Vilnius University Press

Contents lists available at Vilnius University Press

Archaeologia Lituana
2022, vol. 23, pp. 34–52

ISSN 1392-6748 eISSN 2538-8738
DOI: https://doi.org/10.15388/ArchLit.2022.23.2

Re-considering Processual and Post-Processual Archaeology: Can a Historical Approach Help Nuance the Usage of aDNA and Archaeogenetics

PhD candidate **Adam Andersson**

Department of Historical Studies, Gothenburg University, Sweden
adam.andersson.2@gu.se

Abstract. This article addresses the question of the use of modern archaeogenetics, taking into account the history of the discipline of archaeology itself, and comparing the criticisms that processual archaeology received with the criticisms that are currently directed to the use of archaeogenetics and "new" scientific methods. This paper illustrates that there are several parallels between processual archaeology in the 1980s and the criticisms received by contemporary users of archaeogenetics. This can be seen by examining the criticism that both have received and are currently receiving. This article aims to stimulate discussion about how the discipline best applies these scientific methods which are being increasingly used. The paper likewise aims to add to the discourse on how the discipline of archaeology best moves beyond the current concept of mobility and how a historical approach can be useful. At the same time, the work tries to emphasize the importance of learning from the history of one's discipline and why it is worth taking history as a starting point.
Keywords: archaeogenetics, aDNA, critical historiography, mobility, processual archaeology, post-processual archaeology, history of archaeology.

Persvarstant procesinę ir poprocesinę archeologiją: ar gali istorinis požiūris turėti įtakos aDNR ir archeogenetikos naudojimui

Anotacija. Šiame straipsnyje nagrinėjamas šiuolaikinės archeogenetikos naudojimo klausimas, atsižvelgiant į archeologijos mokslo istoriją ir lyginant procesinės archeologijos kritiką su šiandienine archeogenetikos ir „naujų" mokslinių metodų taikymo kritika. Šis straipsnis iliustruoja keletą panašumų tarp XX a. devintojo dešimtmečio procesinės archeologijos kritikos ir tos, kurios sulaukia šiuolaikiniai archeogenetikos naudotojai. Tai galima matyti, nagrinėjant kritiką, kurios abi šios temos sulaukė anksčiau ir sulaukia iki šiol. Šiuo straipsniu siekiama paskatinti diskusiją apie tai, kaip disciplinos efektyviausiai taiko vis dažniau pasirenkamus mokslinius metodus. Straipsnyje taip pat siekiama papildyti diskusiją apie tai, kaip archeologijos mokslas analizuoja mobilumo sampratą ir kuo gali būti naudingas istorinis požiūris. Kartu straipsnyje stengiamasi pabrėžti mokymosi iš mokslo istorijos svarbą ir tai, kodėl verta imti istoriją kaip atskaitos tašką.
Reikšminiai žodžiai: archeogenetika, aDNR, kritinė istoriografija, mobilumas, procesinė archeologija, poprocesinė archeologija, archeologijos istorija.

Acknowledgement. I wish to thank Archaeologia Lituana for publishing my work and for having confidence in my research. I would also like to show my gratitude to the two reviewers who came with many insightful comments that only made the work better overall. Lastly would I like to give a loving thank you to my partner Ebba for all her support.

Received: 01/09/2022. **Accepted:** 07/11/2022

Introduction: Can a historical approach help archaeologists make full use of the present

As this paper is being written there is a shift taking place within the archaeological discipline, and individuals such as Kristiansen have begun debating if the discipline is experiencing a new scientific paradigm (Kristiansen 2014, 2019). There are now those who claim that these 'new' methods will entirely replace old practices and make them somewhat obsolete (Reich 2018). The field has over the last decade seen an upsurge of 'new' scientific methods and techniques, all of which enabled archaeologists not only to ask new important questions, but additionally to take a step back and return to old prehistoric events and obtain new, more accurate results. Archaeogenetics, aDNA, Big Data, and Strontium Isotope Analyses, are the best examples of these 'modern' research methods.

Obviously, it ought to be clarified that these methods are not 'new' in the sense that they have recently been discovered. Strontium as a method has been applied to help explain human mobility for a few decades now (cf. Price *et al*. 2004), and there have been past attempts to use genetics to the same end (cf. Cavalli-Sforza 1994), but they are new and improved regarding their accessibility, their accuracy, and the amount of information which is being created. Therefore, even if both strontium and genetics have played a part in the archaeological view on mobility and migration, it is only during the last few decades that they have become defining and major factor in our understanding of the Human past. For the remainder of this paper I will use the term improved scientific methods and 'new' methods interchangeably, and I will use it when discussing primarily aDNA and archaeogenetic. These improved methods have answered some decade-old questions which had haunted the archaeological discipline, such as the question if modern humans interbred with other archaic humans (cf. Reich 2018). It is safe to say that the change in the accessibility of these methods have radically and permanently changed the archaeological view on both mobility and migration. Nevertheless, this paper will be focusing on the improved methods involving archeogenetics.

Previously, archaeologists had to look for other ways to explain human mobility, both in their examinations of the material culture and with the use of techniques such as linguistics (cf. Anthony 1990; 2007; van Dommelen 2014; Anthony & Ringe 2015). Works written by Haak *et al.* (2015) and Allentoft *et al*. (2015), and Kristiansen *et al.* (2017) have caused large scale debate on the current development within the archaeological discipline. This debate is caused due to a sensation of fear, because even if these improved methods are highly advanced, the rhetoric within these papers show similarities with the early 20th century cultural-historical archaeologists such as Kossinna and Childe (cf. Kossinna 1911, 1919; Childe 1925, 1929, 1950, 1958). However, as archaeologists look to the future of the archaeological profession, it is important that they take a step back and consider the evolution of their own disciplinary history, and more importantly, what can archaeologists learn from taking a point of departure in past disciplinary developments. Since the inception of the scientific archaeology a few scientific paradigms have occurred, and the question then becomes, what is there to be learned comparing these shifts. The author of this paper believes that a historical approach allows for a unique vantage point, and it permits the archaeologist to view past events through a more nuanced lens.

Naturally, it should be stated early on that this paper is by no means a complete critique of the advancements being made by these methods, nor is this article a critique of those who make use of them, but it is the objective of this paper to try and further the discussion on the topic whilst simultaneously grounding the advancements in the historical context of the archaeological discipline.

The relevance of knowing one's own disciplinary history

The archaeological discipline carries a mixed legacy, both in terms of scientific discoveries, where the field has provided more insight to the history of our species than any other field. Through the usage of archaeology mankind has been able to see trends in the history of major cultural events such as the development of agriculture,

the rise and fall of cities, or the fall of major civilizations, and through this understanding it is possible to draw correlations between the pre-historic past and our contemporary society. As archaeologists and historians tend to say, those who cannot remember the past are condemned to repeat it, and through the learning from our past society can better prepare for the future. Thus, it is safe to say that had it not been for the creation of the archaeological discipline it is doubtful that we would have as extensive knowledge of our past as we currently possess.

However, this scientific knowledge has not been provided in a purely altruistic manner, and the archaeological discipline has, and continues to be used for sinister purposes by forces which reside on all sides of the political spectrum (cf. Trigger 1989; Hakenbeck 2019). During the 19th and early 20th century the discipline was synonymous with the notion of the nation state, and it worked as an instrument to help legitimize and to a certain degree create nations all over the world, all whilst remaining part of the political sphere (cf. Trigger 1989; Arnold 1990; Anderson 1991; Gustafsson & Karlsson 2011; Högberg 2013; Kallis 2014; Andersson 2019, 2020). Through the creation of a unified national history it was possible to unite people of similar ethnicity and of similar cultural background, via excavations, large-scale museum collections, and explanation of pre-historic sites archaeology could unite people who lived miles apart, and in return would the archaeologists be given the required funds to conduct their research and to further their understanding of the past. Naturally, with the benefits of hindsight it could be easy to frown on those early archaeologists and some of the research which they conducted, but such could likewise be said about any scientific discipline, what is important is to see these archaeologists through the lens of their historical context.

Yet, the most prominent and well documented misuses were those of the Third Reich, and its usage of Kossinna's 'culture-historical archaeology'. The archaeological discipline and Kossinna's theories of 'kulturkreis' (cf. Kossinna 1911, 1919) would unknowingly and unintentionally provide the necessary tools for Hitler's idea of a homogenous German-Aryan people, and it would give essential justifications for war and conquest of territories which supposedly belonged to pre-historic Germans (Trigger 1989, p. 164–165). It was not Kossinna's fault, and he should not be blamed for how his scientific studies were used. He was a product of his time, and he should be viewed as such. Yet, there is no getting away from the fact that his works were misused, and such is worth remembering. The horrendous misconducts of the early 20th century are something that archaeologists are still living with today.

