

Who Are We as Historical Beings?

Shaping Identities in Light of the Archaeogenetics 'Revolution'

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Abstract

There is a human fundamental need to know who we are and where we come from. In an age when myths, legends and family memories are starting to fade or become obsolete, science is brought in to fill the gaps and answer these questions. This article introduces a special theme section dedicated to critical reflections on the relationship between the disciplines of archaeology and archaeogenetics. It gives a summary of the 'Can science accommodate multiple ontologies? The genetics revolution and archaeological theory' workshop held in Cambridge in 2018, followed by an introduction to the papers in this theme section. Lastly, I evaluate archaeogenetic narratives in terms of their target audience, knowledge obtained (or not) and future directions.

Keywords: aDNA, archaeology, identity, narratives, reductionism, slow science

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To wake up immersed in pure genetics data, faced with a story which will open unknown paths. Who are we? And how much does the image we construct about ourselves matter?’ (Iusuf 2018)

With these lines, Romanian journalist Selma Iusuf gives voice to the feelings many share in the face of the new DNA technologies and their impact on traditional identity narratives. This type of opinion piece has become frequent in newspapers in recent years, with various authors (scientists, fiction writers, journalists) commenting on the latest DNA news (e.g. Molteni 2018; *The New York Times* 2019; Naughton 2019). This reflects the importance of the topic, which transcends the academic arena into our daily lives, but on a more personal level, it touches on something fundamental about our sense of identity, compelling people to try to find their footing when faced with a deluge of technical and scientific advances.

In her article, Iusuf (2018) talks about her lifelong fascination with family narratives, remembering how she used to press her old relatives to tell stories about domestic objects, wars, relocations and much else from the troubled twentieth century. Her quest to learn about her identity was framed by personal memories for decades, until she recently discovered ancestry DNA tests. Even though Iusuf ends her text before telling the readers if she took such a test, and how it affected the stories she told about herself, we get a possible answer from Daniela Ecaterina Cutaş (2018), a specialist in practical philosophy. Cutaş (2018) wrote around the same time as Iusuf (2018) about her own experience with such tests; she actually tried several in her pursuit of filling the gaps in her genealogic tree and wrote an interesting article last September titled ‘The history within’ for *Scena9*, a cultural online publication. Piecing together family memories, archival work, and genetic data, she hoped to find out more about her relatives lost in the midst of historical events, after her great-grandparents had fled Bucovina (a village then in Northern Romania, now in the Ukraine) during World War II. One important finding was that ‘a person originating from Romania who takes a test offered by the companies on the market (like AncestryDNA, 23andme, or MyHeritage) learns that none of them can confirm a “Romanian” origin’ (Cutas 2018). Instead, the user gets a profile comprising generic mixed elements of their identity, such as ‘Balkan, Greek, East European, Iberian’ etc. Furthermore, by tracing some Jewish Ashkenazi ancestry inherited from her father, the results showed the existence of several third to fifth rank cousins. But upon contacting them, she learnt that the results were misleading: due to the endogamy practiced in the community, very distant relatives appeared genetically much closer than in reality.

1 Unless otherwise stated, the translations from the Romanian original are by the author.

What both of these personal texts bring into view is that the human need to know who we are and where we come from seems more pressing than ever in the twenty-first century. In an age when myths, legends and memories are starting to fade or become obsolete, science is brought in to fill the gaps and answer these questions. In particular, our bodies and bones start being seen as containing our history and identity. As the two articles hint, there are also several problems one needs to face when trying to decode or translate the genetic ancestry results in terms that make sense for a person's self-identity. Most importantly, they need corroboration with other lines of evidence. All these points also frame archaeological discussions on identity and it is the aim of this themed section to discuss important aspects surrounding the narratives on identities and the past prevailing in the field of archaeogenetics.

In the last 30 years, but especially in the last three to five years, this phenomenon of 'root-seekers'² and root-seeking, in which genetics plays an important part, has also permeated the field of archaeology, with the discovery and subsequent technological advances in the extraction and study of ancient DNA. What we now see is geneticists, archaeologists and historians faced with a new field of study, archaeogenetics, and a process of imagining and evaluating new kinds of transdisciplinary endeavours. Ultimately, these specialists are implicitly negotiating an answer to the question: who are we as historical beings?

To discuss this question, my colleague Darryl Wilkinson and I organised a two-day workshop, 'Can science accommodate multiple ontologies? The genetics revolution and archaeological theory' 11–12 June 2018 (McDonald Institute for Archaeological Research 2018). Eleven speakers, archaeologists, philosophers of science and geneticists gathered to discuss this scientific and cultural phenomenon – the 'DNA revolution', a phenomenon with important and widespread implications. By starting from the very practical problems, the challenges raised by combining datasets generated inside different kinds of disciplines, we set out to critically reflect on the epistemological concerns regarding the integration of empirical data, especially genetics, in archaeological/historical interpretative models. Through the number of actors involved, from academics across multiple disciplines, to policy makers, politicians and citizens, and also through its ramifications, this phenomenon has quite a unique impact on how we frame history, identity, and humanity.

