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The Legacy of Hitler and Stalin

Though DNA research is advancing in huge strides, it is dogged by dark forces reminiscent of the totalitarian ideologies of the 1940s.

The voices that hark back to the Stalinist era are something I have been aware of for a long time. Such tones were commoner 20 years ago, when I started writing about the achievements of the new biotechnology. At that time, I quite often got readers' letters voicing sweeping prejudices against genetics. Fellow journalists would sometimes demonstrate a total lack of nuance, coming out with forms of words that might have been taken straight from Stalin's witch trials of biologists. I will never forget the time a cultural commentator who was prominent back then suddenly burst out – and this is a direct quote – that 'all geneticists are fascists of a kind'.

A visit to Russia's Vavilov Institute made me even more sensitive to that sort of knee-jerk criticism of DNA research. The Institute's premises, still a feature of central St Petersburg, housed the world's first major seed bank. When stem rust threatens wheat harvests worldwide, when the global climate heats up and drought becomes more widespread, plant breeders will be able to search seed banks like this for resistant genetic material to grow the crops of the future.

The Institute is named after Nikolai Vavilov, one of the world's foremost plant geneticists in the first decades of the twentieth century. He travelled on five continents, collecting seeds from wild species and traditional varieties from all the farming environments imaginable. One of the motives that drove him was the desire to end hunger and famine in Russia and the rest of the world. He sought to improve and secure food resources by collecting the raw material for new and better crops. But he was also passionate about fundamental research. He wanted to know where agriculture

was first developed. I have found myself thinking of Vavilov a good deal while working on the parts of this book that deal with the genesis of agriculture. If only he had had access to the new DNA studies on wheat, beans and other crops that have enabled today's geneticists to pinpoint the birthplace of early agriculture as the border regions of Turkey and Syria.

From 1924 Vavilov was the director of the seed bank in Leningrad, as the city was then called, and he also became the head of the genetics department of the Soviet Union's Academy of Sciences. However, in the early 1930s a young agricultural engineer from the Ukraine called Trofim Lysenko began to scheme against him. Lysenko claimed that the importance of genetic traits was overrated. Mendel's laws of heredity were mistaken, and environmental influences could, in fact, be inherited. Wheat and other crops would be able to adapt to the harsh climate of Siberia if only they were treated in the right way to withstand the cold.

Lysenko got the ear of Joseph Stalin, as his rhetoric was an excellent match for the prevailing Soviet jargon. Just as the new Soviet man and woman would develop under new, more favourable conditions, so crops would grow stronger, healthier and better in a socialist society. Genes were 'bourgeois' and 'counter-revolutionary'; environment was all. The working conditions of serious Soviet geneticists continued to deteriorate. Many of them were imprisoned in the 1930s. Vavilov was one of those who kept going longest, although he was clear in his criticism of Lysenko. But in 1940 he was arrested by Stalin's henchmen. He was imprisoned and sentenced to death. The sentence was subsequently commuted to 20 years' imprisonment, but Russia's greatest plant geneticist died of starvation in a gulag in 1943.

Leningrad was under siege by the Germans at that time, and was cut off for 900 days. At least a million inhabitants died, largely through starvation – nearly half the city's people. The staff of the seed bank guarded the collections with their lives. They could have made porridge from the oats and pea soup from the stores of dried peas. Yet they

did not do so. On my visit to the Vavilov Institute, I saw photographs of 15 members of staff who died at their posts during the siege.

Lysenko's erroneous doctrines damaged biological and genetic research in the Soviet Union, China and eastern Europe for many decades after that.

That is what springs to mind when I hear lazy, sweeping criticisms of genetic research. However, there is another side to this. There are DNA tests on sale in Hungary which, so it is claimed, can establish that the person tested has no Jewish or Roma forebears. A science journalist who used to be well respected, Nicholas Wade of the *New York Times*, with a background at both *Science* and *Nature*, recently published a book that makes a series of problematic assertions. These include his thesis that natural selection has resulted in differences in IQ, educational outcomes, political systems and economic development between different parts of the world. Over 100 of the world's foremost DNA researchers – including Svante Pääbo and Mattias Jakobsson from Sweden, Eske Willerslev from Denmark and the American David Reich – have signed a sharply worded petition in which they distance themselves completely from Wade's theses. They write: 'We reject Wade's implication that our findings substantiate his guesswork. They do not.'

These events hit me hard. Wade was a fellow journalist whom I once respected; he has worked on some of the world's leading science desks at the world's most highly respected journals. He has had access to the same published research on genes that I have been following over the last 20 years. And yet he has gone off on the wrong track. Despite everything, he has started to make claims about conclusions that scientists such as Pääbo, Jakobsson, Willerslev and Reich have certainly never drawn.

I have every confidence in the leading Swedish exponents of genealogical research. They show intelligence and discernment in avoiding the potential pitfalls of both genetics and ethics. Their shared websites contain rebuttals of commentators who draw any far-fetched or erroneous conclusions. They hone the

wording they themselves use, so as to avoid any overinterpretation or misunderstanding of their material.

Unfortunately, there are other blogs and discussion groups that are less scrupulous. Some of the most deplorable expressions I stumbled across came up when I was trawling the net for information about my paternal grandfather's haplogroup, R1a. There are a number of people out there in cyberspace who are trying to spread the notion that R1a is an 'Aryan' group and that those belonging to it have superior characteristics. Such voices are widely heard in India, but they occur in Europe too.

That is a very regrettable state of affairs – but it is not a reason to abandon DNA as a new and important tool for researching the origins of humankind. 'We can't let Hitler dictate what subjects we can research, 50 years on.' That was Svante Pääbo's riposte to the Senate of the Max Planck Society when they were discussing whether it would really be acceptable for Germany to set up a new institute for anthropological research, given the role the old anthropological institute had played in the Holocaust.