Still, it is imperative to remember that the Third Reich were not the first to make use of the archaeological discipline to such ends, and they will not be the last. Therefore, it is important to keep in mind the development of the archaeological discipline, and to learn from its past transgressions, and for archaeologists to constantly be aware of what could possibly happen should they forget their own disciplinary history. Yet, there is a lot to learn from past historical events, and there is knowledge to be found in taking a point of departure in the history of one's own discipline, because without the historical context of the early 20th century, is it impossible to understand the rise of the 'New Archaeology' movement, and the 'processual archaeology' and possibly how to better make use of the data which is now being unearthed.

Aim and purpose of this paper

The main purpose of this text is to advance the discourse on past archaeological thought movements, and the aim is to highlight how the archaeological discipline easily adopts new practices, practices which later turn obsolete only to later be discarded, before potentially being picked up again. Therefore, the aim of this paper is to shed some awareness of how easily we archaeologists get carried away with our contemporary methods and technologies.

Thus, the objective of this paper is to further our contemporary understanding of the archaeological discipline. Through the examination of the critique given towards the processual archaeological thought movement and comparing it to the critique which is currently being given towards papers and studies which make use of archaeogenetics and other contemporary methods. The paper hopes to further our knowledge on the scientific

changes which are currently occurring within the archaeological field. This aim will be achieved by taking a step back and observing past archaeological thought movements and comparing them to contemporary ones.

Theoretical Framework and Methodology

Due to the nature of this paper, it takes its point of departure within Bhabha's theoretical framework of *the Third Space* (Bhabha 1994, 1996, 2004). Bhabha's theory is quite applicable in this case study since it permits one to take a stance in the socio-political environments in which the different texts were written, and in what period the different theoretical frameworks were created. Their society is the *Third Space,* and their papers are the results of the authors moving through these created spaces. Bhabha's theory is similarly applicable since it is created in a post-colonial world and is therefore anchored in our contemporary mindset, which will hopefully result in a nuanced take on the archaeological discipline. Thus, this approach could be applied to the analyzed data (Bhabha 1994, 1996, 2004). Naturally, it should be stated that this is only one of many potential approaches that could be chosen, yet it is the one which is the most relevant for this specific paper and the conducted research. The theoretical approach is thus based on the notion that each scholar, and each scientific approach is created because of various encounters, and these separate encounters create the *Third Space* in which their research is produced. These encounters could be those of scholars meeting one another, or scholars' encounters with the socio-political contexts of their day-to-day life.

Simultaneously, the paper depends on a point of departure in *Critical Historiography*, an approach which has been applied in several studies in different scientific disciplines for critical discussions concerning the development and the content of the discipline at stake (cf. Trigger 1989; Burns ed. 2006; Murray 2008; Jensen 2012). In archaeology the equivalent is studies within the framework of the 'history of archaeology' (cf. Trigger 1989; Gustafsson 2001). This approach is necessary because only through applying a critical historiographical lens it is possible to see connections, issues, but also possibilities which would have otherwise been lost unless a historiographical approach had been applied.

The paper approaches the material by applying a *Critical Discourse Analysis* (CDA). Through the usage of such methodology the paper interprets potential patterns, thus providing further insight on why academics chose to approach a material in certain ways, as well as understanding why specific conclusions might have been drawn, and to what purpose (cf. Mullet 2018). This methodology is valuable to the grand narrative of the paper since it provides a toolkit to further investigate the material. Thus, this theoretical framework and the methodology are required to observe and investigate the chosen periods, and the selected material.

Definition of what processual archaeology was and the historical context to the rise of it

Processual archaeology was an academic endeavor during the 1960s, which would get branded as the "New Archaeology". It was a thought movement which promoted logical positivism as a steering research philosophy, modelled on new scientific methods which they thought would be able to change the archaeological discipline's perception on how research should be conducted. There was now a fundamental belief that all the historical record could be interpreted and understood (Trigger 1989, p. 294–295). This new movement was in many ways a direct response to and a rejection of the previous decade's stance on how pre-historic development occurred. The processualists would argue against Kossinna's and Childe's cultural-historical view that culture was a collection of norms which one specific group held, and which only ever changed through diffusion, contact with another of these groups and the culling of the herd of those cultures, who were unable to withstand a stronger group (cf. Kossinna 1911, 1919; Childe 1925, 1929, 1950, 1958), instead those who became followers of the New Archaeology movement would argue that these changes occurred due a pre-historic groups' ability to adapt and make use of the environment which they were active in, and not because of another group forcing them away (Trigger 1989, p. 295–297).

Through the usage of new theoretical frameworks based in both anthropology and sociology, archaeologists sought to achieve some resemblance of absolute understanding of the world's pre-historic past. White and Steward were amongst the more prominent American anthropologists which influenced the New Archaeology, and they would help to lay the foundations for the development of this thought movement. Especially White who through his connection to Binford came to affect the development of the archaeological discipline (cf. Binford 1965; Osborn 2011). This connection between the two can be viewed through the fact that in America archaeology is a sub-discipline to anthropology, whilst in Europe it is more linked to historical studies (Trigger 1989, p. 300–301).

Nevertheless, during the 1960s this way of thinking was considered a radical change from the previous few decades of archaeological studies, and it was an attempt to solidify the archaeological discipline in a more scientific foundation. Archaeologists such as Caldwell, Binford, Clarke, and Flannery would go as far as to argue that the culture-historical approach was simplistic, and that it lacked both methodology and a scientific base, that in the end resulted in completely wrong conclusions (cf. Caldwell 1959; Binford 1962, 1965, 1968; Clarke 1968; Flannery 1968, 1972). Binford was possibly one of the most vocal advocates for the processual thought movement, and he was additionally the one who promoted that through the study of living 'native' populations, it would be possible to fully comprehend how historic populations lived and functioned (Binford 1962, p. 217–219).

There was a belief that through more scientific-theoretical frameworks it would be feasible to entirely grasp how most pre-historic societies had developed, by studying and understanding how one population adapted, it would be logical to assume that other groups applied a similar system to develop. There was the notion that if one group of hunter-gatherers who lived and adapted to one type of environment, it was, according to the processualists, feasible to assume that another group which lived in a comparable environment would develop along the same stages, and that a group depending on environment, would have to go through the same stages of development (cf. Meggers 1960, p. 305–308; Binford 1972). There was a desire to generalize and see large scale connections, and a linear advancement all throughout history. Binford argued that archaeologists would be able to conduct any kind of research which ethnologists could, and do this over a much larger timespan, and this is moreover one of the primary points which would win him a lot of support amongst primarily younger archaeologists who were tired off the old system (Trigger 1989, p. 298). The ideas of Binford would later inspire British archaeologists such as Renfrew (Renfrew 1972, 1982, 1984). The New Archaeology was not as popular in Europe as it was in the United States, but it was still practiced during the greater part of the 1960s and 1970s. However, it should be acknowledged that the processual archaeological movement was not one unified creed, but rather there were many different sets of views and scientific values, yet most of these archaeologists shared some core principles.

- They took a point of departure in logical-positivistic theory of understanding (cf. Binford 1972; Flannery 1968, 1972; Renfrew 1972, 1982, 1984).
- They were influenced by the natural sciences where things could be proven and disproven based on facts, and where things could easily be categorized and measured. This shift towards the natural sciences can simultaneously be exemplified by the logical positivism which existed in subjects (cf. Binford 1972; Renfrew 1972, 1982, 1984).
- They shared a neo-evolutionistic view of the past and cultural change, where past societies would evolve in a linear fashion. (Binford 1962, 1965, 1968; Clarke 1968; Flannery 1968, 1972).
- They were inspired by other disciplines primarily, anthropology, and sociology. Therefore, processual archaeologists would attempt to apply methodological-theoretical frameworks such as structural functionalism, and system theories onto pre-historic societies (cf. White 1949, 1959; Steward 1955; Binford 1962).

Summary of the processual archaeology

Thus, it is possible to view the processual movement as an attempt to not only distance itself from past theoretical frameworks, but to modernize and transform the archaeological discipline into a more respectable science. Yet, it

is important to view the processual archaeological effort as a response to the previous cultural-historical approach, and that it is a reaction to what had previously been. Archaeologists such as Binford, Clarke, Flannery, rejected these ideas and looked elsewhere for answers, and they would later find them within anthropology, sociology, and the natural sciences (cf. Caldwell 1959; Binford 1962, 1965, 1968; Clarke 1968; Flannery 1968, 1972).