This introductory article will first detail the rationale of holding this workshop at this time, and the main topics which emerged during the discussions. In the themed group of papers in this issue, some of the origi-

2 Syntagm inspired from Alondra Nelson 2016.

nal speakers, along with some new contributors, have chosen to further delve into the arguments raised during the two days, so the second part of the article focuses on introducing their articles. Finally, in order to set the stage for the papers that follow, I will bring my own contribution to the debates. To frame the contributors' arguments, I will be asking three key questions: (1) Who is the target audience of these archaeogenetic studies? (2) What have we learnt from them? (3) What are the main aspects that need further elaboration?

Before proceeding further, I think it is important to highlight from the start that a productive discussion does not oppose archaeology to genetics regarding which is the legitimate way to write the past. In a pluralist scientific world, each discipline has its own focus and research agenda aimed at capturing some of the complexities of humans and societies. Instead, this is a reflection on what archaeogenetic results mean for archaeology. The enthusiasm for the new technique of aDNA analysis has too readily trumped other lines of inquiry when it comes to several important archaeological themes, such as the advent of the European Neolithic or of the Bronze Age, migrations, group identities or change. Instead of devising complex narratives that bring together multiple strands of evidence, there seems to be a trend towards reductionist accounts that offer easy answers to identity issues and the past. This trend is also visible in the use of other Big Data models of the past – from climate data to computer-generated demographic modelling. Therefore, through this themed group of papers we hope to encourage reflections on the kinds of research questions that we, as archaeologists, deem relevant to pursue, and the interpretative strategies that tie together the wealth of data that is available (for other critical perspectives see Heyd 2017; Ion 2017a; Furholt 2018, 2019; Veeramah 2018; Horejs 2019; Jones 2019; Hakenbeck 2019; Hawks 2019; Frieman & Hofmann 2019).

A Cambridge workshop and the root-seekers

On a sunny June day in 2018 we gathered for a workshop which was meant to achieve two things: (1) to bring together researchers from different disciplines who have an interest in the topic of human aDNA studies in archaeology; and (2) to create a space for discussion between the speakers and the audience, rather than proposing simple oral presentations. The moment for such cross-disciplinary discussions was ideal, given that aDNA results were becoming ever more present in the media, in scientific applications, and at conferences. At the same time, the first critical reflections were starting to appear (Hofmann 2015; Heyd 2017; Ion 2017a; Sørensen 2017; Furholt 2018). After a couple of previous smaller-scale panels at international con-

ferences such as Central European TAG and the EAA in 2017, the workshop was one of the first events solely dedicated to the topic. This made it an interesting experiment in itself. Following this, other events took place, such as the December 2018 ‘Genes, Isotopes and artefacts? How should we interpret the movements of people throughout Bronze Age Europe?’ Conference at OREA Institute (Vienna, Austria), and in February 2019 the ‘State of the Field 2019: The Ancient DNA Revolution in Archaeology’ event at the Joukowsky Institute for Archaeology and the Ancient World of Brown University (USA) – though each of these events had its own take on the topic, different disciplines invited, and weight given to them.

Why discuss this topic now? To understand this, we need to make a small detour and take a trip back in time. How much though is a matter for debate. Tracing a story to its roots is not an easy endeavour, and this is also true for archaeogenetics. We might start in 1984, with the molecular cloning of DNA of a quagga by a team led by Russell Higuchi, or in 1997 with Svante Pääbo and colleagues’ sequencing of Neanderthal DNA, or even with the 2005 moment when Wolfgang Haak and colleagues published their influential article on Neolithic migrations (see Hagelberg et al. 2015). However, as Diane Setterfield (2018:53) writes ‘The beginning [...] it is only to us that it seems like a beginning [...] Better study where it goes than where it comes from’. With this in mind, even though all these have been crucial landmarks in the advent of the new discipline and its direction, I choose to start my narrative at a later moment in time: in the early 2010s. In what follows, we will see how certain issues and themes brought about by archaeogenetic research slowly built up, leading to the need for a discussion to elucidate some of the misconceptions, problems, and important consequences.

What happened in the 2010s was that several attics, parking lots or other innocuous places revealed bodies of lost medieval kings. In all of these cases, which each created a media frenzy, DNA came to the rescue as the evidence which could conclusively fill what was missing in our historical narratives: proof of identity of the person in question and evidential support for the genealogical and ethnic identity of the ruler (see discussion in Ion 2017b). Or at least this is how the analyses came across in the public sphere. From Henry IV to Richard III in England or Vladislav I of Wallachia, identity was not simply a matter of putting a name to a body, but it quickly got caught up in political, national and even ethical issues – from attempts to redeem Richard III to questions of sampling policies and national history.

One such story broke on the 28th of June 2012, with news of the opening of the grave at the Curtea de Argeş Monastery of one of the first Romanian medieval rulers, Vladislav I Vlaicu (1364–1377) (Mediafax.ro 2012). The goal of the historian and scientists involved in this exhumation, as presented

in media and through their own project documents, was to obtain a number of samples which could then be used to extract DNA (see Ion 2017b). The hope was that the DNA results of the skeleton buried at Curtea de Argeş could fill what was deemed a gap in our sources about the past, and provide evidential support regarding the ethnic origin of the ruler – whether or not he was Cuman (Raport ştiinţific 2014). This investigation was part of a century-long historiographic debate about the ethnic origins of the first Romanian medieval rulers. What caught the attention of the media was the reaction of Puiu Haşotti, the Minister of Culture, who announced his intention to stop this project which according to the press report ‘did not have approval to extract samples’. More importantly, he announced that ‘extracting DNA [from the skeleton at Argeş], which presupposes exhuming the voivode, is insignificant compared with the mark they left on the Romanian people and their history’ (Mediafax.ro 2012).

