

Why Archaeologists, Historians and Geneticists Should Work Together – and How*

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In recent years, molecular genetics has opened up an entirely new approach to human history. DNA evidence is now being used not only in studies of early human evolution (molecular anthropology), but is increasingly helping to solve the puzzles of history. This emergent research field has become known as »genetic history«.

The paper gives an overview on this new field of research. The aim is both to discuss in what ways the ascendant discipline of genetic history is relevant, and to pinpoint both the potentials and the pitfalls of the field. At the same time, we would like to raise the profile of the field within the humanities and cultural studies. We hope that the opportunity for communication between representatives of different disciplines will contribute to loosening up the widespread monodisciplinary method of working and, in particular, bring together the relevant scientific and cultural streams of research.

Keywords: genetic history; history; archaeology; genetics; interdisciplinarity.

History in an age of genetics

In recent years, the media have repeatedly seized on the findings of genetic research to make headlines such as the following: »Finding the Iceman's 19 living relatives«;¹ »A million Vikings still live among us: One in 33 men can claim direct descent from the Norse warriors«;² »How Germanic are we?«;³ »Britain is more Germanic than it thinks«;⁴ and »We Europeans are Asians«.⁵ Articles such as these already attest to the increasing attention the field of »genetic history« is receiving in public discourse. They also clearly evoke a major fascination of this new discipline: the promise of a new link between history and modern identities, a connection between past and present established biologically, via the genes people have inherited from historical ancestors. Unlike other scientific methods applied to the study of history and archaeology (e.g. carbon dating or isotope analysis), genetics is immediately con-

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- 1 Langemak, So wurden Ötzis 19 lebende Verwandte aufgespürt.
- 2 Anonymous, A Million Vikings.
- 3 P.M. Magazin, Wieviel Germane steckt in uns?
- 4 Schulz, The Anglo-Saxon Invasion.
- 5 Bild der Wissenschaft, Wir Europäer sind Asiaten.

cerned with issues of identity, since the modern mind perceives DNA as a carrier of identity. Thus problems of the past are often conflated with the question of the ethnic identity of modern populations.

One of the most famous examples of genetic history in recent times are the DNA tests performed on the bones of the last Plantagenet king, Richard III, reburied in Leicester in late March 2015. Excavations, surrounded by much media hype, had begun in 2012. Archaeologists had suspected for some time that the king's remains would be found beneath a Leicester parking lot on the site of the former Greyfriars Church, where Richard is said to have been buried. Many pieces of classical archaeological and bio-anthropological evidence already pointed with overwhelming probability to the fact that the skeletal remains found there were really those of the Machiavellian figure portrayed by William Shakespeare in his play of the same name. In addition, a DNA analysis was performed. It resulted in a close match with living relatives on the female line of descendance of Richard III. But there was no match with those on the male line. Therefore DNA analysis on its own did not give conclusive proof of identity. Yet the mismatch was explained by the plausible hypothesis that there had been »illegitimate« children descending from Richard. And the DNA analysis did not stop at mere efforts of identification. It was also used to reconstruct, with some probability, the hair and eye colour of the individual from Leicester, namely blond hair and blue eyes; thus, the researchers came to the conclusion that the earliest extant portrait of Richard III gives an accurate representation of his physical appearance, while all the later ones do not.⁶ Thus the case of the king beneath the parking lot highlights a second quality that is so appealing in DNA-based history, namely the potential to oppose biological evidence that is perceived as objective and therefore as superior, to traditional documentary or pictorial historical evidence considered subjective and possibly flawed.

Genetic evidence was first used in studies of early human evolution and migration, a field often labelled »molecular anthropology«.⁷ Yet today it is increasingly applied in attempts to try to help solve the puzzles belonging to the field of history »proper«, i.e. those traditionally falling into the academic discipline of that name. Consequently, the emergence of a new, »genetic« history was noted both by participants in the field and by outside observers towards the end of the first decade of the new millennium. Already in 2008 geneticist David B. Goldstein stated: »[...] genetics is slowly earning a place in the historical sciences. Our narratives describing the histories of peoples and events, from the Aryan invaders of India to the Viking attacks on the British Isles, are all being augmented and refined by genetic analyses in a field now often called genetic history.«⁸ In 2010, another geneticist, Chris Tyler-Smith, commented: »[...] genetics is now starting to get at real details of history.«⁹ Anthropologist Yulia Egorova wrote: »The assumption that ›DNA evidence‹ may help in historical research appears to have informed a whole new field in population genetics, which is sometimes described as genetic anthropology or genetic history.«¹⁰ One year later, in 2011, historian of science Veronika Lipp-

6 Buckley *et al.*, ›The King in the Car Park‹; King *et al.*, Identification of the Remains.

7 Sommer, *Evolutionäre Anthropologie*, 135 sqq. gives a comprehensive overview on molecular anthropology and outlines its early phase.

