

Ancient DNA and contemporary politics

The analysis of ancient DNA challenges long-held beliefs about identity and history with potential for political abuse

Howard Wolinsky

In 1995, Pia Kjærsgaard co-founded the Danish People's Party (*Dansk Folkeparti*), which went on to become one of the most successful populist and anti-immigration parties in Europe. Kjærsgaard became Member of Parliament in 1997 and Speaker of Parliament in 2016. In September 2018, Kjærsgaard and three other MPs joined *Kulturnatten* (Culture Night), an annual event during which local cultural and political organizations in Copenhagen open their rooms to the Danish public and tourists. The MPs welcomed them to Parliament and, as a special treat, decided to undergo DNA testing and reveal their results live on television. Famed Danish ancient DNA researcher Eske Willerslev, Director of the Lundbeck Foundation GeoGenetics Centre at the University of Copenhagen, provided the commentary.

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As expected, the results turned out to contain a lot of “Scandinavian DNA”. But there were surprises in store for the Danish People's Party's MPs: They were not 100% “pure Scandinavian”. Kjærsgaard's was the “most Danish” of those tested: 78% of her genome has Scandinavian genetic heritage and a melange of British, general Western European, and Irish contributions. But the big surprise was her 3% ancestry from the Caucasus region. Kjærsgaard dismissed the result as a joke: “It must be a distant aunt who has had

a good experience on a holiday in Turkey. But that's okay—we can handle 3%”. However, Willerslev said Kjærsgaard did not display her true emotions in the interviews: “She was very professional and made a laugh of it on television, but after we came out and the cameras were not there, she certainly wasn't very happy about it”. The European media widely reported the story. “They thought it was kind of hilarious that the right-wing leader of the most right-wing party at that time was not ‘pure’ Scandinavian and had some Middle Eastern ancestry”, Willerslev said.

Denmark has a largely homogenous Nordic population, with sprinkles of immigrants, especially from Muslim countries, the very people the Danish People's Party would like to stay outside. Kjærsgaard resigned as Speaker in June 2019 after her party lost seats in Parliament as it was in part overshadowed by even more right-wing rivals. Welcome to the new right-wing populist movements in Europe, the USA, and elsewhere fueled by nationalism, anti-immigration politics, and racial prejudices (<https://www.bbc.com/news/world-europe-36130006>) and where extremists use and abuse the findings from genetics research to advance their political agendas and national narratives.

Rewriting history

Coinciding with the changing political tides is the rise of ancient DNA research that has been revealing ancient migratory patterns, common admixtures, and population diversity. This research has shown that the roots for everyone everywhere are in sub-Saharan Africa going back more than 60,000 years; that race is a social construct not based on biology; that human populations have always been on the move (sometimes in

massive migrations); and that *Homo sapiens* have mixed with not only with other *H. sapiens* but also with their hominid cousins Neanderthals and Denisovans.

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Johannes Krause, Director of the Max Planck Institute for the Science of Human History in Jena, Germany, and an expert in sequencing and analyzing ancient DNA, said this research is rewriting human history in sometimes dramatic ways. “What we can do now with our science is tell what we call genetic histories. So we can basically see how people in the past are related to other people in the past or to people that live in the present”, he explained. “And that allows us to tell whether there have been genetic changes, whether there were genetic turnovers, whether there were people moving from A to B in the past. And that has revolutionized a lot of time periods that archaeologists had been studying”, he said. For example, ancient DNA research showed a massive migration from Eastern Europe to Western Europe 5,000 years ago that completely changed the genetic landscape across Central Europe. “About 50% of the people living in Iberia got replaced by a mobile group of people that migrated from the steppes. And horses were domesticated—with horses came wheels and wagons and

Indo-European languages”, Krause said. All these changes were suggested by archeology but confirmed through DNA research.

