

## Min europeiska familj de senaste 54000 åren

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Race is a sensitive subject. It is closely related to the notion of blood. You have a very special relation to your parents and your children. They are in a very literal sense part of us. The intimacy of the immediate family is extended to the larger family, the village and the region, all of which to some extent are felt to be part of the same 'blood'. The rise of nationalism, in the sense of a people united by blood, and hence by common characteristics and character, can be attributed to romantically inclined intellectuals at the turn of the 18th century to the 19th. During the ensuing centuries it wielded a large influence in political rhetoric as well in political projects and visions. It was seen as progressive, pitting the will and destiny of people against the powers of dynasties and elites, and as such a backbone of the democratic movement. The aftermath of the First World War was to a large extent motivated by the notion of national revival, as a result intranational dynasties, such as that of Hapsburg, were disintegrated into its constituencies. It was in this context of every ethnic group being entitled to its own nation, in particular a piece of geography, which spawned the idea of Zionism, spurned by most Jews at the time. The ideas of nationalism and purity of ethnic groups leads to the idea of ethnic cleansing. Racism is based on the idea of ethnic groups being constituted by people related by blood and thus that their ethnicity has a biological basis, and in particular have distinct provenance. The ideas of racism were greatly enhanced by Darwinism lending itself to a multitude of vulgar and self-serving interpretations. If men were descended from apes, it was natural to think that different races such as Negroes and whites were descended from different kind of apes, thus that the racial separation went very long back, beyond the birth of man. Then the struggle for survival provided a more or less objective means of ranking the different races in terms of intrinsic value, this being what people nowadays refer to when they talk about racism. Europeans dominating the world and the authors of the most technologically advanced civilization ever naturally thought of themselves as superior, and that this very superiority was intrinsic to their blood. This became a very wide spread opinion, and it became the duty of biologists to give scientific support to those rather obvious claims, ultimately to explain them. Those claims were not the consequences of the work of biologists specializing in race, the conclusions were already there and widely accepted, the great sin of those scientists was to submit to popular prejudice and justify it, thus sinning against the sacred principle of scientific investigation, namely that of having an open mind and following wherever the inquiries lead and be damned. It is not hard to find modern parallels in putative scientific disciplines. There is now much venom directed against the race biologists and the fact that there was a prominent race institute in Sweden is seen as a source of shame. The fact is that the eugenics movement was strong up to and including the Second World War throughout the Western world and there was a wide political consensus. The author follows the pack and denounces Hermann Lundborg, admittedly not a very savory character, who no doubt not

only articulated common racial prejudice but carried it even further, and of course his sympathies for the Third Reich, shared in fact by many of his contemporary compatriots, does not exactly help his posthumous reputation. Still the indignities of being subjected to skull measurements (an attempt at empirical investigation) and photographed in the nude does not really compare to being hounded and massacred as have been the misfortune of so called indigenous people. Thus the lot of the Lapps seems very benign compared to say that of the American Indians, a fact more attributable to their peripheral position, presenting no obstruction to economical 'progress'<sup>1</sup> than to Swedish benevolence.

Now DNA and the concomitant genetic approach to humanity is as unabashedly materialistic as that of the race biologists of the past (in fact even more consistently so), thus spurned by many. After all there is a contradiction between an idealistic approach, say the equality between the sexes, and a genetic one, where one cannot *a priori* exclude the possibility of significant differences. Intelligence is a touchy subject, but as soon as you make a precise and measurable definition of intelligence there is bound to be differences across racial and gender lines, the point is not so much to question the results as their significance, in particular the relevance of the particular definition you choose. The author counters such vulgar opposition with the case of Lysenko versus Vavilov, the Soviet charlatan versus the classical Russian scientist, political correctness versus intellectual integrity, home-spun 'creationism' versus Darwinism and Mendelism.

The role of DNA in tracing your provenance is that of markers, not unlike what you do when you use isotopes to trace origins, the actual DNA is for all purposes meaningless. In fact, although we are determined by our genes, the way this is done, is not understood at all. One knows that genes code for protein productions, but how this actually translates into properties of the phenotype is something quite different. In fact there are far more properties than there are genes, so complex behavior depends on a large combination of genes coupled with an intricate interaction with the environment. The only thing one can do is to establish correlations between certain genes and certain simple properties<sup>2</sup>. In fact the applications of mapping the entire human genome have been far less significant than initially wished for. In particular the two most common markers the mitochondria and the Y-chromosome contain very little genetic information (especially the mitochondria), but they are technically easy to determine and thus amenable for large studies. Mitochondria is transmitted by the mother, and the Y-chromosome by the father. Thus you can in a sense trace your maternal line and your paternal line. Thus you always share chromosomes