8 Goldstein, *Jacob's Legacy*, 3.

9 Quoted in Callaway, *Spanish Inquisition*.

10 Egorova, *DNA Evidence*, 349.

hardt stated: »[...] now, the last 2000 years are being taken to the laboratory, and history may soon not belong anymore to historians alone.«¹¹ In 2012 anthropologist Nadia Abu-El Haj defined genetic history as a »subset« of »anthropological genetics.«¹² There can be no doubt that history, like anthropology before, today finds itself in an »age of genetics«.¹³ This age is marked by the fact that genetics is understood as »the dominant discourse describing the human condition«.¹⁴ Already a quarter of a century ago a »geneticization«¹⁵ touching upon many fields of knowledge was described, and that claim has only gained in validity since the complete deciphering of the human genome in 2001. Today the prosperity of genetic history is such that we can safely say that it has passed beyond any period of emergence and that historical research that includes DNA evidence is coming now into its own, alongside the study of the traditional sources of archaeology (material evidence) and of history (written sources). The establishment of the field can also be measured by its institutionalisation and public funding. In the last few years, large research laboratories and institutes exclusively devoted to it have been created in several countries, perhaps most prominent among them the Max Planck Institute for the Science of Human History in Jena (Germany).¹⁶

Genetic history studies are finding great attention in the media and the public, as the headlines cited above prove. Academic historians however have been slow to recognise the challenge. With the exception of a very few scholars, namely US medieval historians Patrick Geary (Institute for Advanced Study, Princeton) and Michael McCormick (Harvard University), until recently they have failed to realise both the potential and the provocation genetic history represents.¹⁷ Archaeologists, traditionally more open to scientific methods due to the fact that they have always worked with material sources, have been faster to acknowledge the new field.¹⁸ However, among archaeologists there is an alarming tendency to take the results of genetic history – and indeed of other scientific methods – for granted, a tendency that contributes to an understanding of archaeology as a matter of quantitative science instead of an interpretative cultural studies discipline.¹⁹ It is safe to say that genetic history is not only here to stay, but will grow in importance in the foreseeable future, especially if we consider recent progress in sequencing technology methods and the disposability of DNA material both modern and ancient. It is thus urgent that historians and archaeologists face the chal-

11 Lipphardt, *Der Körper als Substrat*, 109 (translation of original German quote by Jörg Feuchter).

12 Abu El-Haj, *Genealogical Science*, 3.

13 See title of Lindee et al., *Anthropology in an Age of Genetics*.

14 Lippman, *Prenatal*, 18.

15 The concept of »geneticization« was introduced by Abby Lippman in a medical context, see *ibid.*, 19, »Geneticization refers to an ongoing process by which differences between individuals are reduced to their DNA codes, with most disorders, behaviors and physiological variations defined, at least in part, as genetic in origin. It refers as well to the process by which interventions employing genetic technologies are adopted to manage problems of health.« The concept has then been generalised and transferred to non-medical disciplines like the production of knowledge about individual genealogies; see Palmié, *Genomics, Divination, »Racecraft«*, 207. Against employing the term: Abu El-Haj, *Genealogical Science*, 25.

16 For a detailed overview on facilities and on public funding of aDNA research, and the most promising field in genetic history today, see Gibbons, *Ancient DNA Divide*. On the founding of the Jena Institute see also Feuchter, *DNA der Geschichte*.

17 See for example Geary, *Using Genetic Data*; Geary, »Völkerwanderung«; McCormick, *Molecular Middle Ages*.

18 See for example Renfrew and Boyle, *Archaeogenetics*; Renfrew, *Archaeogenetics*; Alt, *Grenzüberschreitungen*.

19 See Samida and Eggert, *Archäologie als Naturwissenschaft?*; Samida, *Archaeology in Times of Scientific Omnipresence*.

lenge of this new discipline of the past. Instead of ignoring the competition from the biology department or accepting it without any deeper understanding, an active engagement with genetic history has to take place in history and archaeology.

The 2015 Berlin conference on genetic history

This is the background against which we – an archaeologist and a medieval historian – organised the first interdisciplinary international meeting on the subject.²⁰ Financed by a grant from the Fritz Thyssen Foundation, »Genetic History: A Challenge to Historical and Archaeological Studies« took place at Berlin's Humboldt University in October 2015 and brought together geneticists, archaeologists and historians, as well as anthropologists and historians of science.²¹ Our first general aim was to discuss among different disciplines in what ways the ascendant discipline of genetic history is relevant, and to pinpoint the potentials and pitfalls of this new field of research, which until now has usually been shaped by geneticists alone. Another aim of the meeting was to raise the profile of the field within the humanities and cultural sciences. As already mentioned, unlike prehistoric and proto-historic archaeology, the historical disciplines, especially medieval history with which we are primarily concerned, have paid very little attention to genetic history to date, even though the discipline is engaged in research on highly controversial topics of medieval history, such as the ethnogenesis of early medieval groups like the Lombards and the Anglo-Saxons. By creating an opportunity for communication between representatives of different disciplines, and creating awareness of genetic history within the historical disciplines, we wanted to contribute to a loosening up of the widespread disciplinary method of working and, in particular, bring together relevant scientific and cultural streams of research.²² More than ever before, a discourse between the natural and the cultural scientists is urgently needed today.²³