This contradicts the worldview of racial supremacists and traditional cultures—as a result, modern genomic research based on ancient bones is triggering political debate from the UK to Native American tribes, from ancient graves in modern Israel to Neanderthal remains in Europe. Krause said some white supremacists now use their Neanderthal ancestry to distinguish them from Africans, because earlier *H. sapiens* encountered *Homo neanderthalensis* only after moving out of Africa. “Somebody should tell them that the Chinese have more Neanderthal genes than Europeans, so in a way if they really argue that way, then Chinese people are some kind of super kind of race”, he quipped. “It’s clear that from a biological point of view, races don’t exist. They don’t make any sense because there’s more genetic diversity within each population than between populations”.

The fight for the Holy Land

By far, the biggest stir was caused in 2019 by the analysis of ancient DNA from 10 skeletons in a gravesite in Ashkelon in southern Israel that 3,000 years ago was the home of the Biblical Philistines. Krause and his team compared the genomic data with Bronze and Iron Age people who lived ~3,600–2,800 years ago and found that most of these skeleton’s DNA came from local Levantine people. But those from the early Iron Age had European genes linking them to people living in the Mediterranean and Crete that were not present in earlier Bronze Age people [1]. “This genetic distinction is due to European-related gene flow introduced in Ashkelon during either the end of the Bronze Age or the beginning of the Iron Age. This timing is in accord with estimates of the Philistines’ arrival to the coast of the Levant, based on archaeological and textual records”, said Michal Feldman of the Max Planck Institute for the Science of Human History and lead author of the study. “While our modelling suggests a southern European gene pool as a plausible source, future sampling could identify more precisely the populations introducing the European-related component to Ashkelon”.

Four days after the study came out, on July 7, Israeli Prime Minister Benjamin Netanyahu reacted with a preemptive strike

against Palestinians who apparently might have used the results to claim priority on the land. He commented on Twitter: “A new study of DNA recovered from an ancient Philistine site in the Israeli city of Ashkelon confirms what we know from the Bible—that the origin of the Philistines is in southern Europe. The Bible mentions a place called Caphtor, which is probably modern-day Crete. There’s no connection between the ancient Philistines & the modern Palestinians, whose ancestors came from the Arabian Peninsula to the Land of Israel thousands of years later”, Netanyahu continued, to conclude that “The Palestinians’ connection to the Land of Israel is nothing compared to the 4,000 year connection that the Jewish people have with the land”. This set off a social media uproar of accusations, name-calling, and the typical twitter-storm. Krause, senior author of the paper, said he and his co-authors followed the debate but chose not to comment: “We don’t want to basically engage in a discussion with the Prime Minister of Israel on how to interpret science and history because it will not be a scientific debate”.

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Harvard geneticist and ancient DNA researcher David Reich, who spent a lot of time in Israel, said he was distressed by Netanyahu’s misuse of his colleagues’ work. “Citation of genetic research in this way to support territorial claims is a truly sort of abhorrent and non-fact-based perspective of the past. What he said was not justified even remotely by the genetic findings”, he said. “It’s really not clear who was there first. It’s very clear from looking at the genetics that everybody in the Near East today, Palestinians, Jews have a lot of ancestry from people genetically similar to early Canaanites”.

The abuse of science for politics

“[Netanyahu’s] ‘preventive strike’ is typical of politicians trying to use genetic data for

their contemporary purposes”, commented Patrick Geary, professor emeritus of medieval history at the Institute for Advanced Study in Princeton, NJ, USA. “In the same way, there are Palestinians who have argued that Ashkenazi are not the biological descendants of first-century Jews, and thus, unlike Palestinians, have no right to the territory of the modern state of Israel. This is a typical game of ‘who came first’”. He added that contemporary governments can subvert researchers and twist research to promote a national origin myth. “The situation in Hungary in terms of the misuse of genetic information is particularly acute”, he added, “We see the instrumentalization of science by Hungarian politicians”.