Many things came out of this dispute over the writing of national history, between traditional historical and archaeological evidence and scientific data, but I would like to draw attention to two points. First, the insistence that DNA will fill a void in our historical memory, one that can only be closed using scientific methods. This narrative strategy is attached to many archaeogenetic accounts, either in the papers themselves (see Ion 2017b), or in their media portrayals. Second, human remains are viewed as providing information through their materiality towards understanding past historical processes. This is not an innovation for archaeology, compared to the discipline of history, as skeletal analysis has a well-established place in writings on the past. But what is new is that DNA evidence enters an arena where the actors involved are using the information to settle historical debates or presumed historical questions. In the Curtea de Argeş example, this was just a recent episode in a century-long Romanian historiographic dispute over the ‘Cuman origin of Medieval rulers’ hypothesis. Both of these points are important for our discussion, and I will return to them later.

Further along in time, following these high-profile cases, DNA soon appeared in the headlines again, this time by moving into the deeper past and getting involved in topics such as the Neolithic revolution (BBC 2013), Indo-European migrations (*The New York Times* 2012) or Medieval tribal identities (especially the Anglo-Saxons and the Vikings, see dailymail.co.uk). In these cases, information made its way into the news several years after the first academic articles had been published on the topics (e.g. Bramanti et al. 2009; Haak et al. 2010; Skoglund et al. 2012; Malmström et al. 2015). What was initially circumscribed to a number of limited themes, quickly grew into a global phenomenon, which paralleled advancements in methodology and technology. Lately, the topic has gained momentum, and these days aDNA is everywhere in the news: from ancestry kits that



Figure 1. A timeline of some of the most important archaeogenetic results that have caught the media's attention.

claim to tell if you have as ancestors 'Roman Britons or ancient Israelites' (Sheffield university 2019), to a reevaluation of ancient civilizations: e.g. 'Ancient DNA analysis reveals Minoan and Mycenaean origins' (*Heritage Daily* 2017; see figure 1).

Paralleling this phenomenon, a (growing) number of archaeologists, anthropologists and historians have been raising several points of concern. These focus mainly on the claims that the new scientific data provide better/new interpretation for understanding historical processes or to provide answers to the question 'who are we?'. What these researchers observed is that there is a problem with the ways in which identity, either ethnic, racial or cultural is envisioned in these scientific narratives (Lidén & Eriksson 2013; Hofmann 2015; Heyd 2017; Ion 2017a; Sørensen 2017; Callaway 2018; Furholt 2018; Veeramah 2018; Horejs 2019; Jones 2019). We are presented with overly simplistic results which tend to ignore scholarship in cultural anthropology, history or archaeology. They generally tend to be descriptive, and to operate on large scales and timeframes, with little interpretation of the social processes involved. The danger is that they can also reify and reproduce narratives focused on population distinctions between ethnic groups or between races.

There have also been a number of articles dealing with concerns regarding terminology (Eisenmann et al. 2018), ethics and protocols of sampling, or their lack thereof (Prendergast & Sawchuk 2018), or all of the above (see *The SAA Archaeological Record* (2019), especially the contributions of John Edward Terrell and John Hawks). Other analysis focused on the 'business-like philosophy' that seems to frame the projects of several large research groups, such as those from Germany, Denmark or the USA (Jones 2019).

Therefore, to elucidate these issues, we convened in Cambridge on 11 June and opened the proceedings with a high-impact case study which had at its core aDNA results, and whose results were shedding a new light on older archaeological debates: the latest Bell-Beaker archaeogenetics papers (Olalde et al. 2018). This paper had recently come out and had made a splash in the press (e.g. *Current Archaeology* 2018; *The Guardian* 2018; *The Sun* 2018), so we took advantage of the fact that we had among us one of its

authors, Christopher Evans. Both he and Christopher Fowler proposed ways in which to explain changes or differences observed in the Bell-Beaker archaeological data at the cross-roads of material culture studies and DNA results. Other archaeologists' interventions focused on the perils of culture historical models (e.g. 'Bell-Beaker migration'), which start from the premise of cultural coherence and wholeness. This was Martin Furholt's point, stressing the importance of taking into account the complexity of social processes. Following the same line, John Barrett questioned the current model of niche construction. In respect to aDNA data, Aylwyn Scally made the point that figures, plots and images in genetics papers do not present 'objective' data points, but are visual representations of interpretations. This was an important observation, given that most archaeologists cannot read genetics papers, and usually rely on such images to 'decode' the information in the text. Instead of taking it as given data we should be able to understand what kind of interpretative decisions have shaped it.

We also discussed issues pertaining to the relationship between the public and archaeology, ethics and cross-disciplinary collaborations: Duncan Sayer highlighted how scientific papers can be influenced by cultural concepts of identity (e.g. the creation of the Anglo-Saxon people). Eva Fernandez-Dominguez talked about the need for ethics protocols of sampling human remains, of publishing them, and not least of designing good collaborations across disciplines. At the moment, there are no specific ethical guidelines for DNA sampling, or for curation (see Austin et al. 2019). Finally, Erika Hagelberg presented a less talked about topic: disagreements regarding methods, or research questions within the field of genetics itself. This is important because most archaeologists cannot evaluate the scientific data, nor the statistical modelling.