The conference also aimed at discussing different methods of research and to confront our invited participants with divergent or new approaches. Our concern here was not to delineate the boundaries between disciplines, but rather to encourage dialogue across these boundaries – dialogue from which all the participating disciplines will ultimately benefit. The conference deviated from the usual structure by scheduling papers to be given in tandem. Two speakers discussed every topic, each from the perspective of his or her discipline or field of research. This approach was meant to help sharpen argumentation from both sides and to elucidate developments within each discipline. This did not, however, mean that we were aiming to polarise the arguments. On the contrary, we were interested in joint discussions and an in-

20 Other conferences held before have concerned themselves with genetics and the past from the viewpoint of anthropology. See Sommer and Krüger, *Biohistorische Anthropologie*.

21 The speakers were: Kurt W. Alt (Danube Private University, Krems), Sebastian Brather (Albert-Ludwigs-Universität Freiburg), Stefan Burmeister (Museum und Park Kalkriese), Manfred K. H. Eggert (Eberhard-Karls-Universität Tübingen), Yulia Egorova (University of Durham), Jörg Feuchter (Humboldt Universität zu Berlin), Kerstin P. Hofmann (Freie Universität Berlin), Mark Jobling (University of Leicester), Johannes Krause (Max Planck Institute for the Science of Human History, Jena), Veronika Lipphardt (University College Freiburg), Brigitte Pakendorf (Centre National de la Recherche Scientifique and Université Lyon Lumière 2), Walter Pohl (Universität Wien), Stefanie Samida (Zentrum für Zeithistorische Forschung, Potsdam), Frank Siegmund (Universität Düsseldorf) and Krishna Veeramah (Stony Brook University). For further information see conference website: www.genetic-history.com (retrieved on 14 September 2016).

22 For intriguing examples of non-collaborating research see Pluciennik, *Clash of Cultures?*; Egorova, *DNA Evidence?*

23 See Egorova, *DNA Evidence?*

terdisciplinary exchange of ideas in which each side respects the other; in other words, what we tried to make possible was a debate that was unprejudiced and open, but also critical. We did not seek to establish interpretational sovereignty, but to engender constructive dialogue. At the end of the conference we were satisfied that these aims were, on the large, achieved.

Among the general questions raised at the conference were the following: How do geneticists work together with historians and archaeologists? What are the advantages and disadvantages of such cooperation? What new knowledge can the results of DNA analysis yield for historical and archaeological research? Does genetic history raise new issues or does it return to old questions of history that were believed obsolete? What is the significance of genetic history in public discourse? How do its findings affect identity and the discourse of remembrance? And, finally, how does genetic history change other disciplines? The conference was organised into seven thematic blocks: »Genetics and History«; »Genetic History: Past and Future of a Discipline«; »Genetic History and Migration«; »Genetic History and Kinship«; and two case studies: »The Vikings« and »The Bantu«. The focus of the conference was thus genetic history's concern with the migratory movements of peoples²⁴ and languages²⁵, and its relevance for kinship studies. Genetic epidemiology, research on the historical origins and development of diseases, was left out.²⁶ The 2015 Berlin meeting could only be a first step. It is much too early to expect elaborate answers on the general questions and specific topics enunciated at the conference. But we are very happy that some of the participants have transformed their lectures into papers and have published them in this issue of *Medieval Worlds*. As the conveners of the conference we want to contribute to the issue by writing up some of our thoughts on why archaeologists, historians and geneticists should work together – and how. We do this in three steps: First we want to highlight again the potentials and limits of genetic history; then we present a short overview of genetic history research on a special topic, the Anglo Saxon migration to Great Britain; and lastly, we highlight different methods by which different disciplines might work together.

Potentials and pitfalls of genetic history

The geneticist Bryan Sykes from Oxford University – author of several books including *The Seven Daughters of Eve* and *Blood of the Isles: Exploring the Genetic Roots of our Tribal History*, and also creator of a commercial DNA ancestry testing company – has done more than almost any scientist before him to popularise molecular genetics as a tool for researching the past, both individual and collective.²⁷ Again, more than almost any other scientist, he extols the possibilities which he believes this research could unlock. The prologue to *The Seven*

24 On historical migrations as one of the main focal issues of genetic history see Feuchter, *Mittelalterliche Migrationen*.