This controversy relates to a 2019 study of DNA from remains identified with King Béla III [2], who was one of the most prominent kings in the Árpáadian Dynasty at the end of the 12th century. Viktor Orbán, the Prime Minister of Hungary, has held the Árpáds as genetic evidence of the true origins of the nation, tracing them back to the warriors of Attila the Hun. “Now that seems incomprehensible to anyone who doesn’t know Hungarian history, but since the Middle Ages historians have debated whether the Hungarians were descendants of Attila and his Huns”, Geary explained. “However, since the early 19th century, linguistic evidence shows that Hungarian is part of the Finno-Ugaritic group that includes Finnish, Estonian and various languages spoken in Eastern Russia and Siberia, a finding that has long bothered some Hungarian nationalists who confuse linguistic, cultural, and genetic identities”.

The study was conducted by the Department of Pathogenetics at the Hungarian National Institute of Oncology and the Department of Historical Anthropology and Human Ecology of the University of Göttingen in Germany. The corresponding author was Miklós Kásler, a head-and-neck surgeon and Director of Hungary’s National Institute of Oncology and a close associate of Orbán. The researchers sequenced the hyper-variable region of the mitochondria and found that Béla belonged to haplogroup R1a, which is widely distributed across Europe and Asia and the most common haplogroup in populations speaking Slavic, Indo-Iranian, Dravidian, Turkic, and Finno-Ugric languages. But Kásler told *Magyar Idők*, a newspaper closely aligned with the ruling party, that the study showed that the members of the

Árpád House were Eurasian and not Finno-Ugric.

Orbán apparently used Kásler's interpretation to shore up his vision of Hungary linked to the warriors from the East. During a state visit to Kazakhstan, he said, "In the EU they treat us politically as equal partners. But based on our origins, we are alien when we travel to Brussels. [...] We have relatives in Kazakhstan. This is a strange feeling when one has to travel east when one wants to feel at home". Orbán subsequently appointed Kásler Minister of Human Resources in his government, and Kásler has created a new Institute for Hungarian Studies, which has raised concern that this institute is designed to "prove" the origins of Hungarians in the way that politicians want.

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Willerslev said he has found that some governments would not cooperate with his research because they do not want to contradict their interpretation of history. This happened in China where he wanted to test a population of long-dead Caucasian-like people. "We have tried getting access to the Tarim mummies from western China who look European, but I was told no, as it did not fit into the political agenda of all being the same in China", he recalled. "Same in Myanmar. Here, we did not get access because officials were afraid that results would not fit into agenda that all indigenous groups are closely related".

Geneticists not welcome

The case of the Kennewick man is an example of how researchers can upset traditional cultures and myths. It challenged the accepted wisdom on the origins of Native Americans and ended up in a protracted lawsuit with the US Army Corps of Engineers and local Indian tribes on one side and scientists on the other. In 1996, a couple of men found a 9,000-year-old skull on the banks of the Columbia River, near Kennewick, Washington. The tribes and the corps wanted to repatriate and bury the remains, while the scientists wanted to study the bones to explore their theory that the

Kennewick man was of Polynesian or Asian origins. They asked for an exemption from the Native American Graves Protection and Repatriation Act of 1990 that requires the return of "cultural items" to lineal descendants and culturally affiliated Indian tribes and Native Hawaiian organizations. The ensuing court case over the remains of the man who the tribes called the "Ancient One" lasted for 9 years.

The Army Corps of Engineers, the gatekeepers for the remains, brought in Willerslev to sequence the Kennewick man's genome. However, only one of the five modern tribes claiming the remains of the Ancient One, the Confederated Tribes of the Colville Reservation, allowed the scientists to extract and analyze their DNA with the understanding that the tribal members' DNA was not publicly available and that tribal permission was necessary if other researchers wanted to do additional analyses. In 2015, Willerslev and his colleagues reported that the Colville federation were among the closest living descendants of Kennewick man among the American tribes from which genome data exist [3]. In 2017, the skeleton of the Ancient One was returned to the tribes and buried in a private ceremony at an undisclosed location.