The second day showcased what theoretical archaeology, history of archaeology, and philosophy of science can bring to the topic. By taking a case study from Finnish archaeology, Marko Marila proposed a slow science, one that allows us to have time, to think, and develop models for the data at hand. Rune Nystrup then took the example of the recent genetics study of the female Viking 'warrior' to talk about speculation in archaeology and what constitutes strong evidence from an epistemological point of view. Lastly, Artur Ribeiro asked us, 'what is Big Data?' What advantages do Big Data actually provide to archaeology, and who gets the funding?

Some of the thought-provoking questions that participants and the audience raised throughout the discussion were: in what way is aDNA a good method for interpreting change? If we talk about identity, what does it mean to then call something a Beaker complex – what is a population, and how can the genetic and archaeological definitions work together? And directly linked to this, if flows of genes do not equal flows of people, how do we tie

this in in archaeological terms? It also became apparent that interdisciplinarity is not a process of spontaneous generation and that it needs critical reflection. Furthermore, the issues of scale, depth, and meaningful grand narratives are still on the table, and thinking of these (as many generations before us have done) is where the challenge lies for the future. Also, the impact on the public should be a concern for those publishing aDNA research.

Taking arguments further into a themed section

In order to develop the points raised in the workshop, we have decided to come together and continue the discussion. Of the initial speakers, four present their contributions here. John Barrett proposes an archaeological semiotics reading of ancient DNA data, and discusses the problem that he thinks continues to hinder the interpretations that are offered for the transition to farming in Europe. He shifts the focus from genetics data, which simply give an indication of change in genetic material taking place at the dawn of the Neolithic in Europe, to a historical reading of the ways in which these past populations came to be as they are. In so doing, Barrett's article is a methodological piece concerned with how one can think about the dynamics of the past from their material residues: '[t]he means by which we claim to know the past must include both our readings of the signs of the past that we see around us as well as our interpretation of the ways that others might once have experienced and interpreted those same material conditions.' (Barrett this volume:47). At the same time, it is an engaging interdisciplinary study which proposes alternative questions that could incorporate both aDNA data and anthropological perspectives. One such question to frame research on the transition to farming and the Neolithic way of life is 'why hunter-gather populations on the European continent did not achieve their own transformation by adopting the practices of agriculture' (Barrett this volume:44).

Martin Furholt also highlights the limiting way in which aDNA data is used in relation to archaeological information. According to him, and contrary to what we might have expected, the new scientific data has had no 'meaningful impact on the way we view prehistory'. Instead, it has been associated with outdated cultural-historical models which now see a resurgence, such as the migrations of certain archaeological cultures. Thus, Furholt proposes alternative uses of genetics data by looking at third-millennium BC materials. A David Clark-inspired polythetic interpretation of burial data and pottery, Furholt's text advocates 'a practice-based approach to how new transregional objects and practices are integrated into local contexts' (Furholt this volume:53).

Anna Källén, Charlotte Mulcare, Andreas Nyblom, and Daniel Strand, part of the ‘Code, Narrative, History: Making Sense of Ancient DNA in Contemporary Culture’ project, have joined us, with a paper on the important topic of the implications of DNA narratives outside academia. In particular, they take the case study of two recent Viking Age Scandinavia papers – on the Birka warrior woman and the Sigtuna immigrants – and study the ways in which academic narratives interlock with media portrayals and political debates. Taking inspiration from Science and Technology Studies (STS) approaches to the study of the public communication of science, they try to identify the relationships between the actors involved, the political and social implications and the infrastructure where the exchanges take place.

Marko Marila invites us to embrace a ‘slow science’ in order to avoid the perils of scientism and to think more carefully about difference and identity in archaeology. He traces moments in the history of archaeology, in particular the case of the Finnish archaeologist A.M. Tallgren. He then explores the critiques in recent years that frame interdisciplinarity as scientism, and offers as an alternative a view embracing deceleration of archaeology, via Isabelle Stengers’ works on ecology of practices and slow science.

Artur Ribeiro discusses the impact of Big Data and of ‘the reduction to numbers’ in archaeology. In order to move beyond a methodological monism, he explains in what ways case studies are actually the better instances to exploit ‘The Third Science Revolution’. At the centre of his argument is a call for a ‘reconceptualization of the case-study’: ‘the return of the singular’ as he nicely calls it. Such a reconceptualization would incorporate historical and anthropological perspectives in order to recover the human intentionality and place actions in their context.

In choosing the speakers we purposefully tried to bring together as diverse a range of expertise as possible, as this would allow for illuminating cross-disciplinary dialogue. However, usually in the academic arena, given the way journals and departments are set up, these kinds of exchanges do not happen often. This makes misunderstandings more likely, and I will explore some examples of this in the remaining part of the paper.

A revolution, but of what? When scientists debate and disagree

After introducing how the idea of the workshop came about, some of the actors involved and the main themes, let us go a step further and see what lies behind the cross-disciplinary ‘misunderstandings’. This will set some signposts for the discussions that follow this introduction.

As a starting point, in reply to the critiques received, the majority of geneticists who ventured answers to these concerns, either those present in the audience at the Cambridge workshop or those who have taken positions in public debates or through publications, claim that there are no real issues for concern. According to these scientists, the critical reactions can mostly be explained through misunderstandings, misrepresentations, or are due to concepts or ideas lost in translation between disciplines (see Booth 2019).