25 E.g. by correlating recent and ancient DNA evidence with the spread of Indo-European languages. The works of Colin Renfrew (Renfrew, *Archaeology*; Renfrew, *At the Edge*; Renfrew, *Archaeogenetics*; Renfrew and Boyle, *Archaeogenetics*) are of particular interest in this context. Favourably disposed towards archaeogenetics from the very beginning, he seeks to link archaeology, genetics, and linguistics. For a critical view see, among others, Eggert, *Bantu und Indogermanen. On current results claiming new insights into the dispersal of Indo-European languages* see review article Novembre, *Human Evolution, and strong criticism by Heggarty, Ancient DNA and the Indo-European question*.

26 On this important field see Green, *Genetics as a Historicist Discipline*.

27 Sykes, *Seven Daughters*; Sykes, *Blood of the Isles*; the company is *Oxford Ancestors*, see www.oxfordancestors.com (retrieved on 14 September 2016).

Daughters of Eve amounts to a hymn in praise of genetics: »Where do I come from? How often have you asked yourself that question? We may know our parents, even our grandparents; not far beyond that, for most of us the trail begins to disappear into the mist. But each of us carries a message from our ancestors in every cell of our body. It is our DNA, the genetic material that is handed from generation to generation. Within the DNA is written not only our histories as individuals, but the whole history of the human race. With the aid of recent advances in genetic technology, this history is now being revealed. We are at last able to begin to decipher the messages from the past. Our DNA does not fade like an ancient parchment; it does not rust in the ground like the sword of a warrior long dead. It is not eroded by wind or rain, nor reduced to ruin by fire and earthquake.«²⁸ To be fair, it has to be mentioned that Sykes's efforts at popularisation and linking these with his own commercial enterprise have been heavily criticised by other geneticists.²⁹ Yet Sykes's basic claims – that DNA is a document containing »messages from the past« revealing descent and therefore identity, and that this document is superior, because more objective and stable than the usual historical (»ancient parchment«) or archaeological sources (»swords«, ruins) – are echoed by many genetic historians.³⁰ Human DNA is considered a biological »history book«.³¹ Its promise is that it »offers to unlock the past«,³² or, in the words of Alan H. Goodman, the era of genetics comes with a »supersaturated belief in the power of genetic knowledge to tell pasts and predict futures.«³³ Genetic Historians are undoubtedly correct in so far that genetics offers several advantages for historical research and may be used to answer some questions which could not have been resolved in the past using only traditional sources. From an archaeological perspective, for example, it might be possible to determine whether and how individuals in a burial site were related to one another, and to use this data together with archaeological findings and any available historical sources to develop new interpretations of the kinship structure of prehistoric and proto-historic societies. Additionally, genetic analysis of individuals can offer insights into their »physical biography«.³⁴ In other words, ge-

28 Sykes, *Seven Daughters*, 1. See analysis of Sykes approach to individual DNA genealogy in Sommer, »It's a Living History«.

29 E.g.: Bandelt *et al.*, *The Brave New Era of Human Genetic Testing*. For strong criticism of the claims made by individual DNA ancestry researchers see also Thomas, *To Claim Someone has ›Viking Ancestors‹*.

30 See for example the quotes by geneticists in Wolinsky, *Our History, our Genes*, esp. Rene Herrera: »[h]istory can get contaminated over time. But DNA does not lie« (ibid., 129).

31 »Every one of us is carrying his or her personal history book around inside us – we simply need to learn how to read it.« (Wells, *Journey of Man*, XVI, quoted after Abu-El Haj, *Genealogical Science*, 228). See also the observation by Abu-El Haj, *Genealogical Science*, 225: »We are witnessing the emergence of a new kind of ›source within: the genome as an empirical and legible record of our authentic, cultural, and historical selves.«

32 Wailoo *et al.*, *Introduction*, 5

33 Goodman, *Towards Genetics*, 227. Kristiansen, *Towards a New Paradigm?*, 17 sqq., recently spoke of a »third science revolution« in prehistoric archaeology, predicting a paradigm shift connected with the increase in »big data«, »quantification and modelling«, and the »theoretical power of new knowledge«; the increase in and integration of scientific methods (especially those of genetics) are central to his argument. Critical reactions were not long in coming; Niklasson, *Shutting the Stable Door*, 62, countered as follows: »Big Data does not mean better data; after all it is often just the same data linked up. It makes ›bigger‹ interpretations possible, which is great, but this does not equal ›better‹ interpretations, and importantly, just because it is true, it does not mean it is right.«

34 The media and the public sphere are eager for details of genetic analysis such as the colours of our ancestors' eyes and hair, which are believed to permit a »more authentic« reconstruction of their appearance, as in the case of Richard III mentioned above. However, the claim that the Iceman, the Hauslabjoch mummy, also known as »Ötzi«, had brown hair, is largely worthless from the perspective of cultural history.

netic analysis may be able to provide a variety of additional information for historians and archaeologists which would be inaccessible using conventional anthropological analysis (in particular, osteological analysis). Sometimes it may also correct or more precisely describe facts suggested by traditional historical and archaeological evidence that is flawed or vague.