These archaeologists believed that to make archaeology a more serious discipline, there was a need to be able to measure all data, and to find general trends amongst different cultural groups. This effort was likewise intended to free the archaeological discipline from its political past, and instead it would make the field more scientific neutral, especially since everything could be measured with different categories and frameworks (Trigger 1989, p. 295).

However, it is not the aim of this paper to discuss the entire development of the "New Archaeology" effort, but rather to focus on the critique which it received by post-processual archaeologists, yet there is still a need to contextualize the greater aspects of the processual archaeology movement. It is slightly ironic that the critique which was presented by the processualists towards the culture-historical archaeologists would later come to be used to describe their own framework particularly since this was the issue which they had pushed to solve by implementing new models.

Definition of what Post-Processual Archaeology was and the historical context to the rise of it

Processual archaeology would be a continuous part of the archaeological discipline all throughout the 1960s, 1970s into the 1980s before the criticism began to emerge to the degree where it would be considered "post-processual". The most vocal post-processualism's "critique", as it was dubbed in 1980s, opposed the positivist quest for general rules and stages that controlled both actions and the archaeologists' perception of the past. Instead, according to post-processualists, archaeologists should pay more attention to symbolics, structures, and context (Trigger 1989).

The symbolic and systemic post-processualist archaeology was established primarily in England with the scholar Hodder (cf. Hodder 1982, 1986, 2004), and he would inspire academics such as Earle (Earle *et al.* 1987), Shanks and Tilley (cf. Shanks & Tilley 1987a 1987b, 1989). Hodder argued in books such as *Symbols in Action* (1982) that the word "culture" had become almost embarrassing to positivists who were ignoring the fact that, while material things are important, and the remains may reflect environmental adaptation, they may likewise reflect social diversity. Hodder would to a certain degree become a figurehead for the post-processual thought movement, in the same way as Binford had been for the processual archaeology, and Hodder would instead advocate a more contextual approach, which once again focused on the material remains, and which saw them for what they meant in their specific context (cf. Hodder 1982, 1986). The positivists' practical, adaptive prism blinded them to the gaping blank spots in their studies, and the pre-historic individual had almost been lost for the sake of large-scale generalizations and interpretations, all of which did not put any tangible value on the unique, singular cases.

According to the post-processualists, culture should not be reduced to a collection of external factors such as environmental change, but rather functions as a multi-faceted organic reaction to daily realities, from their point of view the past was not written in stone, and it was folly to attempt to present it as such. Post-processualists argued that cultures are made up of a slew of political, economic, and social factors that are, or at least seemed to be, exclusive to a particular community in a particular time and place and were nowhere near as prevalent elsewhere and as inevitable as the processualists argued. This perception that there was more to cultural change and development than just environmental factors, is what drove archaeologists such as Kristiansen to focus on class and economic aspects (cf. Kristiansen 1984, 1991), and others such as Gillberg and Gilchrist to focus on the conflict between genders (cf. Gilchrist 1991; Gillberg 1995). These avenues for cultural change had been

somewhat left aside during the height of the New Archaeology movement, but during the 1980s and 1990s they would emerge as important points of discussion.

Another common theme within the post-processual archaeology was the condemnation of the notion that archaeology could be entirely objective, and that the discipline would be able to distance itself from the political dimension. Shanks and Tilley are two vocal post-processualists who argued against the processual archaeological school of thought (cf. Shanks & Tilley 1987a). There was a fundamental disagreement over if archaeology could lead to any confirmable facts, or if archaeologists should strive to portray them as such. However, it should be stated that the post-processual archaeological thought movement, like the processual one, was not cohesive, but rather post-processual archaeologists did share some core anti-processual critique principals.

- Post-processual archaeologists argued against the environmental aspect of the processual archaeology, and there was a critique of the generalisation which was being performed within the processual school of thought (cf. Hodder 1982, 1986; Shanks & Tilley 1987a 1987b, 1989).
- They critiqued the fact that the individual had been given a secondary role within the different processual frameworks, and they believed that there had to be more room for exclusive cases and interpretations based on the individual (cf. Kristiansen 1984, 1991).
- They critiqued the exclusion of the idea that cultural change could occur as the result of external factors, such as migration and other more radical changes.
- They criticized the deliberate exclusion of factors such as identity, ethnicity, gender, class, and other social aspects (cf. Gilchrist 1991; Gillberg 1995).
- There was a large-scale critique of the processual belief that the archaeological discipline could achieve the same amount of scientific objectivity as the natural sciences (cf. Hodder 1982, 1986; Shanks & Tilley 1987a 1987b).

Summary of the post-processual archaeology

The application of the processual archaeology was according to post-processualists a simplified, generalized, and dumbed down version of what the pre-historic past was, and it presented a reality where there were no longer any room left for diversity or irregularities, because everything could be explained through the usage of the world systems, and by comparing similar cultures. Therefore, the material culture and the individual had, to a certain degree, been lost, and they had been replaced with a more easily understood and generic view of the pre-historic past. Post-processual archaeologists such as Hodder, Shanks and Tilly would instead focus upon the material remains, and the unique context which they were found in. Thus, the post-processual archaeological thought movement should be understood as a direct response by archaeologists to what they believed were the blank spots within the processual point of view. There was likewise the belief that if the archaeological discipline become too reliant on generalizing models, then the essence of archaeology might be at stake.

'New' scientific methods and recent developments in archaeogenetics

After having contextualized why there occurred a methodological and theoretical shift within the archaeological discipline both during the 1960s as well as throughout the 1980s it is time to discuss the contemporary critique towards these improved scientific methods, but similarly what these texts are discussing. Primarily the focus will rest on the critique provided towards the current usage of aDNA and archaeogenetics, and the results provided by studies concerning them (cf. Allentoft *et al.* 2015; Haak *et al.* 2015). Since 2015, the year when both Allentoft *et al.* (2015) and Haak *et al.* (2015) were published in the journal *Nature*, there has been an increased interest in new and improved scientific methods, and there is no denying that both these papers have thoroughly highlighted the developments which have occurred in the archaeological discipline. It is particularly valid to state that both

these papers have emphasized the scientific advancements within the field of aDNA. What they additionally clearly indicate is that there is now a new well-functioning method to approach the pre-historic past. With the usage of aDNA it is now possible to pinpoint the origin of buried individuals. Through these new improved methods, the applicants now claim that it is feasible to both prove and disprove past notions regarding pre-historic mobility. There were of course works published prior to this which made use of genetics to try and answer questions about the past (cf Krings *et al.* 1997; Reich *et al.* 2010; Prüfer *et al.* 2014). However, it could be argued that the works of Allentoft *et al.* (2015) and Haak *et al.* (2015) were those which brought these decades' worth of knowledge into the field of archaeology.

It is with this in mind that this paper has chosen to discuss both Allentoft *et al.* (2015) and Haak *et al.* (2015), because they in many ways represent the culmination of decades' worth of scientific progress towards this revitalized usage of genes and DNA to answer archaeological questions. Naturally, aDNA had been applied before (cf. Cavalli-Sforza 1994), but it is difficult to argue against that as of late the notion of aDNA has gotten more attention than it did before during earlier periods. It should be mentioned that these two articles came under some heavy criticism after they were first published (cf. Heyd 2017; Furholt 2018), and the critique they received are of value when comparing these contemporary studies with the processual archaeological thought movements. Thus, this paper would be doing a disservice if it did not study these two papers which in many ways have set the tone for many studies regarding migration.

This tone will be exemplified here by looking at one paper, Scorrano *et al.* (2021), which was published a few years after 2015, and which reference the previously mentioned papers. Naturally, it should be made clear that the article presented here does not represent all works and projects which are making use of aDNA, but rather this paper can indicate some of the weaknesses with these methods, and why there is a need to further examine how they are being applied.

In the case of Haak *et al.* (2015), the paper suggested that massive migrations were the primary reason for the spread of Indo-European languages into Europe, whilst the authors at the same time provide proof in the ancestry traces that there exist glaring genetic differences between early and late Neolithic individuals. The project itself consisted of taking samples from 69 different 'Europeans' from various locations, all of which lived between 8000 and 3000 BC. After collecting these samples they would enriching these DNA libraries for a target set of 400 000 ancient DNA libraries, they made use of 119 ancient samples (Haak *et al.* 2015, p. 1).