"Some scientists said it was just a political means for these groups to get attention to other problems and so forth. But this is by no means my experience", Willerslev recalled. "I have been participating in reburial of ancient human remains. It is private, only for the tribe, and I was invited because I did the DNA work, and they are burying human remains that might be 10,000–11,000 years old and they are acting as you and I would do if we were burying our mother". Willerslev explained aboriginal peoples, such as those he has worked with in Australia and Japan, are weary of researchers for good reason. "Many indigenous peoples around the world have faced massive abuse both by science and by everybody else in society", he said. "It was horrible in Australia. People were basically considered part of the fauna. They were shot as game until the 1930s. So scientists chopped off the heads, and boiled off the flesh and sent craniums back to Europe and the States. It's completely understandable that indigenous people are very skeptical towards these things".

The native peoples of North America have indeed good reasons to be suspicious of

Europeans and Americans who stole their land, tried to eradicate their cultures, and infected them with diseases. No surprise that many tribes harbor misgivings about scientists who too often played their part in exploiting them. In 2002, the Navajo tribe, which is politically semi-independent of the USA, imposed a moratorium on genetic testing: "Human genome testing is strictly prohibited by the Tribe, Navajos were created by Changing Woman; therefore they know where they came from". Kim TallBear, an anthropologist of science in the native studies faculty at the University of Alberta [Edmonton, Canada], noted in her book *Native American DNA: Tribal Belonging and the False Promise of Genetic Science*, "The creation accounts of indigenous peoples are serious business. They are historically, morally and spiritually (for lack of a better word) crucial to peoplehood". These stories often collide with the work of scientists who have traced the Native Americans back to Asia.

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"Science doesn't operate in a cultural vacuum, but it does exhibit its own cultural traits and particular histories and origin stories", explained Tallbear, who grew up on a Dakota reservation. "I don't have a problem with saying that we have genetic ancestry in Africa, but I totally understand why a lot of indigenous people are not really interested in the focus being on that story. They're rather interested in the focus being on how we have originated as peoples, how we have emerged as peoples with distinct cultures and very particular relationships to landscapes in the Americas". TallBear added that Navajos trained as geneticists are in discussions with community leaders to reexamine the moratorium. "They're actively working to think about how you can do genetic research at Navajo Nation in a way that's asking questions that they're actually interested in asking, instead of non-indigenous researchers coming in and imposing their questions and their priorities", she said.

Hindu nationalism

In October 2008, Reich was collaborating with colleagues in India to study human genetic diversity in South Asia, especially India, comparing genetic data from present-day populations with historic populations. “They were a mixture of two ancestral populations, one of which was relatively more closely related to Europeans, Central Asians and Near Easterners, and the other of which was less closely related to them”, Reich summarized the results. However, his Indian co-researchers were concerned that these results could be seized upon by Hindu nationalists. “It was clear that the issue of mixture between populations contributing in a central way to South Asians living today was fraught. If one was going to say something about a major genetic connection between South Asians and people living outside South Asia it would have to be confident about exactly what happened”, Reich said in explaining their caution.

In his book *Who We Are and How We Got Here*, Reich described the tough negotiations he had with his Indian colleagues. “We came to a standstill. At the time I felt that we were being prevented by political considerations from revealing what we found”. He said these were the “tensest” 24 h in his scientific career. He eventually called the two groups Ancestral North Indians and Ancestral South Indians without prejudging where they came from. “We just focused on saying these two groups, one of which was more closely related to European Central Asians and Near Easterners, and one of which was less closely related, mixed”, he said. “We chose our language carefully so as to be able to convey the scientific results we had without unnecessarily sort of interacting with sensitive issues”. Nonetheless, he said they still got blowback in angry emails from Indians who were offended by the results challenging their religious and ideological beliefs.

Not what it seems to be

If there is anything to draw from ancient DNA, it is full of surprises. This is the lesson from 9,000-year-old Cheddar Man, Britain’s oldest complete skeleton, that many inhabitants of Somerset came to think of as their neighbor, chum, and even relative. Cheddar Man was discovered in 1903 in Gough’s Cave in the Cheddar Gorge in an area best

known for cliffs, caves, and cheese and has been the subject of considerable scientific debate ever since.