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<sup>1</sup> True the development of hydro-electrical power has involved serious intrusions affecting the indigenous life-style negatively, but perhaps even more so the pristinity of a traditional wilderness. Nowadays the Lapps enjoy many privileges in order to sustain their traditional way of life, for which they have not whole-hearted enthusiasm

<sup>2</sup> In fact this is what animal breeders and plant cultivators have been doing since time immemorial, admittedly not at the level of genes, but on the level of phenotypes. In particular one cannot design a gene from scratch and predict what properties it will have, i.e. how it will influence the phenotype. In fact the result of the gene will depend on in what genetic context it will find itself, as properties are the result of complex configurations. Nevertheless there are examples of genes which act fairly independently, thus having similar effects across many species. It is those intermittent examples which make the headlines and are easy to interpret and take to, adhering to a more vulgar and accessible interpretation of genetics.

with your fathers line, but in general with few of your ancestors when you go back more than seven or eight generations (the same thing holds of course for your future progeny)<sup>3</sup> thus if you would have a Black ancestor seven generations back chances are that you would not share any chromosome with him or her, and thus from a racist point of view most likely to be 'clean'<sup>4</sup>. Now you can derive a lot of basic information with almost no empirical input beyond the most basic and obvious. One we have already referred to, and is also referred to in the book, namely that there is bound to be overlaps among your ancestors. Any ancestor can be encoded by specifying the route back, but there may be several ways of achieving that. As marriages between second and third cousins are not unheard of in small communities those overlaps occur at a fairly low level, meaning few generations back. Inbreeding is not in general a good thing, and here are in all societies string taboos against sexual relations between close relatives, but first cousins do not usually count as close. Interbreeding is bad as many dysfunctional genes are recessive, meaning that the

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<sup>3</sup> A human has 46 chromosomes coming in 23 pairs, one chromosome in each pair coming from your mother, the complementary from your father. When it comes to your grandparents, normally all distinct, each average one fourth, but in principle it could be anything between zero and a half (all or none of your chromosomes coming from your mother may come from your maternal grandmother). The number of ancestors grows exponentially with each generation, but as the human population does not when you back in time there is bound to be overlaps, meaning that people mate who have common ancestors. If we go back six generations and assume that all ancestors are distinct we have 64 individuals to share 46 chromosomes, thus some inevitably are left with none. And six generations can mean anything between 150 and 200 years, beyond this you have no relations to your particular ancestors while of course there will be some, a diminishing number, sharing one chromosome with you. In particular if you are a male you share the Y-chromosome with your father's father's etc father. The genetic material in the mitochondria is as noted negligible when it comes to your phenotype. A similar analysis shows that you share on the average one eighth of your chromosomes with your first cousins, one in thirty two with your second cousins, so in a sense you are not related to some of those, and only to a minority of third cousins. On the other hand a very large percentage of your genetic material is shared with other humans, meaning that the alternative chromosomes at the appropriate sites are very similar. There is a fairly limited gene pool from which your ancestors are normally drawn, which means that third cousins in general are not more related to each other than with other people in the same general population. Although race is a human construct and it is impossible to draw strict boundaries within populations that can interbreed, we can nevertheless get some measure of genetic distance between individuals, by looking at the genes. Two typical Scandinavians obviously share much more genes than either would do with an African pygmy. This is a biological fact. On the other hand humans are very genetically similar to each other than what is common among mammalian species. If you would have a child with an African pygmy, you would share more chromosomes with it than with anyone outside your immediate family, but less genetic material than you would with a fellow compatriot. Who is closest to you as far as 'blood'? Instinctively you would opt for the traditional convention, if you were a consistent racist you would opt for the latter and view your offspring with distaste as something alien to you.

<sup>4</sup> In der Dritte Reich Jewishness was erroneously thought of as genetically determined. Similar computations must have guided their rules as to being a Jew, but I guess they were not as exacting, anything beyond the third generation was considered negligible, maybe because it was in general hard to carry on investigations beyond that.

bad effects are only manifested when they are present at both chromosomes at a site, the risk of so being, the greater the closer the partners are related. Thus typically in traditional societies people seek mates outside their villages, even among foreign tribes, speaking different languages.