However, hymns of praise like the one by Sykes quoted above somewhat obscure the fact that genetic history is itself beset with a number of problems that tend to circumscribe its capacity to deliver conclusive results. For instance, analyses of ancient human DNA have frequently involved contaminated samples. As a result, proper procedures for sample collection have become an issue of growing importance.³⁵ Indeed recently developed new techniques and methods are promising to resolve contamination problems and even to make it possible to extract DNA from human fossils found in conditions unfavourable to preservation. Yet even in a revolutionary »golden era« of ancient DNA research that has been proclaimed in recent years,³⁶ there is still the problem of uneven sample distribution. Earth burials were not allocated to everyone in past societies, and in many societies most or all bodies were burned. Questions of how representative buried individuals are for a whole population will therefore prevail, no matter how good geneticists are becoming at extracting DNA.³⁷ Another potential problem arises in the use of analyses of recent (»modern«) DNA to extrapolate from people living today to earlier populations. This method is potentially risky when applied to events such as the movements of large numbers of people during the Migration Period, »because it assumes extremely stable communities both before and after the events one hopes to study.«³⁸ In such cases, the models are dependent on hypotheses that are underpinned by statistical methods.

But the problems are not limited to technical issues. They also extend to the way research is organised and conceived. Until now, the new field has been dominated by scientists and geneticists claiming to do historical and cultural research. Archaeologists or historians are seldom among the authors, and even more rare are instances where they have contributed to the initial research design. The way many genetic historians work with history has been aptly described by Mark Jobling, himself a geneticist, as »cherry-picking« those facts from history that fit the hypothesis built from the DNA findings (while other facts are left out).³⁹ Thus the seemingly hard facts of genetics are often arbitrarily inserted into historical contexts.⁴⁰

35 See for example the advice of Brandt *et al.*, Beprobungsstrategien.

36 See for example Knapp *et al.*, Re-Inventing Ancient Human DNA; Gibbons, Revolution in Human Evolution; Cullotta, New life Life for Old Bones; Slatkin and Racimo, Ancient DNA and Human History.

37 On this see Deguilloux and Mendisco, Ancient DNA, esp. 127.

38 Geary, Using Genetic Data, 5.

39 »An additional problem is that geneticists who observe a pattern in their data and seek an explanation for it tend to visit a library, take out a history book and read about a past event that seems to explain the pattern they see. This kind of historical cherry-picking leads to a lack of objectivity in asking what kinds of past events could have given rise to modern genetic diversity« (Jobling, The Impact of Recent Events on Human Genetic Diversity, 794).

40 See also Egorova, Authentizität und historisches Gedächtnis, 53. There is always a certain subliminal biological essentialism at play in such cases; Schmidt, *Was sind Gene nicht?*, 318, calls for a change of thinking »from essentialist readings of genetic entities to an open, pluralistic concept« which, while not abandoning the genome as a crucial component of inherited patterns, nevertheless leaves open the question of which »factors and processes are essential for ontogenesis and which are accidental« (*ibid.*, 319; translation of original German quote by E.-R. Jaksch). This aspect has not featured in the discourse to date.

How important a close collaboration between scientists on the one hand and archaeologists and historians on the other might be is highlighted by a dating error pointed out by Eszter Bánffy, Guido Brandt, and Kurt W. Alt. They showed that a study involving DNA sequencing had incorrectly dated medieval individuals to the Neolithic period – which, of course, led to completely erroneous conclusions.⁴¹ Bánffy, Brandt, and Alt rightly concluded that »all efforts to produce authentic ancient DNA data are worthless if the archaeological background to a genetic project is missing or insufficiently explored.«⁴² While such glaring errors are admittedly rare, it is regularly the case that scientific results in general are not subjected to sufficient critical scrutiny by people working outside of the respective discipline but only competent in the historical era in question.⁴³ Rather, results are often accepted at face value by other disciplines and by the media. As genetic history widens its focus to include more and more »recent« eras (»recent« as opposed to pre-historical), and population genetics is now being used, for instance, to determine the extent to which England was colonised by the Anglo-Saxons and the Vikings, we must keep in mind that biological groups and archaeological groups are two different systems that cannot be regarded as necessarily equivalent, and that genetics cannot determine the membership of a given individual in a given social group.⁴⁴ Thus, a certain degree of restraint seems advisable, especially in view of the terrible consequences of linking race, language, and culture that occurred during the Nazi era, a dark chapter in the annals of disciplines such as prehistoric archaeology,⁴⁵ history⁴⁶ and genetics alike.⁴⁷ This is all the more necessary when references to blood ties with ancestors from thousands of years ago are increasingly becoming a dominant factor in discussions of the culture of remembrance and of social and cultural identity formation, and are leading not infrequently to attempts at instrumentalisation – especially when political and religious interests are involved.⁴⁸ Indeed, Keith Wailoo, Alondra Nelson, and Catherine Lee maintain that modern genetics does not only influence our thinking about the past or about a shared past, but rather, that it has »real effects in the present, for example, by impinging concretely upon the rights of groups within a nation-state or redefining the very boundaries of kinship and nationality.«⁴⁹ Some of these aspects are reflected in our following case study of genetic history research on Anglo-Saxon migration to Great Britain.