In 1996, Bryan Sykes, a geneticist at the University of Oxford, extracted mitochondrial DNA from one of the skeleton’s molars. Its sequence analysis showed that Cheddar Man was a member of the common U5 haplogroup, which includes almost two-thirds of Western European Mesolithic hunter-gatherers [4]. Researchers ran mtDNA tests on a history class at a high school near the gorge and found that a history teacher and a couple of his female students shared the U5 haplogroup. People in the area celebrated their kinship with Cheddar Man, who became a local hero. The assumption was that he would have resembled most modern Britains with fair hair and pale skin. A statue for display in the Natural History Museum in London depicted him as a white man with a scraggly beard, a modern caricature of a Mesolithic caveman.

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In 2018, researchers from the museum exploded this stereotype using next-generation sequencing on a new DNA sample extracted from the temporal bone. Archeologist Tom Booth, one of the museum researchers and now a staffer in the Ancient Genomics Laboratory at the Francis Crick Institute in London, said the new findings suggest that Cheddar Man had a dark-to-black complexion, dark wavy or curly hair, and blue eyes [5]. The data also showed that Cheddar man was lactose-intolerant; he could not digest milk, which is a less common trait in Europeans. In this time of Brexit, the *Guardian* newspaper went to Cheddar to ask high school students their views of Cheddar Man’s new look. One 16-year-old said, “The fact that he has the darker skin tone reminds us that we are all one race—the human race. That’s what’s most important. We should all respect one another” [6].

Booth said the new Cheddar man evoked a variety of reactions: Some people readily

accepted the change in complexion, “[o]ther people just reject it and say it’s a hoax and it doesn’t make sense anyway. Sometimes, there is a kind of a fine line between the right-wing trolls who often accuse people on the left of saying we were using diversity in the past, whether that’s ancestral or kind of diversity in appearance, to justify multicultural immigration policies that we have today ...”. Booth said the left-wing have actually created this trap in which diversity shown to exist in the Roman Empire is used to explain and justify diversity in modern Britain. “We don’t need to use the Romans to sort of say they were diverse and that justifies us being diverse”, he explained. “It’s like our diversities justified by our history of empire, history of migration and acceptance of people from other countries and then contributing to the building of modern Britain, that is kind of much more important. And I think that’s what we should be emphasizing rather than saying we were diverse in the past, so we should be diverse now”.

Testing white supremacy

The “one drop rule”, was a social and legal policy in the USA under which any person with a single ancestor of sub-Saharan African ancestry was considered black. The principle was adopted in some US states in the early 20th century, but never made into federal law. The concept lives on among white supremacists who use commercial DNA tests to claim a “pure” white and northern European heritage. DNA testing companies in the United States promote the idea that testing can reveal surprises: A TV ad for Ancestry.com shows a man in lederhosen who thought he had German descent but who dons kilts when his test showed he was of Scottish ancestry.

Indeed surprises can be in store for test-takers, as the Danish MPs found. “Many in the white nationalist and newly emerging alt-right have flocked to the tests and encouraged others to take them, and online discussions of this trend exhibit a spirit of ironic provocation as alt-right users, for example, challenge each other to use a genetic ancestry test to prove they aren’t secret members of the ‘Jewish Internet Defence Force’”, commented Aaron Panofsky, a sociologist at the Institute for Society and Genetics, University of California, Los Angeles, who studied a popular alt-right website. “But, not infrequently, individuals post the shocking

news that genetic ancestry tests reveal some African, Native American, or Ashkenazi Jewish ancestry or other European groups deemed not white enough. Such results have led some opponents of white nationalism to propose, somewhat tongue in cheek, handing out genetic ancestry tests at their rallies to undermine their claims to white purity”.

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Panofsky has studied Stormfront.org, the largest right-wing website, where members celebrate when they are found “pure”, but despair when they are found not to be “all white” or “all European”. One alarmed poster in 2014 said his/her DNA results came back: 58% European, 29% Native American, and 13% Middle Eastern. “I am pretty sure Middle Eastern is Caucasian too, as well as European, so it means I am 71% Caucasian?” The negotiation did not work. One poster said: “Looks like you won’t be a member here anytime soon”.

