnu factions defected to the Xianbei in 91 CE and consequently adopted the Xianbei politonym (Vasjutin, 2003, p. 57), an event that coincides with the TMRCA of Q-YP789 (FTDNA, 2024a). The supposed connection to the Xianbei is supported by the fact that Q-YP789 was seemingly not present in Berel before the 2<sup>nd</sup> century CE. The accumulated evidence suggests that the bearers of Q-YP789 were a faction of the Xiongnu who defected to the Xianbei in 91 CE, but later joined those Huns who migrated west, perhaps due to linguistic and cultural ties. This view is supported by the fact that the entire Q-YP844 branch to which Q-YP789 belong is associated with the Xiongnu and the Huns (Damgaard et al., 2018b, DA54, DA74), and it is later mainly found among Turkic-speaking groups (FTDNA, 2024a). Ancient chroniclers associated the Sabirs with both the Huns and the Magyars. It should be noted that Q-YP789 was present among both these groups. Q-YP789 is nowadays also present in northern Poland and may derive from those Hunnic contingents who likely stayed behind.

My view is that the Huns contained both Sabir and Bulgar elements, and that the latter was a Hunnified mixed group (Maenchen-Helfen, 1973, p. 168), as implied by their politonym, who formed among the Huns in the Balkans as a mixture of steppe nomadic (Saag et al., 2024) and local elements (Veeramah et al., 2018), a view shared by Borbála Obrusánszky (personal communication, July 6, 2024). The fact that Q-YP789 (I2525) was present among the Bulgars proves the Hunnic connection (Lazaridis et al., 2022, FTDNA, 2024a). I-L621, a Y-DNA branch local to the Balkans (Karachanak et al., 2013), seems to have been common among the Bulgars, and some of its subbranches like I-FT87075 and I-Y91535 with TMRCA's dated to the 200s–300s CE are nowadays present in Sweden (FTDNA, 2024a). The social mobility among the Bulgars which enabled commoners who excelled on the battlefield to rise through the ranks may help to explain how I-L621 became prolific among the Bulgars (Maenchen-Helfen, 1973, pp. 199, 213 [note 80]). Some of the R-Z93-derived branches in Sweden (R-YP5275, R-S10247) and Bulgaria (R-YP5275, R-BY104501) may represent Bulgar branches (FTDNA, 2024a). The accumulated evidence indicates that both Sabir and Bulgar elements participated in the Hunnic expeditions that were sent north towards Scandinavia. It is more difficult to detect and trace Germanic Y-DNA branches that may have partaken in these Hunnic expeditions since they are more or less the same as the native Y-DNA branches.

One Germanic group that has not been tested so far are the Heruli. One possibility is, therefore, that the modern distribution of Q-L527 reflects their movements across Europe during the 3<sup>rd</sup>–6<sup>th</sup> centuries CE. Another possibility is that it reflects movements by the Heruli both as Hunnic allies and as an independent group. A bone piece from Scania, dated to the 5<sup>th</sup> century CE, contains a runic inscription that in part transliterates as “ek erilaz” meaning “I, the Heruli” (Düwel, 2001, p. 29). A spear head from Rozwadów, Poland, contains a similar runic inscription transliterated as “[i]k [e]rlas” accompanied by several tamgas (Garbacz, 2016). With that said, the most likely scenario in my opinion is that Q-L527 equates to a Scythian ally of the Huns, perhaps a faction of the Akatziri. It should be noted that some individuals with Q1 from southern Scandinavia have been shown to still carry a minor steppe nomadic signal in their autosomal DNA (Högström, 2024a).

Scholars like Lotte Hedeager (2011), Hyun Jin Kim (2015), Marianne Görman (1993) and John D. Niles (2016) argue that the Huns had a formative and lasting impact on the cultures, beliefs, rituals and arts of the Germanic peoples of the North, even Scandinavia. It is noteworthy that Attila and the Huns are mentioned in a multitude of local legends, epic poems and sagas from northern Europe, especially from Scandinavia (Hedeager, 2011), while there is not a single mention of Scythians, Sarmatians or Alans within this corpus in relation to Scandinavia. To argue with great confidence, as many scholars do, that there was no Hunnic presence in Scandinavia, and that the Sösdala style has no direct connection to the Huns, is questionable when one considers the fact that the equestrian artefacts from central Scania were destroyed and deposited according to Hunnic customs along with the fact that the emergence and disappearance of the Sösdala style coincides with the emergence and disappearance of the Hunnic Empire (Näsman, 2017, p. 119). The fact that Czulice with certainty can be attributed to a Hunnic context implies that nearby Jakuszowice as well as Sösdala and Fulltofta in Scania should be attributed to the same Hunnic context.

## Conclusion

In the past, a major obstacle when trying to map the distribution and spread of various Y-DNA branches was that the models were based on only a few ancient and modern DNA samples. Furthermore, the data generated from those samples were not detailed enough to conclude anything with great certainty. Nowadays, we have a fair amount of aDNA samples from across Eurasia with detailed genomic data. The same thing can also be said about modern DNA samples. This enables us to see patterns and to construct viable models, especially when used in combination with carbon-14 dates, TMRCA, archaeology and philology. The finds from Czulice, Jakuszowice, Juszkowo, Fulltofta and Sösdala and the presence of certain R-Z93- and Q-YP789-derived branches in Poland and southern Sweden suggest that a northward migration from southeastern Europe took place during the first half of the 5<sup>th</sup> century CE which ultimately reached southern Sweden. The fact that the archaeological finds from Jakuszowice, Fulltofta and Sösdala belong to a princely Hunnic context along with the fact that the finds from Jakuszowice contained items in both the Sösdala style and the Hunnic polychrome style indicate that these phenomena are interconnected. This view is further substantiated by the fact that

the Hunnic burial from Czulice also contained a Germanic individual with an isotopic signature equivalent to southern Scandinavia. The distribution of Q-L527 mirrors the distribution of the Sösdala horizon and both seem to have spread along a southeastern-northwestern axis within the same time frame as the Hunnic R-Z93-derived branches nowadays present in Sweden which indicate that Q-L527 belong to the same Hunnic context. However, it is less clear whether Q-L527 represents a Scythian or a Heruli component within the aforesaid context. The conclusion is that the accumulated evidence, when structured into a coherent hypothesis, creates a synergistic effect that supports Hedeager's hypothesis.

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