41 Bánffy *et al.*, »Early Neolithic« Graves.

42 Bánffy *et al.*, »Early Neolithic« Graves, 468.

43 See also the case of a mathematical error reported in Zimmer, DNA Study.

44 Siegmund, *Kulturen, Technokomplexe*, 53-54.

45 See Steuer, *Eine hervorragend nationale Wissenschaft*.

46 See Schulze and Oexle, *Deutsche Historiker im Nationalsozialismus*.

47 Weiss, *Nazi Symbiosis*.

48 See, e.g., the papers in Sommer and Krüger, *Biohistorische Anthropologie*; Reardon and TallBear, »Your DNA is Our History«; Scully *et al.*, Remediating Viking Origins; Abu-El Haj, *Genealogical Science*; Sommer, History in the Gene; Sommer, »It's a Living History«.

49 Wailoo *et al.*, Introduction, 2. Similar Lindee *et al.*, Introduction, 16: »Blood rewritten as genes provides powerful frames for kinship and identity, race and culture, history and the human future. What stories do genes tell? And what stories do we tell about genes and, in so doing, about others and ourselves, science and society, and nature and culture?« For this reason Goodman, *Towards Genetics*, 229 suggests: »Genetics knowledges, discourses, and practices are too important, too determinative, to escape critical study. What is needed is not an age of genetics, but an age of anthropology to think through the localness, partiality, instability, and context of genetic information. Genetics need anthropology to help fashion its questions and to make sense of its results.«

*Genetic history on the Anglo-Saxons, 2001-2016*⁵⁰

In June 2011 *Spiegel Online*, Germany's leading online news website, featured the article with the headline already quoted above: »Britain is more Germanic than it thinks.«⁵¹ The German author of the piece unequivocally told his readers: »It is now clear that the nation which most dislikes the Germans were once Krauts themselves. A number of studies reinforce the intimacy of the German-English relationship.« The studies in question were mostly genetic analyses of Anglo-Saxon migration from northern Germany to England. The Angles, Saxons, and Britons were proto-historic late antique and early medieval North-Western European populations whose names have come down to us in ancient written sources. However, these sources generally do not tell us conclusively whether these peoples were ethnic groups who believed they had a common ancestry, perceived themselves as a group distinct from other ethnicities, spoke a common language, acknowledged political leaders, or had developed a degree of cultural uniformity. Nor do the written sources reveal the extent to which any of these factors may have existed, the time that they emerged, or for how long they had endured. These questions are constantly being re-examined by historians from various different perspectives.⁵² Thus for historians or archaeologists attempting to study the field of ethnicities in proto-history, the point of departure is anything but straightforward. At issue thus is whether, and how, putative ethnic groups are reflected in archaeological finds and analyses. This question has been the subject to intense and, overall, controversial debate for decades.⁵³ In the case of the Anglo-Saxons and Britain, the discussion goes back more than a century.⁵⁴ Given this difficult state of historical and archaeological research, it is easy to understand the desire for a patent remedy – and this is where the methods of molecular genetics and palaeogenetics are brought into play.

The current state of Anglo-Saxon studies was concisely summarised by archaeologist Heinrich Härke, who noted in 2012 that efforts over the last decade had focused mainly on using palaeogenetics and isotope chemistry to distinguish the Angles and the Saxons from the autochthonous Britons.⁵⁵ Härke stressed that there were certain difficulties with trying to reconcile the new scientific findings with the findings of archaeology. For one thing, as we have noted, assigning ethnicities to archaeological discoveries is a fundamentally controversial issue. In this specific example, the task is to distinguish archaeologically between the Angles and Saxons on the one hand and the Britons on the other. He also pointed out that the extent to which a biologically defined population is normatively connected with a historical group of persons united by an ethnic and cultural identity remains an open question.⁵⁶ In the last fifteen years, various analyses of recent and ancient DNA have been published in connection with this topic. A start was made with a study in 2002. It first gave a summary of changing opinions in archaeology and history stating that the »use of migration as an