Illustrative is the latest exchange between John Lewis-Kraus (2019), and David Reich (2019a, 2019b) that took place in the *New York Times* magazine and on the Harvard website respectively: '[b]ut Lewis-Kraus misunderstands several basic issues' wrote Reich (2019a). A similar strategy was adopted by Wolfgang Haak and colleagues in their 2018 reply to Leo Klejn's critique of their 2015 article on Yamnaya migrations. Their initial article stated that:

Western and Eastern Europe came into contact ~4,500 years ago, as the Late Neolithic Corded Ware people from Germany traced ~75% of their ancestry to the Yamnaya, documenting a massive migration into the heartland of Europe from its eastern periphery. [...] These results provide support for a steppe origin of at least some of the Indo-European languages of Europe. (Haak et al. 2015:207)

But in response to Klejn's (2018) critique, Wolfgang Haak and colleagues (Klejn et al. 2018:8) wrote: 'when we refer to the language spoken by the Yamnaya, we are explicitly not referring to Proto-Indo-European', and that

Klejn mischaracterizes our paper as claiming that practitioners of the Corded Ware culture spoke a language ancestral to all European Indo-European languages, including Greek and Celtic. This is incorrect: we never claim that the ancestor of Greek is the language spoken by people of the Corded Ware culture. (Klejn et al. 2018:8)

This is an important place to start a discussion towards finding better collaboration models, given that indeed when two disciplines meet, e.g. archaeology and genetics, they operate with a whole set of implicit assumptions and definitions: what is a population, cluster, migration, and so forth. These terms need clarifying and comparing if we are to devise trans/interdisciplinary projects. Therefore, misunderstandings are bound to happen. However, upon closer examination of some of these geneticists' responses, what initially read like strong archaeogenetics statements (strong from the point of view of evidential claims), became more nuanced or ambiguous after critique. For example, for someone who is not a specialist on this topic, in reading the Kleijn-Haak exchange, it quickly becomes confusing to understand what is the relationship between Yamnaya, Corded Ware, the steppe

and Indo-Europeans. What is the meaning of percentages in archaeological practice (e.g. 70% ancestry), and if the paper focuses on Yamnaya populations, and a ‘steppe origin of at least some of the Indo-European languages of Europe’, then how does this tie in with the fact that ‘the language spoken by the Yamnaya is not Proto-Indo-European’?

It is not uncommon to see the results of aDNA narratives introduced through what I see as the most important misunderstanding, namely that: ‘Ancient DNA has revolutionized archaeology and our understanding of human prehistory’ (Brown University 2017), ‘Ancient-DNA work has breathed new life and excitement into their [archaeologists’] work’ (Callaway 2018), ‘Ancient DNA Is Rewriting Human (and Neanderthal) History’ (Atlantic 2018) or ‘How a DNA revolution has decoded the origins of our humanity’ (*The Guardian* 2017). If, as David Reich, one of the preeminent archaeogeneticists acknowledges, differences among populations are smaller than between sexes (Reich 2018a), then what is all this fuss about? When phrased like this, the results no longer seem worthy of a National Geographic cover. Certainly, sometimes media is portraying scientific results in a quest for the sensational, and it is out of the control of the academics involved (though there are also cases where they bring their contribution). But at a growing rate such narratives become present in academic papers or projects (see several examples in Ion 2017a), and are even embraced by archaeologists. To close with an example from the already cited reply from Wolfgang Haak and colleagues (Klejn et al. 2018:9):

In our study, we did not speculate about the date of Proto-Indo-European and the locations of its speakers, as these questions are unresolved by our data, although we do think the genetic data impose constraints on what occurred. We are enthusiastic about the potential of genetics to contribute to a resolution of this long-standing issue.

But what is actually being resolved here? I think that instead of being on the verge of closing some doors on resolved issues, archaeogenetics papers only open more doors, behind which are a number of problems which need to be discussed. Here it might be important to make a distinction between aDNA results *per se* and the archaeogenetics narratives in which they are incorporated: there is a difference between creating the genetic profile of an individual, and integrating this data into a historical/cultural narrative. The first falls under the competence of geneticists, the second opens up the discussions we are currently having.

Following these lines of DNA evidence as having potential to rewrite the way we are imagining the past, and our identity, a number of scientific papers also stirred up interesting exchanges through online platforms, either in publications or on social media. Three exchanges in particular

highlight both the multi-faceted issues brought by DNA identity claims, but also the fact that the impact of these narratives first and foremost is bound to escape the confines of academia, into the wider public. This in turn introduces the need to take responsibility for the kinds of claims that we put forward. The three debates are the ones prompted by David Reich's (2018a) text from the *New York Times* on 'How Genetics Is Changing Our Understanding of "Race"', the one about the Atacama mummy sampling, and the ones revolving around medieval tribes.

The first case concerned identity, race and genetics. David Reich (2018a) made the statement that: 'we are learning that while race may be a social construct, differences in genetic ancestry that happen to correlate to many of today's racial constructs are real'. In reaction to it, several positions were published in *The Atlantic* and *New York Magazine*, and a letter was signed by 67 academics (Buzzfeednews.com), which was followed by his own reply (Reich 2018b). In the letter, its authors took issue with the biological definition of 'race': '[i]n short, there is a difference between finding genetic differences between individuals and constructing genetic differences across groups by making conscious choices about which types of group matter for your purposes.' (Buzzfeednews 2019). This disagreement on the social units of analysis and on the relationship between social and biological aspects – what a population, or race are – is a key issue brought forward by archaeogenetics, and I will return to it later.