To confirm the spread of the Indo-European language, Haak *et al.* (2015) sought to track the ancestry of the Yamnaya culture in Central, Eastern, and Western European individuals who belonged to the Corded Ware Culture (CWC), during the Neolithic 8000–3000 BC. Therefore, by detecting a change in the ancestry of the chosen individuals, from the late and early Neolithic, the article argues that it is possible to see the signs of large-scale migrations by the Yamnaya 'people' from the Eastern-Steppes (Haak *et al.* 2015, p. 4). The data which Haak *et al.* (2015) present is compelling and supports the theory that during the Neolithic there occurred both mobility and mixing, and that various groups encountered one another, such as the referred to CWC and the Yamanya people. The paper furthermore discloses evidence that something happened which caused an increase of this Eastern ancestry towards the end of the 3rd millennium BC. The late Neolithic individuals had up to 75% steppe ancestry which was a drastic rise compared to the early Neoltihic farmers (Haak *et al.* 2015, p. 5). However, if this inflow of steppe-ancestry was the result of large-scale migrations or something else is yet debatable. According to Haak *et al.* (2015) this influx of ancestry by extension indicates an origin for the Indo-European languages into Europe (Haak *et al.* 2015, p. 1). Haak *et al.* (2015) supports the reasoning that by observing the spread of the ancestry there is a possibility to see the pattern and observe the spread of language as well as culture. There is even a connection made to the 'steppe-hypothesis' which suggests that the first Indo-European to speak a 'European' language would have been pastoralists from the steppes north of the Black and Caspian seas. The idea is that their language would have spread into Europe after the discovery of the wheel and the ability to transport goods (Haak *et al.* 2015, p. 5). This theory is what in the past has been suggested by Childe (Childe 1925, p. 26–27).

In the case of Allentoft *et al.* (2015), the authors suggest that large scale migrations were the main driving force for the spread of the Indo-European language. However, they would be making use of a different approach compared to Haak *et al.* (2015), instead they focused upon low-coverage genomes, which were collected from 101 individuals over a period of around 2000 years (3000–1000 BC) (Allentoft *et al.* 2015, p. 167). The sample size which Allentoft *et al.* had at their disposal (101) was somewhat larger, whereas Haak *et al.* (2015) had studied 69 individuals; Allentoft *et al.* were working with a few more, and they were working with a narrower timeframe.

Nevertheless, with the collected data Allentoft *et al.* (2015) argue the same theory as Haak *et al.* (2015), specifically that the Eurasian Bronze Age was an era of major cultural changes, and this resulted in both the movement of individuals and languages (Allentoft *et al.* 2015, p. 168). There is a similar rhetoric in both papers, and both imply that the spread of the Indo-European language is linked to the migrations of the Yamnaya people (Allentoft *et al.* 2015, p. 170; Haak *et al.* 2015, p. 5). Both papers moreover discuss the Yamnaya people as if they were a unified ethnic entity, rather than viewing them as more fluid groups of people. Nevertheless, the stark difference between the two is that data of Allentoft *et al.* (2015) in addition indicate that the sampled individuals had a light skin pigmentation, and that these characteristics were present in a high frequency during the Bronze Age (Allentoft *et al.* 2015, p. 167). Allentoft *et al.* (2015) likewise reveal that lactose tolerance was not yet present within the European context, but rather that this is something which came later (Allentoft *et al.* 2015, p. 171).

This brings us to the later studies which have been written and published after 2015 and which discuss a similar topic as the aforementioned papers. Scorrano *et al.* (2021) likewise advocate that there occurred a major influx of Steppe Ancestry during the Third Millennium. The aim of this paper was to evaluate the influence of the Steppe migration on European Bronze Age Populations, such as the Corded Ware and Bell Beaker cultures. This aim would be achieved by observing and examining both male and female genetic contributions, and through this study the authors would be able to answer the question whether it was a male or female based migration (Scorrano *et al.* 2021, p. 223–224).

The paper and study applied a Principal Component Analysis (PCA). The study later verified the impact of the male/female genetical impact on the Bronze Age European population by analyzing the mitochondrial DNA, Y-chromosomes, and X-chromosomes. The individuals which were chosen within the boundaries of this paper came from several different prehistoric periods (Scorrano *et al.* 2021, p. 224). The study performed PCA analysis on an estimated 864 published and recorded ancient individuals. The result would yield an image that it was predominantly male driven migration which resulted in the establishment of a steppe ancestry within the European Bronze Age populations (Scorrano *et al.* 2021, p. 230). This theory of a large-scale steppe migration works in tandem with the previous works of both Allentoft *et al.* (2015) and Haak et al. (2015). However, Scorrano *et al.* (2021) incorporate the difference in the mitochondrial gene pool, where the data instead highlight the difference in gender and allow for a more nuanced view of the past.

Critique of the usage and representation of archaeogenetics and the fear of misuse

As these methods have been developing, there has been an increased sensation of dread from several archaeologists, (cf. Müller 2013; Heyd 2017; Furholt 2018, 2019a; Hakenbeck 2019; Frieman & Hoffman 2019) who all are observing a dangerous trend to the current usage and presentation of these improved scientific methods. There is a concern that too simplistic migration models and concepts of population, which all heavily lean on the idea of migration as an answering tool, without making full use of the archaeological contextualization, may support a return to Kossinna's discarded culture-historical archaeology, which could lead to a reappearance of the 20th centuries far-right political misuses. This notion that far-right political groups 'may' make use of this research is not something that is taken out of thin air, since both Haak *et al.* (2015) and Allentoft *et al.* (2015) have been mentioned on the far-right website, Stormfront (Hakenbeck 2019, p. 521).

Naturally, there are several reasons why this sort of research could be of interest to such political elements, but the main appeal, according to the research of Hakenbeck, is that the concept of a male dominated, war-like people, which banded together for adventures, resonates with the individuals connected to such political ideologies (Hakenbeck 2019, p. 521–522). So, the fear that the current presentation of the data could lead to political misuses, is not only warranted, but should be taken incredibly seriously, because without proper nuance or contextualization, archaeogenetics might be used as a tool for political forces, but it will be used as a tool for those groups which are heavily connected with the idea of race and racial purity.

This misuse is not necessarily only a far-right issue, but rather many political groups may hold an interest towards the past. Yet, within the boundaries of this paper it was particularly interesting to mention how the far-right make use of scientific papers since it explicitly mentions Haak *et al.* (2015) and Allentoft *et al.* (2015). However, it should be said loudly that this usage of the archaeological discipline by political forces should not discourage archaeologists from conducting important work. There will always be those interested in using the sciences for their own personal gains and archaeology is no exception to this misuse. Archaeology was twisted by the British during the era of colonialism and imperialism (cf. Andersson 2020, p. 31–33). Or when Kossinna's theories were perverted to justify conquests during the Third Reich (Trigger 1989, p. 164–165). The same situation applies here in the age of archaeogenetics. There will be those willing to distort the science for vile purposes, but it should not censor archaeologists. Thus, to negate these potential misuses as much as possible archaeologists should disclaim and further contextualize the scientific issues which they are working on.

Still, there is more to it than the fact that the presented data could be used to political purposes, but there are clear deficiencies in both the models, as well as the conducted research, something that Furholt addresses (cf. Furholt 2018, 2019a, 2019b). Furholt mention the fact that the models are far too simplified and due to the magnitudes of the studied time-periods, it is difficult to speak with any kind of certainties, something that is a reasonable critique. Yet, in both Haak *et al.* (2015) and Allentoft *et al.* (2015) the data is portrayed as an absolute truth, and the selected individuals are depicted as clear representations of the whole Yamnaya people, even though the combined samples have been collected from 170 individuals. And this raises the question, if these samples can truly be considered representative of an entire cultural phenomenon, and if it really can be justifiable to make such grand claims as both these papers seemingly do. Furholt likewise takes issue with the fact that there are talks of population, and large-scale migrations, because in a similar fashion as with the individuals, it is difficult to know for certain that there even were large-scale migrations, because, what is there to say, these were not just some unique instances (Furholt 2018, p. 169–170).

There is an argument to be made that Furholt is right in his assessment because it could be that the remains of these individuals have survived the test of time due to the burial rites, and not because of an 'invasion' from the East. Therefore, there is a possibility that the only reason why archaeologists are not able to find other traces, is because other groups had different burial customs and left fewer remains. Yet, neither Haak *et al.* (2015) nor Allentoft *et al.* (2015) make mention of any other possibilities except for the idea of large-scale migrations. Furholt goes further and claims that there are clear problems with how archaeologists make use of archaeogenetics, and that there exists a need to not only nuance how the discipline approaches these methods, and the perception of migration, but rather the entire concept of pre-historic mobility (Furholt 2018). As Furholt maintains in his article, there are more than one explanation for pre-historic human mobility, and to only consider migration as the primary motivation for such is to simplify the entire concept (Furholt 2018, p. 169–170). He takes this discussion further in another paper from 2019 where he presents the issue that the whole concept of migration is possibly the culmination of several smaller movements, which came as the result of regional and local circumstances (Furholt 2019a, p. 124).