50 See also Samida and Eggert, *Archäologie als Naturwissenschaft?*, 42 sqq.

51 Schulz, *The Anglo-Saxon Invasion*.

52 See, e.g., the extensive treatment of the question in Kleinschmidt, *Migration und Identität*.

53 See for example Brather, *Ethnische Interpretationen*.

54 See overview in Lucy, *From Pots to People*.

55 Härke, *Entstehung der Angelsachsen*, 432 sqq.

56 Härke, *Entstehung der Angelsachsen*, 434.

explanation for cultural transitions has varied greatly over the past 100 years and remains controversial.⁵⁷ The authors then presented DNA evidence as an »obvious« contribution to the solution of this problem: »Genetic data comprise an obvious source of information to help resolve these issues.«⁵⁸ In its results, the study claimed to have proven that there was »Y chromosome evidence for Anglo-Saxon mass migration« (the title of the publication). Several other studies followed.⁵⁹ They presented differing results but had this in common: they each demonstrated the existence of genetic continuity – although varying from place to place – since the early Middle Ages. This is certainly an interesting finding, but from the perspective of archaeology and the study of the written sources of Anglo-Saxon history, the conclusions of population genetics do not amount to very much more than a general confirmation of the migration theory, which archaeologists and historians had good reason to favour all along. Thus the findings of DNA analysis have ultimately done no more than confirm a hypothesis that had long been on the table.⁶⁰ However, they are not particularly helpful when it comes to finding out *who* came into the country and *when* they arrived, or how the migrant Angles and Saxons were able to prevail against and impose their language and culture on the indigenous population. In this context, the theory, based on studies of population genetics, that early Anglo-Saxon England was characterised by an apartheid-like social structure between immigrants and autochthonous Britons, is favoured by Härke and others,⁶¹ but is the subject of heated debate.⁶² For example, John E. Pattison has stressed that the data used by Härke and others do not necessarily indicate the existence of an apartheid-like model.⁶³ The most recent analyses appear to confirm this objection. Genetic research of ancient DNA from individuals in the Oakington cemetery dating from the early Anglo-Saxon period have led Stephan Schiffels and his co-authors in a recent paper to come to the following conclusion: »we see evidence even in the early Anglo-Saxon period for a genetically mixed but culturally Anglo-Saxon community, in contrast to claims for strong segregation between newcomers and indigenous peoples«. ⁶⁴ These latest results show that early medieval migration patterns can take a large variety of different forms and that the integration of migrants was achieved in a number of different ways. Thus we will have to dismiss the notion of one-dimensional migration and mixing models. How England became Anglo-Saxon remains largely a problem of cultural studies, not of biology.⁶⁵

57 Weale *et al.*, *Y Chromosome Evidence*, 1008.

58 Weale *et al.*, *Y Chromosome Evidence*, 1009.

59 Most important: Capelli *et al.*, *A Y Chromosome Census*; Töpf *et al.*, *Tracing the Phylogeography*; Leslie *et al.*, *The Fine-Scale Genetic Structure*; Schiffels *et al.*, *Iron Age and Anglo-Saxon Genomes*.

60 »What all the studies do suggest is that Germanic people in their thousands did cross the North Sea after the end of Roman rule and that they did not all exterminate all the natives.« Grigg, *Genetics and the Anglo-Saxon Invasion* (no page numbers).

61 Thomas *et al.*, *Evidence for an Apartheid-Like Social Structure*; Thomas *et al.*, *Integration versus Apartheid*; Härke, *Die Entstehung der Angelsachsen*, 449-450.

62 Geary, »Völkerwanderung«, 50 put it as follows: »Such conclusions are then certainly plausible, but so much depends on the sampling technique, assumptions about ancient and modern migration, and assumptions about reproductive advantage that this theory remains hotly contested by many British historians.«

63 Pattison, *Is it Necessary*; Pattison, *Integration versus Apartheid*.

64 Schiffels *et al.*, *Iron Age and Anglo-Saxon*.

65 See Kleinschmidt, *Migration und Identität*, 24.

To sum up, it can be argued that the DNA analyses that have been conducted in connection with the Anglo-Saxon question have brought to light a number of new problems rather than providing answers to existing questions.⁶⁶ Thus it seems all the more necessary to strive for more, and closer, interdisciplinary cooperation in the future.⁶⁷