Moving to the second example, the 'Atacama mummy' case mostly revolved around a different issue altogether, namely the ethics and cost of sampling DNA. The discussion started as a reaction to a paper signed by Sanchita Bhattacharya and colleagues (2018) which claimed that the physical appearance of a child-mummy reportedly discovered in 2003 in the Chilean desert was due to 'mutations linked with dysplasia'. The news led to several reactions on Twitter, an opinion piece by Cristina Dorador (2018) in *Etilmercurio*, an online Chilean science news website, a paper published by eight bioarchaeologists (Halcrow et al. 2018), and multiple texts in *Forbes*, *Live Science*, *New York Times* and even in the UK *Daily Mail*. Among the critiques were that 'there was no scientific rationale to undertake genomic analyses of Ata because the skeleton is normal', its context was problematic (it came from a private collection), the destructive sampling of human remains, and that DNA analyses are costly, so they should be employed wisely (Halcrow et al. 2018).

The third debate focused on the relation between DNA narratives on medieval groupings (Anglo-Saxons, Vikings), identity and contemporary right-wing political factions (Hills 2009; Harland 2017; Sayer 2017). Besides these, there have been discussions around the skin and eye colour of the Mesolithic individual known as Cheddar Man (Barras 2018), or the sex



Figure 2. John Hawks on Twitter.

of the Viking warrior woman (Williams 2017; Jesch 2017; Androshchuk 2018; McAllister 2018).

Even so, most of these reactions did not develop into a sustained dialogue, and John Hawks sums up beautifully in his tweet how such exchanges usually develop (figure 2). One can also observe that even amongst those who reflect on the aDNA phenomenon there are limited cross-citations.

Who is the audience of archaeogenetic studies?

In order to understand how we came to have these debates, and also to explain the roots of some of the ‘misunderstandings’, we need to have a clearer idea of who is the intended audience of archaeogenetic studies.

Upon examination, there seems to be a disjunction between the structure of papers and the kinds of discussions the authors want to be involved in. Archaeogenetics papers are published in scientific journals (such as *PlosOne*, *PloS Biology*, *Nature*), by multi-authored teams where the main author(s) is usually a geneticist. Archaeologists appear further down the line, and they are usually a minority. Archaeology provides the contextual data, the names of the analysed populations, and temporal and cultural framings – for example the Neolithic, hunter-gatherers, LBK and so forth. What makes archaeogenetic papers interesting is that traditional archaeological debates (such as the appearance and dispersal of the ‘Neolithic revolution’), are now framed in biological terms rather than cultural. Gheorghe Alexandru Niculescu (2018) presented an interesting paper entitled ‘Inter-

disciplinary practices and the autonomy of the archaeological research traditions' at the UISPP Conference last year, where he highlighted the power dynamics of such multi-authored projects. In essence, based on a textual analysis of several publications, he observed how archaeologists do not usually contribute to the research design, and that their epistemological contribution is limited. Implicitly, their control over the interpretation of data is also limited. Furthermore, the ways in which the papers are designed, from their materials and methods sections, to multivariate analysis and supplementary information, follow a scientific model. Finally, they are based on genetic definitions of what a population is, and not anthropological ones, as reflected by PCA plots based on haplogroup frequencies or Multidimensional Scaling Analysis figures.

Therefore, on the one hand, through the venues of publication and the ways they are written, one could assume that the target audience is first and foremost fellow geneticists, tackling issues of concern for them. Most archaeologists are unequipped to understand or evaluate the accuracy of the majority of the scientific content. However, the incorporation of archaeological terminology and, more importantly, topics, points in a different direction. There are several causes for this discrepancy: the ways specialisations are currently set up in the academic arena, with very few venues for interdisciplinary work, the high-profile journals like *Nature* or *PlosOne* leaning on the hard sciences side, but also the ambiguous relationship between the genetics research questions, and the archaeological terminology employed. This ambiguity is one cause for concern. Either there should be a correspondent paper from archaeologists in archaeology journals, taking the data towards cultural and historical interpretation, or there should be new avenues where mixed data can be published, which can translate information across fields, and interpret it at the cross-roads of disciplines.

What have we learned?

After surveying the first level of archaeogenetic studies, namely their form, let us go deeper, into their arguments. Based on DNA analysis and statistical inferences, scientists have traced movements of genetic material across several geographic areas: early farmers from the Near East to south-eastern Europe and into Central Europe (e.g. Haak et al. 2010; Hervella et al. 2015; Szécsényi-Nagy et al. 2015), Bell-Beaker expansion into the UK (Olalde et al. 2018), movement from continental Europe into Anatolia, and so on. All this data creates interesting premises for opening archaeological inquiries. But in their current stage, how does this data translate into a historical interpretation? Should we read the results as movements of individuals/

groups? Genes do not equal people, so what is the relationship between the movement of genes and that of people? When archaeologists think of migrations and movements, they tend to think of people moving from point A to B, but are there alternative interpretations? What is the relation between movement of people and material culture, knowledge and techniques? Without delving into the mechanisms behind the observed data, these are just preliminary data points offering reductionist accounts of past events (see more in Furholt 2018; Furholt & Ribeiro this issue). Further, simply combining DNA data with isotope results or other data in order to answer the same initial question of ‘were these people foreigners or locals?’ does not change things. While it is an interesting question for geneticists (see also Ion 2017a), *on its own*, it does not add much to archaeology or history. In contrast, Ribeiro (2018b) made a case for incorporating human intentionality into these models dealing with people’s movements and migrations, while Claudio Cavazzuti and colleagues (2019) and Martin Furholt (2019) recently developed complex models which can account for the pattern in the data observed.