The critique of archaeogenetics is therefore not necessarily a critique of the usage, but rather how the information is being shared and the implications which the data might have if it is not contextualized properly. Kallen *et al.* (2019) make some valid points of discussion on the relationship between aDNA and the popular media,

and in their paper they raise the subject of how archaeogenetics is being portrayed in the public sphere and the implications which this portrayal cause for our contemporary society. In their article they discuss how the public impact of aDNA is simply another extension of the shifting relationship between science and the media. Kallen *et al.* (2019, p. 72) mention the fact that by somebody aDNA has been described as a 'celebrity science', and that this position is only amplified by the fact that over the last few decades archaeology as a field has been romanticized by characters such as Indiana Jones (Kallen *et al.* 2019, p. 72–73). This is a topic which was discussed by Hakenbeck (2019), but her study addressed the popular political usage such as the allure which aDNA has to certain factions. The usage of the archaeological record for political purposes is nothing new and it is very likely to continue for as long as the discipline exist (cf. Atkinson & Sullivan 1996; Bueno 2016).

There are additionally those which argue that as aDNA takes on a more prominent role within the archaeological community, there is a risk that the archaeology will become subservient to the natural sciences. In their paper from 2020, Crellin and Harris discuss which role the archaeology and the material remains will have as the archaeological field involve itself and become more reliant on aDNA (Crellin & Harris 2020, p. 50–51). Like previous authors they do not condemn the usage of aDNA or the data, which is being provided, but rather they like previous authors strive to further the debate in how these methods shall be used to ensure that they are not misused or not misrepresent the past (Crellin & Harris 2020, p. 48).

Summary of the critique towards archaeogenetics, and the 'new' scientific methods

Naturally, it is easy to be critical about these pioneering studies, and even if aDNA has existed for decades now, it has only recently really received a lot of attention, and archaeologists are still finding their way in how to best make use of these methods. However, the author of this paper argues that because it is developing field, it is more important than ever to get it right, and to present the data in generalizing and large sweeping terms is not only wrong, but as Hackenbeck demonstrates, it could be out-right dangerous (cf. Hakenbeck 2019). The mutual concerns of those who are critical (cf. Müller 2013; Heyd 2017; Furholt 2018, 2019a, 2019b; Hakenbeck 2019; Frieman & Hoffman 2019; Sykes 2019) are that they deem that the presented conclusions are currently too generalizing, there is an acute lack of contextualization.

These issues are highlighted in both mentioned case studies, Allentoft *et al.* (2015) and Haak *et al.* (2015), because with small sample sizes quite large-scale conclusions are drawn, for example, the notion that these sample sizes could represent entire groups of people (cf. Allentoft *et al.* 2015, p. 168; Haak *et al.* 2015, p. 1). There exists a concern that due to oversimplifications of the concept of mobility, as well as a lack of contextualization when it comes to archaeogenetics, the current applications may lead to not only missuses, but in addition to misinterpretations of the past. Thus, there is an argument to be made that the most recent usages of aDNA are receiving a critique similar to the former processual archaeology. Simultaneously, the current critique directed towards these improved scientific methods shares traits and arguments with the past post-processual archaeology.

Yet, it should be stated that these are still approaches in their infancy, and there is tremendous potential with their usages, something that has been laid bare when we observe how these methods gave answers to questions which traditional archaeological methods could not answer with certainty (cf. Reich 2018, p. 25–26). However, this raises a few valid questions, namely: Is the archaeological discipline on its way of tunnel visioning itself in a similar manner as it did with the processual archaeology? And will the data which is now being brought forward be debunked in a few decades as even more specialized methods are being developed and put to use? The reason why these questions are worth raising is because they might help determine with which certainty that archaeologists claim to see the past in the gathered data. If archaeologists know that they might be debunked in a few years, should claims of certainty be mentioned at all?

Attempt to nuance these 'new' methods in a less generalizing manner

Naturally, as previously mentioned there are countless more papers which have been written using aDNA, the archaeological discipline is currently undergoing a shift in how it approaches the past, and for better or for worse will these improved scientific methods remain a part of the archaeological field, at least for the foreseeable future. This leaves us with another question, and that is how archaeologists best implement them and avoid becoming too reliant on them. There are archaeologists which to their credit are striving to make good use of the same data, and trying to further contextualize the same material.

There are currently attempts to nuance both the usage of aDNA, but also the concept of mobility, one good example of this is Ahola and her research of the CWC of the Eastern and Nordic Baltic Sea region and how they interacted with the previous Hunter-Fisher-Gatherer communities. It is established that the CWC re-used preceding burial sites, and that they did not seek to disrupt those which already laid to rest in the graves (Ahola 2020, p. 7). By making use of the latest aDNA developments, Ahola can argue for a potential pre-historic religion which had related burial rites. This research emphasizes the importance of religion during the 3rd millennium BC (Ahola 2020, p. 1–2).

The article (Kristiansen *et al*. 2017) is another example of an effort to nuance the concept of migration and mobility, and to push the usage of these improved scientific methods further. Kristiansen *et al*. (2017) propose the hypothesis that instead of unexpected large-scale migrations it was initially mostly war-like and adventuring males who arrived from the steppes. These male individuals would than, according to the proposed model, mix with the native female population and this was later followed by a gradual colonization which occurred during the 3rd millennium BC; this is a step away from the idea of an intense and volatile migration period which is being presented in Haak *et al.* (2015) and Allentoft *et al.* (2015). Even though Kristiansen *et al.* (2017) strive to nuance the concept of mobility, the model is still heavily reliant on the concept of population, such as the Bell Beaker Culture, Yamnaya Culture, and CWC. There is furthermore an emphasis on the notion of war, adventure, and the romanticized idea of men venturing out to discover new lands, something that is similarly the focus of Childe (1925, p. 29). There it could additionally be worth having a discussion on the concept of 'natives' and 'locals' as these are concepts which may be hard to define during the Neolithic when groups were probably more fluid. Nevertheless, it is important to give commendation as Kristiansen *et al.* (2017) still attempt to create more complex explanatory models, and to take a step away from old and debunked theories, and concepts which could be considered simplified.

Another paper which contributes to the field of aDNA and which additionally provide a good contextualization of the inherent difficulties with mobility and migration is Gregoricka (2021). Within the boundaries of this paper Gregoricka strives to act like a bridge between archaeogenetics and the methods which had previously been used when archaeologists tried to answer questions regarding both mobility and migration. The paper describes a multitude of methods which are being used to answer the question of how past individuals migrated and what various parts of the body can tell us (Gregoricka 2021, p. 607). However, there are no direct claims and Gregorgicka takes a humble approach which depicts archaeogenetics as another tool for the archaeologist to make use of. Furthermore, even if the paper highlights some of the incredible strengths that come with the application of archaeogenetics, the author does not claim it to be the only source of knowledge, but rather as a part of the broader archaeological discipline (Gregoricka 2021, p. 612). The paper is an attempt to demonstrate the relevance of bioarchaeology and archaeogenetics, and how these techniques can play a vital role in the future understanding of both mobility and migration. However, the nuance of this paper is the fact that it takes many of the concerns which had previously been highlighted by individuals such as, for example, Furholt (2018), and strives to decrease some of the concerns which archaeologists might have on the issue (Gregoricka 2021, p. 612–613).

Comparing the two different critiques and can a historical approach help nuance the usage of aDNA?

Irregardless of what anyone says, there are some similarities between the 1960s' processual archaeology and the attempt to push the archaeological field towards the natural sciences. The contemporary usages of archaeogenetics is deeply dependent on collaborations with the scientists within the natural sciences, something that the processual archaeology sought to implement, perhaps not as much with their methods used, but more so with their models. As demonstrated in this paper, during the 60s and 70s there was a push to be able to weight and compare pre-historic societies in a factual and natural scientific manner. However, comparing it to what we are observing in our contemporary society, the processual archaeology attempted to make use of scientific models, and the data collected from these, rather than methods used by those applying aDNA (cf. Binford 1962, 1965). Yet, the end result is similar to our contemporary situation in that regard that processualists strived to achieve some resemblance of absolute truth, that the models could be applicable in every culture, and that events could be comparable (cf. Renfrew 1972). This rhetoric is quite in tune with the words of individuals like Reich (2018) who claim that past archaeological methods are becoming obsolete in comparison with those which aDNA and archaeogenetics can provide (cf. Reich 2018, p. 25).