Other posters suggest that DNA testing companies are promoting a diversity agenda reflected in their advertising and in customer reports as Panofsky and Joan Donovan reported [7]. Panofsky said the posters feel the companies are propagating a narrative of humanity that white nationalists think is untrue. “And that narrative is human unity, diversity, everyone should get along, globalization, stuff like that”, he said. “And [nationalists] don’t buy that story about humanity”.

Geneticist Yaniv Ehrlich, chief science officer for MyHeritage, a family history platform in Or Yehuda, Israel, which includes DNA testing, said he adamantly disagrees with claims that companies want to promote diversity *per se*. “We just report—we run the algorithms and we report whatever that algorithms provide”, he said, adding that surprises are not uncommon. Ehrlich, for example, is Ashkenazi on his father’s side but found that his mother’s family dates back several hundred years to an African woman who apparently was kidnapped as a slave, brought across the Persian Gulf, and

sold in what today is Pakistan. Her descendant turned out to be Ehrlich’s mother, a Jewish woman born in Uzbekistan who emigrated to Israel. “We know from 50 years of modern genetic research that there are no races really. Instead, there is a continuum of genetic variations among humanity”, he said. “Whatever the meaning of these variations, most variations don’t predispose you to any trait”.

Blood politics have also shown up in the 2020 US Presidential race. Senator Elizabeth Warren (D-MA) has long butted heads with US President Donald Trump over her claims that she has some Native American heritage. Trump charged that Warren used such claims as leverage in finding jobs where preferences were given to Native Americans and threw down a US\$1 million bet that a DNA test would show no Native American blood. Warren fought back and underwent a DNA test in 2018. A genome analysis in fact showed that she was mainly of European descent but also provided “strong evidence” of Native American ancestry 6–10 generations ago. The episode of DNA politics damaged Warren’s standing in the Native American community. There is no word on whether Trump paid on the wager. “Just because you have like a small fraction Native American ancestry doesn’t mean that she really can identify herself as Native American. Not really”, Ehrlich said.

Ignore or respond?

Susanne Hakenbeck, Senior Lecturer in Archeology at the University of Cambridge, UK, who has researched the politicization of research, said Netanyahu’s tweet on Ashkelon skeletons represented a volatile relationship between population genetics, overheated reporting in the media, and popular interests in migration and population origins that has been strengthening for some time. “It was a very clear political response to an arcane academic paper. The rapidity of that and the directness of that response was unique”, she said, “but the fact that a politician would use ‘scientific facts’ to make political claims was not”. Yet, archeologists, molecular biologists, historians, and other academics do not agree on how to react when their research is injected into political debates. “Who in the world wants to control social media for content and for correctness and for facts? [...] And I think that is very, very difficult”, Krause

said of his group. “It’s politicizing, and we have been installed by the government to do the science that we do ...”

Reich agreed and, like Krause, does not pay attention to social media commentary on his work. “I think the right thing for researchers to do is to ignore the great majority of what’s on social media because much of it is extremely low-level material and not serious material. It’s nearly impossible to have reasoned discussion in that space”, he commented. “We scholars have a space for reasoned discussion, journal articles that we write and respond to in an engaged and often intense way. Prompted by the wide interest in genetics and its occasional misuse, some of us have also written long-form books and essays whose primary intended audience is not our own colleagues, but instead scholars in other fields and the general public. I think that is the way that we should respond rather than in this social media world”.

“We can’t afford to simply say ‘We’re not political, we’re just scientists and it’s not our fault if others twist our work for political purposes’.”

Not everyone agrees though. Hakenbeck thinks that archeologists and geneticists need to be much more proactive about potential misrepresentations and responses to their work. “We can’t afford to simply say ‘We’re not political, we’re just scientists and it’s not our fault if others twist our work for political purposes’”, she commented. “Science doesn’t happen in a void; it’s part of society”. Willerslev sides with Hakenbeck when it comes to this misuse of research: “I believe we are obliged as scientists to fight fake news and get the stories out to the public that our data supports. In my view, this is among the most important obligations of scientists of our times. If we don’t do it, who can?”

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