Another game you can play is to consider a group of people, say all living ones. Then you take the set of all mothers to those. This set will necessarily have a smaller cardinality than the original set. To each person there is a unique mother, but a woman can have many children. Now you can repeat the process, mathematically indefinitely, in practice not as life on Earth only goes back finitely in time and sooner or later the notion of mother will fade away. Combinatorial reason only carry you so far. In particular you cannot conclude from this type of argument that at some time there was only one 'mother' left (appropriately called Eve) and that she was human. The point is that all living people share the same mitochondria as Eve. Similarly using fathers instead of mothers you end up (it is never explained how) that there will be a human Adam, whose Y-chromosomes are shared by all living men. Now this Eve and Adam never mated, probably did not live at the same time nor at the same location, it is just that of all their contemporaries they were the only ones who had unbroken lineages, of daughter's daughters or son's sons. Thus the probability of having an unbroken line asymptotically is very small. As time goes by the role of Eve will be taken up by some one of her female descendants as more sublineages will die out.

Now the transmission of genetic material is not perfect. There are invariably mistakes in copying and actual changes in the interim. Those changes are known as mutations, and thus the various mitochondria among people actually vary. The greater the differences between two mitochondria the longer back is the common maternal ancestor (similarly for Y-chromosomes and paternal ancestors). In this way you may be able both to time the splittings given a steady mutation rate<sup>5</sup> and to get some idea of your geographical origins, thus giving clues as to the migration of people in the past, this being what may excite people the most and hence being the main subject of the book.

To start from the beginning. Recent advances in the paleontology of DNA investigations stem from the technical feat that you can sometimes extract genetic information from literal remains of organisms. This points to another issue not addressed by the author. Technically a fossil is a faithful replacement of the remains of an organism, where perishable material has been replaced by minerals in a fortuitous process that seldom occurs. Thus each fossil is a kind of precious miracle of which there are comparatively few, otherwise if every organism which had ever lived would be fossilized we would be buried under mountains of debris<sup>6</sup>. Thus one hardly expects to be able to extract DNA from dinosaur

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<sup>5</sup> When those ideas were first applied in the 70's one did not look at the actual DNA but at proteins, the idea being that those changes were evolutionarily neutral and hence proceeded at a constant rate.

<sup>6</sup> Take a Brontosaurus. Typically weighing 15 tons of which the bones made up a substantial portion, say for the sake of argument 10 tons. Assume a world-wide population of say 100 million individuals and a lifespan say of 30 years (this is of course speculation, but not entirely unfounded) and being around for say 30 million years. We are talking about  $10^{15}$  tons, as the surface of the Earth is about  $5 \cdot 10^{14}$  square meters, so we are talking about the entire surface of the Earth covered with Brontosaurus bones two meters

skeletons as those are not literal remains<sup>7</sup>. Thus the DNA techniques are limited to the geologically recent past. One remarkable thing is that Neanderthal genes have been found among European populations, but not in African populations. From this one has drawn the conclusion that modern human populations have met Neanderthal population, mated with them (whether voluntarily or not), and not only produced off-spring but fertile such, which technically means that they would have belonged to the same species, but to very distinct races, much further apart from each other than any two modern human races<sup>8</sup>. Now what is meant specifically with Neanderthal genes? Humans and Chimpanzees purportedly share some 98.6 percent of their genes, and for Neanderthals that figure would be much closer to 100 percent, not to mention the shared percentage among modern humans. Now one is only able to speak about Neanderthal genes from those extracted from actual remains. There are literally millions and millions of humans available to have their DNA extracted, and I guess that has been made for thousands, maybe even hundred of thousands, so one may get a rather fine-grained picture of the human genome, in particular its variations, while there are only a handful of Neanderthal remains to be quarried, and the picture we will get will be by necessity much more coarse-grained and not as complete. The reasonable assumption is that there have been some genetic material common or maybe always present in the Neanderthal samples but only seen among certain populations among humans. Another interpretation is that Neanderthals and humans have emerged from a common population meaning a common gene pool, but only a minority of modern humans have inherited a certain type of genes very prevalent among the Neanderthals,

Maybe the most interesting thing to be taken home from the reading of the book is that farming practices may have been imposed and thus spread by migrant farmers rather than by emerging independently among indigenous populations. This has been concluded by extracting DNA from the remains of farmers and hunters, distinguished by their types of graves. This also lends some credence to the assumption that the spread of Indo-European languages has actually been effected by migrations of Indo-European speakers, maybe even invasions. Now, reality is complicated and above all messy and arbitrary, and elements of both must have been present. Indigenous populations may simply have abandoned their old ways and means of communication in favor of new ones, with no need to replace them physically. It is hard to find definitive answers to such questions given the paucity of material.

The book is divided into three parts. The hunters, the farmers, and the Indo-Europeans, and each part in about a dozen or so short chapters with catchy titles and

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high. Add to those other animals, during different time epochs, and you realize that there is a high degree of recycling of material going on.