However, as is established previously in this paper, from the post-processual school of thought there was not small amount of critique directed towards the processual archaeological approach. The processualists were accused by post-processualists of streamlining history, and by depending too much on generalizing models which simplified our understanding of the past. Those are arguments similar to those which are currently being used by individuals who critique archaeogenetics, and more modern methods. There is likewise the resemblance in the rhetoric regarding the fate of the archaeological discipline, there were those post-processualists that feared that archaeology would become too dependent on the processual models and that these models were too closely associated with the natural sciences (cf. Hodder 1982, 1986; Shanks & Tilley 1987a).

This is similar when archaeologists today discuss the role which these improved scientific methods shall have upon archaeology (cf. Müller 2013; Heyd 2017; Frieman & Hoffman, 2019; Crellin & Harris 2020).

What can be learned from a historical approach

Thus, it is possible to notice a correlation between past theoretical developments and more contemporary practices, except for the fact that the current critique has not yet argued against the notion of cultural change because of mobility, there are some similarities between the two. However, the most noticeable one is that both argue against the more generalizing and large-scale approach of their respective objective, both the post-processualists and the current criticizers wish to avoid an archaeological discipline, where the individual is downgraded in favor of more generalized and simplified world view. Post-processualists sought to argue against the proceussalists, models, and world-systems. Whilst the contemporary criticizers argue versus the current usages of these improved scientific methods, since they are used to solidify more generalizing concepts of migration, mobility, and population. With these facts in mind there is an argument to be made that a historical point of departure could help provide some knowledge on how to best avoid these generalizing terminologies, and it could possibly help guide archaeologists through this supposedly new scientific paradigm (Kristiansen 2014). Therefore, there is something that could be learned from observing and comparing the paradigm shifts between the processual, post-processual and our contemporary phenomena.

Thus, what can be learned is that those who make use of archaeogenetics should take step back and learn from their forebearers who practiced the processual archaeology and avoid the trap of becoming blinded by the possibilities which now exists, because, by observing the past critique of the processual archaeology, there is an opportunity to learn from their mistakes. The mistakes which they made were, as seen above, that they relied

too heavily on their models and their approach to understanding the past. The models became the source of their knowledge, and in the end, they did hinder the archaeologists more than assisted.

The critique given towards the processual archaeology was primarily that the individual was lost, that gender, ethnicity got lost as a result of sticking to the rules of the models (cf. Hodder 1982, 1986, 2004; Shanks & Tilley 1987a). This is furthermore a critique which has been provided by those raising concerns about the current application of archaeogenetics; there is a concern that reducing past individuals down to just numbers and statistics will put archaeologists at risk of overlooking essential parts of the material culture (cf. Furholt 2018; Sykes 2019; Crellin & Harries 2020).

This leads into another similarity between the two critiques, and that is the fact that the data is simply too small to be representative of entire time-periods and cultures, something that was raised by post-prossecualists, and which are currently being raised by contemporary archaeologists towards the current usage of archaeogenetics. Naturally, there are slight variations between the rhetoric of the two critiques, yet the overall narrative is quite similar. In the case of the critique towards the processual archaeology it was primarily that the models could not be representative for an entire culture, and that you simply could not view each group of individuals as being similar. The theory behind certain models was that you could neatly place all cultures on the same linear path and that each culture would eventually end up on the same scale of complexity (cf. Earle *et al.* 1987; Shanks & Tilley 1987a). The critique towards these models is comparable to the criticism towards the large conclusions which are being drawn by models applying aDNA. The circumstances are different, but there exists a similarity in the regard that both critiques hold issues over the fact that both the processual archaeology and those who currently make use of aDNA draw large-scale conclusions all whilst using the data from quite small sample sizes (cf. Müller 2013; Heyd 2017; Frieman & Hoffman 2019; Crellin & Harris 2020).

Another similarity which is worth discussing and which should perhaps be further developed in a separate article, is the similarity between the fear which existed towards the processual archaeology, and which currently exists towards the contemporary usage of archaeogenetics. Naturally, this fear is not the same and there are clear differences in why this fear existed in the first place, but at its core it is the same fear in the sense that those which held reservations feared for the integrity of the archaeological discipline. The fear was and still is essentially that the archaeological discipline was and is at risk of becoming subservient to the natural sciences, that archaeology is losing itself by becoming to interconnected and reliant on the data provided by methods from the natural sciences. In the case of the critique towards the processual archaeology, it was primarily that the various models and the notion that these models could somehow achieve some absolute understanding of the past (cf. Jensen & Karlsson 2001). This turn towards the natural sciences is to a certain extent what sparked the flames of what would become the post-processual archaeology.

This fear that archaeology might become too reliant on the natural sciences is a recurring theme by contemporary archaeologists such as Crellin & Harris (2020). In their paper they argue many of the points which were raised by previous post-processualists such as Hodder, Shanks & Tilly, and the fears remain the same. Yet, even if there are similarities, they are not the same, and where in the past it was primarily the critique of the models used (cf. Hodder 1982; Shanks & Tilly 1987a), in the present it is more a critique towards the current application of the collected data collected by aDNA (Furholt 2018; Crellin & Harries 2020). The reason for this fear is interconnected with other critiques, that it will marginalize and generalize the archaeological record and turn the discipline into something that it is not. Regardless, this question on what is and what should not be considered archaeological is a separate topic and not something that should be discussed within the boundaries of this paper.

Obviously, it is impossible to draw direct connections between the two critiques, but there are still enough similarities that a historical approach can be of some use in understanding how these thoughts have developed, and hopefully it can help avoid archaeologists from repeating past mistakes from previous eras. Because, as can be observed in both (Allentoft *et al*. 2015) and (Haak *et al.* 2015) the focus became more on the fact that the methods could be used, than how the data was presented, or what it was trying to mediate. Consequently, in the case of mobility, these improved aDNA analyses should perhaps not concentrate on the fact that these migra-

tions or movements occurred, and that we see traces of them, but instead they ought to focus on the question of why they happened, and what circumstances may have forced these pre-historic people to move and migrate. Gimbutas, over the course of her academic career, did strive to answer the question regarding a supposed eastern migration. She did this during a period when many sought to argue against her and there was no way of confirming her theories (cf. Gimbutas 1963, 1965). Gimbutas's theories are in many ways proven right by the usage of archaeogenetics, and those which discuss the notion of eastern migrations should look to take advantage of the rest of her works to entwine its usage and root it with other archaeological evidence (cf. Gimbutas 1963, 1965).

This is something what is perhaps changing the more developed the usage gets, and it is already possible to see some changes by observing more recently published papers, such as Kristiansen *et al.* (2017), Ahola (2020), Scorrano *et al.* (2020), and Gregoricka (2021). These more recent papers all seek to consider some of the criticism which previous papers have received. Nevertheless, it is still important for archaeologists to be aware of the potential impact of a less nuanced conversation regarding their research. By comparing the two critiques it is possible to see what happened when the archaeological discipline became to entangled and reliant on the natural sciences, there occurred a sharp turn against it, and many of the models which had been in used became mostly debunked by the next generation of archaeologists. Thus, those deciding to make use of archaeogenetics should tread carefully and not speak in absolute certainties. Instead, they should seek to contextualize what they seek to answer. The why and how remain equally important to the fact that past events occurred.

Naturally not every paper can work towards this, and the information has to be presented before it can be fully examined, and in order to fully comprehend the data, there needs to be data which can be examined. Yet, even if the data is still being produced by projects there remains a dire need to contextualize and not speak in absolute certainties, because if the data is not disclosed properly there exists a risk that it might be taken in by the popular media and twisted to something what it is not. As viewed in the work of Kallen *et al.* (2019) aDNA is already established within the popular media. They showed within their paper that it did not take a lot for the imagination of the public to take hold and paint a picture of the past and how easily this version was spread. This spread of produced information only seem to grow more frequently as the means to produce aDNA grow more accessible and as it takes an even larger role within the public sphere (cf. Kallen *et al.* 2019). However, the fact that archaeogenetics is given space within popular media does not necessarily have to be dangerous, it might give a false view and lead to misconceptions. There are other instances which are far worse. As seen in Hakenbeck (2019) it does not take a lot for extreme groups to make use of such studies to quite heinous and sinister ends.