*On interdisciplinarity*⁶⁸

Some terminological clarification appears appropriate here. Four different modes of doing research are generally agreed upon: monodisciplinarity, multidisciplinarity, interdisciplinarity and transdisciplinarity. They are differentiated (1) on the involvement of one or more disciplines; (2) on the manner of input toward solving a given problem; and (3) on the degree of integration achieved in the process of cooperation. While monodisciplinary research need not be considered and transdisciplinary will not be described here due to its application-oriented nature, some remarks are necessary as far as multidisciplinarity is concerned. Commonly understood, it refers to a situation in which two or more disciplines engage in tackling a given task. The important point here is that each of these disciplines is largely self-centred in that it proceeds on the basis of its own methods and perceives the task from its proper perspective. In doing so, cooperation within the disciplines is minimal: they work side by side rather than starting from a common definition of the problem at hand, continually interacting as research progresses. Although each discipline profits to some degree from this kind of investigation, its overall outcome is essentially limited. Currently, this is, to our mind, the state of the art when we talk about collaboration between archaeology, history and genetics.

In contrast, interdisciplinarity is based on quite another perception of successful research. In this case two or more disciplines – each following its specific methods – practice a high degree of cooperation from the very beginning. This implies that the problem to be solved is analysed and defined jointly, each discipline bringing in its particular perception of the task and possible ways of solving it. This leads to a discussion of the conceptual frame of reference as well as of procedure, and the discussion continues whenever necessary as a (more or less) institutionalised structure throughout the entire research process. In other words, this mode of collaborative research hinges on a continuous exchange of ideas, insights and results while the investigation proceeds, or as Mark Pollard and Peter Bray put it some years ago: »It has to be an equal partnership, with a mutually intelligible language of communication, agreed objectives, and equal inputs.«⁶⁹ To put it briefly, there can be no interdisciplinarity without a genuine reflection on theories and methods in each of the participating disciplines. This, however, is the most basic prerequisite. Interdisciplinary research gets much more deman-

66 For an overall critical evaluation, see Grigg, *Genetics and the Anglo-Saxon Invasion*. Hedges, *Anglo-Saxon Migration*, 89 is sceptical that molecular genetics will be able to provide solutions at all in the foreseeable future: »It is more a matter of time, rather than of luck, for the molecular genetic methods to reach more definitive conclusions – though given the resources and knowledge needed, this may not be very soon.«

67 See Hofmann, *What Have Genetics Ever Done For Us?*, for similar conclusions for her field, Neolithic studies.

68 Some aspects outlined in this chapter are already published in Samida and Eggert, *Über Interdisziplinarität*.

69 Pollard and Bray, *A Bicycle Made for Two?*, 246. Quite similarly a few pages further on: »There are three fundamental keys to successfully riding the bicycle. One is a common goal [...], secondly a shared language, and the third, mutual respect – not simply personal respect, which is a *sine qua non*, but mutual academic respect. [...] Communication over a carefully defined question is the key. Integration cannot be defined just by the quantity of joint papers: It comprises discussion, meetings, conferences, and negotiation.« (*ibid.*, 255 *sq.*)

ding when it comes to collaboration with the sciences. This is due to the fact that the methodology of both is not only fundamentally different but, in addition, only rarely understood by the partners. Additionally, the problems are often linked to differences of epistemology of the participating disciplines, to differences in data acquisition and analysis, to difficulties in the project's organisation and management, and finally, to difficulties concerning the institutional frame (e.g., introduction of interdisciplinary approaches into university teaching, creation of new funding lines, training of referees).⁷⁰ The difficulties with regard to interdisciplinarity practice are manifold, and they are not only of an epistemological nature but are also located on a structural, institutional and actor-centred level. Cooperative research of the mode we are discussing here demands mutual knowledge exchange as well as a considerable measure of openness toward the participating disciplines, e.g., their theories and methods. Interdisciplinarity is not a kind of natural consequence of combined efforts to solve specific questions with a common project: »slipping into another discipline is not necessarily something that can just be ›done‹.«⁷¹ Rather, it has to be an ongoing process of interaction on all levels of the research involved.

Conclusion

We would like to end this introduction with an anecdote, which we gathered from Mark Pollard and Peter Bray who described the following, quite amusing scene: »At a meeting on scientific dating among the British some time ago, the technical difficulties associated with obtaining high-quality radiocarbon dates for archaeological research were being discussed at length, largely by radiocarbon specialists. After some hours of intricate technical discussion, a patient but obviously irritated senior archaeologist stood up and said, ›Archaeology is difficult, too!‹ Stunned silence descended. Clearly this was an aspect that had been lost sight of in the welter of technical details. This attitude is not the basis for an equal partnership«⁷² – and of course, one might add, this applies to both sides. Interdisciplinarity and integration comprises fruitful scientific controversies at all levels. This also applies for the emerging field of research described here.

70 See Fuest, »Alle reden von Interdisziplinarität aber keiner tut es«, 6.

71 Garrow and Shove, *Artefacts between Disciplines*, 130.

72 Pollard and Bray, *A Bicycle Made for Two?*, 255.

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