Instead, we must learn from history, says Pääbo. One important lesson is that science must be based on facts. It is essential that scientists work empirically on the basis of observations and experiments, not just theories; that lessens the risk of their being seduced by their own prejudices. That racist theories crop up is hardly surprising, given the human penchant categorising each other. But the new DNA research provides no grounds for such beliefs.

Pääbo refers to certain huge projects involving comparisons between the DNA sets of thousands of people from different countries and continents. These have cost a great deal of money, one estimate being US\$120 million (£99 million).

'What have we found out for all the dollars spent? Well, there are some local differences in skin pigmentation and variations in immune defence and our capacity to break down what we consume, such as lactose and alcohol. Thanks a lot – I already knew that,' says Pääbo. On the other hand, he continues: 'But maybe it's been worth spending all that money just because of what we *haven't* found. When it comes to the

way brain cells work, for instance, there is *no* difference to be found between different groups and countries. We know that today.'

Another of the researchers who has contributed most to the findings on which this book is based is Mattias Jakobsson. On my way to his office in the Centre for Evolutionary Biology on the periphery of central Uppsala, I walk past the *Dekanhuset*, which housed the State Institute for Racial Biology in the 1920s and 1930s. The building, which stands next to the cathedral and opposite the archbishop's residence, is owned by the National Property Board of Sweden. There is a small signpost in front of it with some information about the various activities that once took place there. For the years between 1869 and 1951, it states briskly that the premises were used by organisations including the City of Uppsala, Uppsala University and a primary teacher training college. There is no mention of any Institute for Racial Biology. Precious little seems to have been learned from history.

Mattias Jakobsson's office is just a few hundred metres from the location of the world's first Institute for Racial Biology. He has reflected a great deal on what he, as a geneticist working in Uppsala, can contribute with regard to that institute and the history of Uppsala University. He already holds regular popular science talks on genetic variation among people in different parts of the world. In the medium term, he plans to work together with experts in the history of ideas to set up a special course on ethics and history for students of genetics. Jakobsson shares Pääbo's view that scientists today should not allow their practice to be dictated by the actions of Hitler and the 'racial biologists'.

The Sami people, for example, were subjected to Herman Lundborg's quasi-scientific programme of cranial measurement. They were humiliated by being photographed naked and by offensive statements about race and innate disposition. 'But studying the origins of Sami people today shouldn't be any different from studying the origins of other Swedish people. It would be worse if we chose to avoid the issue by *not*

studying particular groups. Hopefully this will be a less sensitive issue in the future,' says Jakobsson.

In my view, private individuals should not avoid using DNA to investigate their own family history either, just because there are instances of abuse and misinterpretation. However, there are ethical problems one needs to be aware of.

The most obvious risk, as I see it, is that of unexpected and unwanted information about family relationships. I am thinking in particular here of cases where a person turns out to have a different father. Cases of mistaken paternity are not as common as is sometimes asserted; I have heard figures of up to 10 per cent, but that would hardly apply under normal circumstances. However, there are many children who have grown up with the wrong information about their father (or mother, though that happens less often). In such cases, the truth can come as a shock, not just to the person who has chosen to be tested, but to other family members as well. You need to be psychologically prepared for such situations before having a DNA test carried out. Moreover, many people looking into their family history persuade relatives to be tested, and it is even more important in such cases to think about the possibility that unexpected information might turn up.

Another theoretical issue is the possibility of information about hereditary conditions getting out. The first DNA test I ordered – carried out by the Icelandic firm deCODE – included information of that nature, though it was fairly general. deCODE has since gone bankrupt. 23andMe used to provide information both about the risk of various medical conditions and on family relationships, but the US Food and Drug Administration has since imposed limits on the medical side of their activities.

The genetic tests for family history researchers mentioned in this book are not designed to provide medical information.

My personal view is that historical and medical research should be kept separate as far as possible. Tests for serious hereditary conditions should be dealt with through the professional healthcare system, not by private individuals buying tests online. But what complicates matters is that a person with the right expertise could work out a good deal of information about the risk of various medical conditions by analysing the basic data included in more detailed family history tests. So there are good reasons to be careful with your password and about confidentiality in general, and to think twice before passing on any information to others.

A third risk is that DNA data may leak out into the public domain through human curiosity. Personally, I can't see why an outsider would want any information about my DNA. I don't think I'm that interesting. But people have different needs as regards privacy. Many chat away cheerfully about their private lives and thoughts on social media, while others prefer to be more circumspect.

There may be situations where a DNA sequence could have gossip value. If the haplogroups of the King of Sweden were made public, the newspapers would definitely write about the subject. But the articles would probably be short. The news would blow over in a day or so. Personally, I can only see advantages. If the Bernadotte family's Y-chromosomal DNA were public, it would put paid to shady businesses trying to peddle information about whether particular individuals are related to the king.

It is easier to foresee potential threats to groups that have been particularly vulnerable in the course of history, such as the Jews, Roma, Afro-Americans and Sami. But the fact is that DNA research into family history is often even more popular within ethnic groups that share a strong identity. There is a lively interest in the history of the group, and DNA tests can sometimes contribute information that cannot be supplied in any other way.

All DNA researchers – both the professionals and amateur researchers of family history – need to reflect on the possible ways in which their results may be misused. Professional

researchers have ethics committees that lay down codes of practice governing their work. But we amateurs also have ethical responsibilities we cannot abdicate.

In my view, turning aside from genetic research – in the spirit of Trofim Lysenko – is a very poor solution. The important thing is to inform ourselves, and to try and understand what our DNA sequences can tell us.