This furthermore takes us to one of the primary differences between the critiques and that is the fear of the potential dangers which come with the potential misuse of the gathered information. This is something what was not discussed at all in the critique of the processual archaeology, but which is something what is very much at the forefront of the discussion regarding archaeogenetics and aDNA. The fear of a political misuse is something what has been repeated by several archaeologists (cf. Müller 2013; Heyd 2017; Furholt 2018; Frieman & Hoffman 2019; Crellin & Harris 2020). The fear of applying the archaeological data for political purposes is, as previously stated, nothing new, and there are countless examples of where the archaeological record has been used to serve a political agenda (cf. Trigger 1989; Arnold 1990; Anderson 1991; Atkinson & Sullivan 1996; Gustafsson & Karlsson 2011; Kallis 2014; Andersson 2019, 2020). However, this fear of political misuse is not evident in the critique which the post-processual school of thought had towards the processualone, and the focus of the post-processualists remained primarily on the academia and what they saw as the wrong way of conducting archaeology. However, it should be mentioned that the reason for the critique towards the contemporary usage is entwined with all the previous ones which have previously been discussed, because nobody argues against the application archaeogenetics, but rather how it is being presented. The critique is directed towards the generalizing nature of the data (cf. Furholt 2018; Sykes 2019), that it marginalizes groups and the individual (cf. Crellin & Harris 2020), and that these together lead to the result of that presented in Hakenbeck (2019).

Simultaneously, as there is a need to nuance the archaeological usage of these methods, there is a need to better define the meaning behind socio-political constructs such as *population*, *migration, mobility*, *people*, and to stress that these concepts are artificial, and regardless of the ancestry traces, there is no real connection between those societies and nations existing today, and those that came before.

These are of course immensely difficult topics to address, and there will never be an easy solution to any of these; if the topic is race, migration and mobility, there will be forces which seek to take advantage of the conducted research. However, by continuing to nuance these topics in a manner similar to that of (Kristiansen *et al.* 2017; Ahola 2020; Gregoricka 2021), it is possible that archaeologists can diminish and possibly hamper some of the misuses which will eventually occur.

Conclusion

To conclude, it is possible to see a correlation between the critique which the processual archaeology received, and that which contemporary scientific methods are currently receiving. Primarily, the similarities revolve around the fact that both are by their critics considered generalizing and forego the individual, whilst simultaneously being accused of simplifying the archaeological view of the past. Naturally, it is difficult to draw a direct parallel between the two, because there exist some stark differences, such as the fact that the contemporary critique of aDNA carries a political undertone. This political undertone stem from the fact that the early papers which herald the 'new era' of aDNA appeared to lack contextualization and spoke in absolutes, something that gave way for potential misuse.

It should be observed that as the archaeological discipline become more involved with the natural sciences, it appears to some that it become more generalizing, and there are signs that the individual and marginalized groups suffer because of this. It is far more difficult within the realms of data and statistics to consider the individual and those small things which go against the norm. This happens because, to make the data work, you do have to establish a firmer set of rules which will allow for easier comparison between the collected material. This shift towards the natural sciences and the generalizing which followed occurred during the 1960s and there are indicators that it is taking place again.

To avoid a repeat of the past, it is crucial that archaeologists take a point of departure in their own disciplinary history, and that the discipline learn from past events and thought movements. An example of this would be perhaps to try and integrate those theories which were written before, such as the works of Marija Gimbutas (cf. Gimbutas 1963, 1965). It is possible that a combined version of past theories, together with the newly gathered information from archaeogenetics, is the right pathway to understanding the past. Perhaps wholly studying those which made use of more familiar archaeological methods is the way to fully unlock the future of the archaeological discipline. Naturally, contemporary archaeologists should not forgo their own theory building, but the only way to avoid past mistakes or notions is to fully understand those which came before. This paper proves that it is possible to see patterns from the past, and that there is something to be learned from such. The question remains what else is hidden there, and what new-old knowledge could be of use within archaeology today.

The author of this paper does not claim to have any sort of foresight when it come to the future. Yet, if one was to observe past events and with the aid of them make a prediction about the future, it is very likely that the archaeological discipline in the future will again have to deal with a similar thought movement as the post-processual archaeology, and that there will be some sort of response to a field which is becoming too reliant on methods which negates the material culture. Perhaps this is the circle in which the discipline exists, one generation make one prediction of the past, only to be overturned by the next, and this will spark the next cycle.

References cited

Ahola M. 2020. Creating a sense of belonging: religion and migration in the context of the 3rd millennium BC Corded Ware complex in the eastern and northern Baltic Sea region. *Norwegian Archaeological Review*, 53/2, p. 114–134.

Allentoft M., Sikora M., Sjögren K.-G., Rasmussen S., Rasmussen M., Stenderup J., Damgaard P., Schroeder H., Ahlström T., Lasse V. 2015. Population genomics of Bronze Age Eurasia. *Nature*, 522/7555, p. 167–172.

Anderson B. 1991. *Den Föreställda Gemenskapen: Reflexioner kring nationalismens ursprung och spridning.* Gothenburg: Daidalos AB.

Andersson A. 2019. *Arkeologi som Nationalism: Den Dolda Politiken.* Gothenburg: Gothenburg University.

Andersson A. 2020. *Make Great Zimbabwe Great Again: A study of the political usage of Great Zimbabwe 1980–2020*. Gothenburg: Gothenburg University.

Anthony D. W. 1990. Migration in archaeology: The baby and the bathwater. *American Anthropologist*, 92/4, p. 895–914.

Anthony D. W. 2007. *The Horse, the Wheel, and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World.* Princeton: Princeton University Press.

Anthony D. W., Ringe D. 2015. 'The Indo-European Homeland from Linguistic and Archaeological Perspectives*'. Annual Review of Linguistics*, 1, p. 199–219.

Arnold B. 1990. The Past as Propaganda: Totalitarian Archaeology in Nazi Germany. *Antiquity*, 64/244, p. 464–478.

Atkinson J., Banks I., O'Sullivan J. 1996. *Nationalism and Ethnicity in Nationalism and Archeology.* Glasgow: Cruithne Press. Archeology, p. 1–12.

Bhabha H. K. 1994. Frontlines/Borderposts. A. Bammer (ed.) *Displacements: Cultural Identities in Question*. Bloomington, Indiana University Press. 15, p. 269–272.

Bhabha H. K. 1996. Cultures in Between. S. Hall, P. Du Gay (eds.) *Questions of Cultural Identity*. London: Sage Publications, p. 53–60.

Bhabha H. K. 2004. The Location of Culture. Abingdon: Routledge.

Binford L. 1962. Archaeology as Anthropology. *American Antiquity*, 28/2, p. 217–225.

Binford L. 1965. Archaeological systematics and the study of culture process. *American Antiquity*, 31/2, p. 203–210.

Binford L. 1968. Some Comments on Historical versus Processual Archaeology. *Southwestern Journal of Anthropology*, 24/3, p. 267–275.

Binford L. 1972. *An archaeological perspective.* New York. Seminar Press.

Bueno C. 2016. *Pursuit of Ruins Archaeology, History, and the making of modern Mexico.* Albuquerque: New Mexico University Press.

Burns R. N. (ed.). 2006. *Historiography*. London/New York: Routledge.

Caldwell J. R. 1959. The New American archaeology. *Science,* 129/3345, p. 303–307.

Cavalli-Sforza L., Menozzi P., Piazza A. 1994. *The History and Geography of Human Genes.* Princeton University Press.

Childe G. 1925. *The Dawn of European Civilization*. London: Thames and Hudson.

Childe G. 1929. *The Danube in Prehistory*. Oxford: Clarendon.

Childe G. 1950. *Prehistoric Migrations in Europe*. Oslo: Aschehaug.

Childe G. 1958. *The Prehistory of European Society*. Harmondsworth: Penguin.

Clarke D. 1968. *Analytical Archaeology.* London: Methuen.

Crellin R., Harris O. 2020. Beyond Binaries. Interrogating Ancient DNA. *Archaeological Dialogues*, 27/1, p. 37–56.

Earle T. K. et al. 1987. Processual Archaeology and the Radical Critique. *Current Anthropology*, 28/4, p. 501–538.

Flannery K. 1968. Archaeological systems theory and early Mesoamerica. In B. J. Meggers (ed.) *Anthropological Archaeology in the Americas*. Washington: Archaeological society of Washington, p. 67–87.

Flannery K. 1972. The Cultural Evolution of Civilizations*. Annual Review of Ecology and Systematics,* 3, p. 399–426.

Frieman C., Hofmann D. 2019. Present pasts in the archaeology of genetics, identity, and migration in Europe: a critical essay. *World Archaeology,* 51/4, p. 528–545.