<sup>7</sup> Thus the prevalent fantasy has been to be able to extract DNA from blood samples sucked up by mosquitos preserved in amber (thus a case of literal remains)

<sup>8</sup> This raises interesting moral questions as to the status of Neanderthals in our society would they have survived into modern age. While human genetics gives no indication as to the superiority of any race, this might very well have been the case with Neanderthals. Any non-pathological child picks up the prevailing language spoken, regardless of its racial origin, it is far from certain that this would have been the case with Neanderthals, it is not even clear whether they would have been anatomically able to produce the variety of human speech.

easily digested by the reader. As to the first part, the latter is treated to visits to various Ice-age sites and caves, mostly in France. The style of the author to blend personal matters, such as travel and encounters, with telling the larger story, anchoring it in concrete realities to which the reader can easily relate. This part also includes speculations about how wolves were tamed and domesticized into dogs. Note that domestication is different from mere taming. Most animals can be tamed, but never reliably so, it is first when the genetic setup is modified as to comply to people, there is a true adaptation between man and beast. Dogs are wolves, but not tamed ones, but fundamentally different as they have become dependent on humans and genetically bred to be very much aware of human intentions<sup>9</sup>. Wolves are very much more independent than dogs, being indifferent to humans. Incidentally wolves and humans occupy similar ecological niches and show some striking convergent evolutions as to their group behavior. The notion 'top dog' is as applicable to humans as to wolves and dogs. Once again genetic tracing have been crucial in order to show new light on the story.

As to the second part the introduction of farming has been called the most farreaching of human inventions and social revolutions, and for the first time humans started to have a real impact on the environment<sup>10</sup>. Farming made it possible to sustain much bigger populations and at much bigger densities to boot which became a prerequisite for civilization. Not that it was consciously striven for, but much that underlies it turned out to be necessities imposed by the logistics of handling more complicated social relations which were not based on personal confrontation. It is speculated that before farming humans were much healthier and lived longer<sup>11</sup>. It was after that metallurgy developed, with copper then copper alloy as bronze came to the fore. This meant a further economic stratification of society, as copper and tin were hard to come by. Of course the discovery of iron, much more generally available changed all that. One chapter is devoted to the tzi man, the chance archeological find that have given us the best window so far on that age (but of course only pertaining to a single individual having to carry a large burden, but this is typical of paleontology, that scant evidence has to be carried a long way in order to satisfy our insatiable curiosity).

The final part deals with the Indo-Europeans and their purported war-like character, as among other things manifested by their axes, interpreted as battle axes. Interestingly they are connected to the domestication of the horse, and its ramifications such as the wheeled chariots. Horses do lay an important role for the nomads of the Old World (in the New World they had died out before the advent of man, but the nomadic tribes took to them more or less immediately once they were reintroduced by the colonialists). How they spread is another question, were our ancestors in the North predominantly speaking

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<sup>9</sup> One may even speculate that humans have to some extent been domesticized to dogs being attached to them, and like dogs reading into them characters of their own species, although neither humans nor dogs show any disposition to mate with each other, such attempts doomed to be unsuccessful, and in this regard they do not confuse each other.

<sup>10</sup> True ice-age hunters did have a major impact in the extinction of ice-age mega-fauna, fragments of which has only survived on the African continent.

<sup>11</sup> It has been observed, by among others Diamond, that in so called traditional societies there is a high incidence of violence, as well of course accidents, but people do not die as much from diseases.

a Finnish type language, or did they come indeed from the Asian interior. What is sure is that it spread in all directions, in particular that Hindi and Persian are part of the same general family. Very recent research on Y-chromosomes indicate that one should interpret its spread literally, a large proportion of European men have such chromosomes emanating from the east. The part more or less ends with a chapter on the vikings, whose reputation for ferocity, no doubt was based on their indifference to the sacredness of churches and monasteries, not sharing the taboo upheld by the Christians. Once they got 'tamed' by conversion to Christianity, their menace as well as their reputation for ferocity was gone, and thereby the romanticism of the North. As the author notes, all along their warlike characteristics were exaggerated, in reality they were for the most part peaceful traders, but such things hold scant fascination. The book ends with a more personal investigation of her immediate ancestors, traces of which end in the 17th century, by which time our genetic relation to most of them has disappeared. There is a chapter on the legacy of Hitler and Stalin, presented as opposite. Hitler putting overdue emphasis on blood and Stalin denying it altogether, championing the politically correct ideas of Lysenko at the expense of Vavilov, to the detriment of Soviet agriculture.

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