This is not to discount DNA results, but to begin to understand how we might integrate them to truly reach a deeper understanding of our past because systems composed of people have different workings than those of genes.³ In her study on the use of DNA results between different ontological models, Alison Wylie (2015) highlights how ‘descendant communities and archaeologists jointly define the research agenda and pursue programs [...] sometimes bringing strikingly different conceptual schemes and methodologies to bear on questions of common concern’. She further talks about epistemic confrontations which lead to ‘limited cross-fertilisation’ – that is, cases in which knowledge is added on, and does not affect the other episteme (Wylie 2015:196). I think until now a ‘cross-fertilisation’ between the latest sophisticated fine-grained archaeological models and cutting-edge DNA projects has not been put to the test.⁴

A possible explanation for this state of affairs might be the observation Sabina Leonelli (2016:122) makes that ‘bio-ontologies are an instance of how theory can emerge from an attempt to classify entities in the world, rather than from an attempt to explain phenomena’. This insight throws a different light on the matter, by suggesting that the two disciplines aim for different epistemic goals: while archaeology has been traditionally interested in the whys and hows of things, genetics narratives have a different

3 Statement inspired by an interview with Jonathan Haidt.

4 To make a general point I am of course painting with quite a broad brush. Inevitably this loses some of the nuances, and I am sure there are enough projects that can prove me wrong. However, I think those are still just exceptions that prove the rule.

scope altogether. Thus, what an archaeologist means by bringing a contribution to our understanding of historical events is different in character from what a geneticist does. The former aims to explain how a cultural or historical event happened, while the latter attempts to classify the genetic events which marked our species. Along the same lines, if we carefully read the aDNA research goals as they are expressed by Joseph K Pickrell and David Reich (2014:385), they seem to aim for ‘studies of population history, and studies of natural selection’. Unpacking this, population refers to clusters of individuals who share some genetic affinities, and history is circumscribed to the question of ‘how did we get to where we are today?’, namely migrations. Not surprisingly then we learn that the study of topics which Reich claims to have shed light on ‘outstanding questions in human history’ or ‘disrupted our assumptions about the past’ (Reich 2018c, xxi) comprise the migration of Native Americans, genetic events in the history of Cambodians, or of Europe in the last 9000 years, all coarse-grained, large-scale narratives of genetic population movements.

However, archaeologists work from the bottom up, and single sites cannot normally capture such changes. If we move upwards, not even clusters of sites which group in ‘archaeological cultures’ overlap neatly on genetic populations: the same population can have multiple cultural expressions, while similar cultural traits (ceramic technology or design, house layout, clothes, land farming strategies and so on) can be shared among several populations. If we imagine a map on which we plot a certain cultural complex – Bell-Beaker for example – and one with genetic populations, then at different points in time the overlap area between these two would change. Therefore, all these points make even more pressing the incorporation of genetic data in wider archaeological interpretative frameworks. A good example which attempts the integration of multiple kinds of data is the recent study signed by Claudio Cavazzuti and colleagues (2019). They observe mobility patterns for a number of Bronze Age Italian communities at the cross-roads of strontium and oxygen isotopes, archaeological, geological and theoretical models.

Another important challenge in reading the archaeogenetic results is the fact that archaeologists are bound to read genetic data against pre-conceived models of kinship categories and cultural communities, as this is how the social sciences have framed the topic in the last hundred years. But what kind of imagined communities do we end up with, and what are the relationships between them? Gisli Pálsson (2007:21) writes about how geneticists represent relations among organisms through the use of specific metaphors, mostly drawing inspiration from a European genealogical paradigm, but at the end of the day these are cultural models like anything else. However, they work parallel to anthropological kinship categories and not

within them. The genetic clusters have their own assumptions built in about temporal changes, about who is related to whom, and maybe most importantly about what constitutes difference.

This later point is illustrated by the way in which employing a specific sampling model – island model versus isolation by distance – can in practice lead to different results (Palsson 2007:181). Taking as an example the study by David Serre and Svante Paabo (2004), analysing the same data through one model led the researchers to observe the existence of ‘two discrete continental units of diversity, Africans and non-Africans’, while the second model found admixture between two populations in varying percentages and ‘no qualitative differences’ (Palsson 2007:181–182). Palsson makes a similar point about the relationship between phenotypic and molecular data, with significant disparities between the two in their results: Melanesian and Africans look more similar than Europeans do compared with Africans, but from a molecular genetic point of view, Melanesians and Africans are the farthest apart (Palsson 2007:179).