Furholt M. 2018. 'Massive Migrations? The Impact of Recent aDNA Studies on our View of Third Millennium Europe'. *European Journal of Archaeology*, 21/2, p. 1–33.

Furholt M. 2019a. 'Re-integrating Archaeology: A Contribution to aDNA Studies and the Migration Discourse on the 3rd Millennium BC in Europe'. *Proceedings of the Prehistoric Society*, 85, p. 1–15.

Furholt M. 2019b. De-contaminating the aDNA-archaeology dialogue on mobility and migration: Discussing the culture-historical legacy. *Current Swedish Archaeology,* 27, p. 53–68.

Garlake P. 1973. *Great Zimbabwe.* London: Thames & Hudson.

Gilchrist R. 1991. Women's archaeology? Political feminism, gender theory and historical revision. *Antiquity,* 65, p. 495–501.

Gillberg Å. 1995. Mellan kaos och ordning i genderforskning och feministisk teori. *Arkeologen,* 1, p. 5–6, 31–48.

Gimbutas M. 1963. The Indo-Europeans: Archaeological Problems. *American Anthropologist*, *65*/4, p. 815–836.
Gimbutas M. 1965. *Bronze Age cultures in Central and Eastern Europe*. The Hague/London: Mouton.
Gregoricka L. A. 2021. Moving forward: A bioarchaeology of mobility and migration. *Journal of Archaeological Research,* 29/4, p. 581–635. https://doi.org/10.1558/jma.23771
Gustafsson A. 2001. *Arkeologihistoria som historia och som Arkeologi. Studier i Arkeologins egenhistorier*. Gothenburg: Department of Archaeology.
Gustafsson A., Karlsson H. 2011. A spectre is haunting Swedish Archaeology – The spectre of Politics: Archaeology, Cultural Heritage, and the Present Political Situation in Sweden. *Current Swedish Archaeology,* 19/1, p. 11–36.
Haak W., Lazaridis I., Patterson N., Rohland N., Mallick S., Llamas B., Brandt G., Nordenfelt S., Harney E. 2015. Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature,* 522/7555, p. 207–211. https://doi.org/10.1038/nature14317
Hakenbeck S. 2019. Genetics, archaeology, and the far right: an unholy Trinity. *World Archaeology*, 51/4, p. 517–527.
Heyd V. 2017. 'Kossinna's smile'. *Antiquity,* 91/356, p. 348–359.
Hodder I. 1982. *Symbols in action: Ethnoarchaeological studies of material culture.* Cambridge: Cambridge University Press.
Hodder I. 1986. *Reading the Past: Current approaches to interpretation in Archaeology.* Cambridge: Cambridge University Press.
Hodder I. 2004. *Theory and practice in archaeology*. London: Routledge.
Högberg A. 2013. *Mångfaldsfrågor i kulturmiljövården: Tankar, kunskaper och processer 2002–2012*. Lund: Nordic Academic Press.
Jensen O., Karlsson H. 2001. *Aktuell Samhällsteori och Arkeologi: Introduktion till processuellt och postprocessuellt tänkande*. Sverige: Bricoleur Press.
Jensen O. (ed.). 2012. *Histories of Archaeological Practices. Reflections on Methods, Strategies and Social Organization in Past Fieldwork.* Stockholm: The National Historical Museum, Studies 20.
Kallen A., Mulcare C., Nyblom A., Strand D. 2019. Archaeogenetics in popular media: Contemporary implications of ancient DNA. *Current Swedish Archaeology,* 27/27, p. 69–91.
Kallis A. 2014. *The Third Rome, 1922–43: The Making of the Fascist Capital.* New York: Palgrave Macmilian.
Kossinna G. 1911. *Die Herkunft der germanen*. Leipzig: Kabitzsch.
Kossinna G. 1919. Das Siegreiche Vordringen meiner wissenschaftlichen Anschauungen als Ergebnis meiner wissenschaftlichen Methode. *Mannus,* 11/12, p. 396–404.
Krings M., Stone A., Schmitz R. W., Krainitzki H., Stoneking M., Pääbo S. 1997. Neandertal DNA sequences and the origin of modern humans. *Cell*, 90/1, p. 19–30.
Kristiansen K. 1984. Ideology and material culture: an archaeological perspective. M. Spriggs M. (ed.) *Marxist perspective in archaeology.* Cambridge: Cambridge University Press.
Kristiansen K. 1991. Chiefdoms, states and systems of social evolution. T. Earle (ed.) *Chiefdoms: power, economy and ideology.* Cambridge: Cambridge University Press, p. 16–43.
Kristiansen K. 2014. 'Towards a new paradigm? The third science revolution and its possible consequences in archaeology'. *Current Swedish Archaeology*, 22/1, p. 11–34.
Kristiansen K., Allentoft M. E., Frei K. M., Iversen R., Johannsen N., Kroonen G., Pospieszny Ł., Price T. D., Rasmussen S., Sjögren K.-G., Sikora M., Willerslev E. 2017. 'Re-theorising mobility and the formation of culture and language among the CWC in Europe'. *Antiquity,* 91/356, p. 334–347.
Kristiansen K. 2019. Towards a new Prehistory: Re-theorizing Genes, Culture, and Migratory Expansions. M. Daniels (ed.) *Modelling Mobility and Migration in Human History*. Albany, SUNY-Press.
Meggers B. J. 1960. The law of cultural evolution as practical research tool. G. E. Dole and R. L. Careiro (eds.) *Essays in the science of culture.* New York: Crowell, p. 302–316.
Müller J. 2013. Kossinna, Childe and aDNA. Comments on the construction of identities. *Current Swedish Archaeology,* 21/1, p. 35–37.
Mullet D. 2018. A General Critical Discourse Analysis Framework for Educational Research. *Journal of Advanced Academics*, 29/2, p. 116–142.
Murray T. 2008. *Histories of Archaeology: A Reader in the History of Archaeology.* Oxford: Oxford University Press.
Osborn A. J. 2011. In *Memoriam*: Lewis R. Binford, 1931–2011.
Price D., Knipper C., Grupe G. & Smrcka V. 2004. Strontium Isotopes and Prehistoric Human Migrations: The Bell Beaker Period in Central Europe. European *Journal of Archaeology,* 7/1, p. 9–40.
Prüfer K., Racimo F., Patterson N. et al. 2014. The complete genome sequence of a Neanderthal from the Altai Mountains. *Nature,* 505/7481, p. 43–49.

Reich D., Green R. E., Kircher M., Krause J., Patterson N., Durand E. Y. & Pääbo S. 2010. Genetic history of an archaic hominin group from Denisova Cave in Siberia. *Nature*, 468/7327, p. 1053–1060. https://doi.org/10.1038/nature09710

Reich D. 2018. *Who We Are and How We Got Here.* Oxford: Oxford University Press.

Renfrew C. 1972. *The Emergence of Civilization; the Cyclades and the Aegean in the Third Millenium B. C.* London: Methuen.

Renfrew C. 1982. Explanation revisited. C. Renfrew, M. J. Rowlands and B. A. Segraves (eds.) *Theory and Explanation in Archaeology.* New York: Academic Press, p. 5–23.

Renfew C. 1984. *Approaches to Social Archaeology.* Edinburgh: Edinburgh University Press.

Scorrano G., Eylem Yediay F., Pinotti T., Feizabadifarahani M., Kristiansen K. 2021. The genetic and cultural impact of the steppe migration into Europe. *Annals of Human Biology,* 48/3, p. 223–233. https://doi.org/10.1080/03014460.2021.1942984

Shanks M. & Tilley C. 1987a. *Re-constructing Archaeology: Theory and Practice.* Cambridge: Cambridge University Press.

Shanks M. & Tilley C. 1987b. *Social Theory and Archaeology.* Cambridge: Poility Press.

Shanks M. & Tilley C. 1989. Archaeology into the 1990s. *NAR,* 22/1, p. 2–21.

Steward J. H. 1955. *Theory of Cultural Change.* Urbana: University of Illinois press.

Sykes N., Spriggs M. & Evin A. 2019. Beyond curse or a blessing: the opportunities and challenges of aDNA analysis. *World Archaeology,* 51/4, p. 503–516. https://doi.org/10.1080/00438243.2019.1741970

Trigger B. 1989. *A History of Archaeological Thought.* New York: Cambridge University Press.

van Dommelen P. 2014. Moving on: Archaeological perspectives on mobility and migration. *World Archaeology,* 46/4, p. 477–483. https://doi.org/10.1080/00438243.2014.933359

White L. A. 1949. *The Science of Culture.* New York: Farrar & Straus.

White L. A. 1959. *The Evolution of Culture.* New York: McGraw-Hill.