These examples thus invite caution when reading about dark-haired or light-skinned invaders, or blue-eyed rulers, about population replacements and stark differences between ‘locals’ and ‘immigrants’. This is not to say that migrations, conflicts or admixtures did not take place in the past, on the contrary we can expect them, and aDNA can contribute to our understanding of them. But until we clarify what is it that the data tells us, in each discipline involved, and the levels of cross-disciplinary compatibility, we should refrain from large-scale narratives.

What are the main issues that need further elaboration?

Moving further along these lines, it appears that the two main issues with archaeogenetic narratives as they are currently phrased are the simplistic explanations that are put forward, and the contradictory conceptual framing of collective identities.

To elaborate, the attraction of archaeogenetic explanations resides in their simplicity. They rely on one strand of evidence to explain a complex phenomenon, which leaves us with reductionist explanations. Similar to Iusuf and Cutaş’s stories, genetic data requires a frame in order to become meaningful if we are to talk about human beings moving in historical time.

Secondly, as the cited public debates touched upon, the concept of collective identities used in these archaeogenetic papers is problematic. Stefanie Eisenmann and colleagues (2018) wrote a good summary of such termi-

nology. She observes how following Wolfgang Haak and colleagues' 2015 study:

[...] nearly all DNA papers on Western Eurasia have used what we would like to call 'mixed systems' for the naming of genetic clusters. All of these systems are based on the same four elements for inventing names that they variably combine and order: 1. geographical terms (like 'Scandinavian'), 2. relative time periods (like 'Early Neolithic'), 3. subsistence practices (like 'hunter-gatherer'), and 4. names of archaeological cultures (like 'Yamnaya'). (Eisenmann et al. 2015:2)

This can lead to ambiguous results. Even though geneticists claim that they use genetic data to create clusters, after which these are compared with archaeological data, the initial samples come from groups 'that have been identified through a completely different line of evidence' (Eisenmann et al. 2015:7).

Reading these papers one receives an idea of clearly bounded units, such as the Yamnaya population, Neolithic early farmers, and Bell-Beaker peoples. This offers the illusion of more coherence than it can be supported on other strands of evidence. According to at least some archaeogenetics papers, these groups seem to have genetic similarity inside the cluster (implicitly linking a culture to its genes). This contrasts with very diverse and complex archaeological discoveries, brought into view through numerous archaeological studies. In the last decades, by employing a wide range of datasets, archaeologists have painted a nuanced and rich landscape of past sites and time periods. It would be a pity to brush over these interesting results by employing ambiguous constructs. The vast anthropological and historical literature either on individual or group identities could be employed with great advantage in such an endeavour.

Some final thoughts

When the Backstreet Boys come out of their retirement and name their tour 'DNA World Tour', you know something big is happening. Therefore, it is no wonder archaeology did not remain indifferent to the advances in DNA analysis. After all, it is wonderful to have the possibility to bring in new techniques and datasets that can aid in our engagement with the past. However, the new data is only as good as the research questions we are asking.

Asked what his identity is, sociologist Zoltan Rostas answered that he is a 'Transylvanian Magyar who now publishes more in Romanian' (Demény 2019). In his case, how much of this multi-layered identity would be captured through a genetic test? Most likely, this would be an irrelevant question for archaeogeneticists altogether, as geneticists have a different

research agenda. Therefore, it is important to go past cultural terminologies encountered in such papers and which might seem familiar to archaeologists, and to ask ourselves in what ways we can integrate this data with other lines of evidence. How can we place them ‘within a narrative which provides them with intelligibility’ (Ribeiro 2018a:23)? It is also likely that Iusuf (2018) and Cutaş (2018) came to a similar conclusion in their endeavours – as history marches on, political boundaries and family ties change, so that even people born in the same village can have different identities through decades or centuries. To bring these complex processes into view is a challenge for archaeology, and something to strive for. Genetic data alone, similar to isotope data, geologic data or carbon dating, will not unravel the complex workings of systems comprising people – which are more than systems of proteins and atoms.

What is needed are more contexts in which different specialists can come together, discuss, and take their time to develop complex interpretative models: from workshops to interdisciplinary journals. The way academia is currently organised does not create the best circumstances for encounters that would allow specialists to become familiar with each other’s methods and questions. So maybe this should be an aspect worth reflecting on, and ‘slow science’ (see Marila in this issue) is precisely what is needed. We should also acknowledge that there is disagreement between competing models of explaining the past, and about what human beings are, and this is perfectly reasonable. Too often when valid questions are asked in relation to scientific results, researchers become defensive or assume the ‘other side’ thinks they are irrelevant. In most cases this is not the case, and such attitudes only hinder productive dialogue.

Ultimately, the central problem is how we constitute past individuals and groups as beings in time through our narratives. Gavin Lucas is right in stressing the ontological value of narratives as a way of configuring humans between inevitability and contingency, and of tying traces together: ‘the challenge is fundamentally about mediating between time as an open, endless succession of almost random events (cosmological time) and time as a closed, finite chain or network of causation and meaningful connection between events (phenomenological time)’ (Lucas 2019:106, see a similar argument in Currie & Sterelny 2018). At the moment, archaeogenetic data functions on the first level. They are data points in search for a context which can give them meaning. So perhaps through engaged dialogue and cross-fertilisation between this kind of data and fine-grained case studies (the second dimension of time) we can move towards historical interpretation. Here archaeology, alongside historical and anthropological models, can contribute to drafting interpretative models that can contextualise the raw data. And this is an epistemological gap worth filling.

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