

Wisdom in the Bones: How Ancient Human Genomes Overturn Myths About Race

Theodore Parker Unitarian Universalist Church

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A commitment to racial justice runs through the metaphorical DNA of our congregation, going back at least to the illustrious career of our namesake Theodore Parker himself more than 150 years ago. Over the past year, we have maintained a special focus on this issue, both in the fine work of our Racial Justice Task Force and through our support of the Black Lives Matter movement, symbolized by the banner now flying outside our church sanctuary. But what is race, exactly? Listening to what people say across the country and in the world makes it abundantly clear that different people have very different ideas about what sort of thing it is when they talk about race. If we, as religious liberals, hope to make a difference in promoting racial justice, we must be clear among ourselves and in our messages to the world at large what we mean that race is ... and is not.

Back in the days when we were a smaller congregation with a smaller budget, in order to make sure that each Sunday could provide a service that was spiritually fulfilling, the Music and Worship Committee, of which I was a longtime member, had to arrange a substantial number of lay-led services for Sundays when the minister was not available. In that setting, having spent many years as a research scientist myself, I led for about a decade an annual service on the theme of "Science and the Spirit," covering areas where modern scientific understanding of the natural world and particularly the biological world could help inform our sense of our spiritual place within it. I thought of this as the "Fifth Source Project," referring to the fifth of the six official sources of our Unitarian Universalist faith (complementing the seven principles), which reads: "Humanist teachings which counsel us to heed the guidance of reason and the results of science, and warn us against idolatries of the mind and spirit." I had service titles like "Sex and Death" (which led to some interesting discussions about what should go on the signboard out in front of the church). The last of these, at least as a major production, was our Darwin service, almost 10 years ago now, celebrating the sesquicentennial of the publication of the *Origin of Species* in 2009, where the sanctuary was festooned with models of creatures great and small that the children had decorated as part of the Religious Exploration projects to go along with the service.

When I mentioned this tradition to Rev. Anne, she suggested it might be time to revive it, and I thought that given our racial justice focus an appropriate theme might be to recall the dark memory of the American eugenics movement, where eminent American scientists, far from being beacons of enlightenment, were actually major proponents of racist ideologies and practices such as sterilization of "unfit" young women. In particular, I planned to discuss the accounts in Stephen Jay Gould's classic, *The Mismeasure of Man*, where he shows how otherwise brilliant scientists fooled themselves into misinterpreting scientific evidence to support their emotional convictions of racial superiority. This may still be a worthy topic to return to at some point, but two things changed my path. First, a subscription to the genome sequencing company, 23andMe, that my daughter Caitlin had given me a few years back started to bear fruit with the appearance in my email of occasional notices from people who were second and third cousins by DNA but of whom I had no prior knowledge. I had originally hoped that my DNA

genome sequence would reveal some interesting or exotic aspects of my family ancestry. Alas, the data seem to show that it's just Irish all the way down. According to 23andMe, my ancestry was greater than 90% Irish/English, with about 6% French, and the only other detectable fraction being the next most common at 2% Neanderthal. Not sure what to make of that.

The second event that induced me to change course was the pre-announcement of a new book by Harvard geneticist David Reich called *Who We Are and How We Got Here*, where he describes how a revolution in the technology for analyzing DNA sequences from ancient human skeletal remains has over just the last 10 years largely overturned our previous understanding of the history of human races. He has made the very important point that in order to confront racism, we should have an accurate, biologically informed understanding of what race is, in part because well-meaning but inaccurate theories are easily refuted by those with a racist agenda. Only sound science backed up by good data can truly form a lasting bulwark against false theories.

Arthur C. Clarke famously formulated his three laws of scientific progress, the most widely cited being the third: "Any sufficiently advanced technology is indistinguishable from magic." This can hardly be more true than with advancements in determining DNA sequences from ever older and smaller pieces of bones from human remains tens of thousands of years old. Despite what you may have gleaned from "Jurassic Park," doing these analyses from thousand-year-old, let alone million-year-old, samples would've been fanciful until just the last couple of decades. And like any revolutionary new technology, like a microscope or telescope that lets us peer into heretofore unseeable worlds, we find more there than had been dreamt of in our philosophies.

One of the first of these came in the attempt to unravel the genetic history of Native Americans, whose archaeological remains first appear widely in North America about 14,000 years ago. The expectation had been that analysis of DNA from these ancient remains would show them to be most closely related to current populations in Northern Asia, from where they could've walked across the Bering Strait during the last great ice age. Instead, what they found was that ancient Native American DNA was roughly equally related to Asian and Western European populations. This was a puzzle, until it was realized that these data would fit if both European and Native American populations were related in turn by mixture with another population, another "race," that no longer existed and was unknown to archaeology. Not long after that, bones from a gravesite in Siberia revealed genome sequences exactly as predicted from this ancient North European "ghost race," a tall, dark-skinned, blue-eyed people, who lived across the Northern Eurasian landmass around 17,000 years ago, and who were every bit as distinct and prevalent as the current races we see today, but who have completely vanished from current populations. Further progress in genome sequencing from human archaeological remains across the world has shown a similar pattern again and again, in East Asia, the Indian subcontinent, and Africa: races of people as distinct as the races today but different from them, current races being mixtures of these ancient races, which have now vanished, only detectable by the traces they have left in our DNA. This was the first major clue that genetic groupings of people are a pervasive feature of human history, but that the groupings are not fixed but fluid, changing over time.

The next major overturning in the understanding of the history of European populations came from tracking the spread of the people about 5,000 years ago who carried with them the family of

Indo-European languages both into Europe and into what is now India. This culture, the Yamnaya, were herding people, who developed horse-drawn wheeled carts and bronze tools and weapons that seem to have allowed them to overcome pre-existing populations over a large swath of the Western Eurasian landmass. When this genetic data was first being readied for publication, some of the co-investigators from India strongly objected and several from Germany actually resigned from the project because it seemed to be confirming the Nazi ideology of an "Aryan" sweep of a "superior" light-skinned race across Europe and India. Instead, however, the data revealed something more complex, and more similar to what had happened over 10,000 years before with the ancient North Europeans. The Nazi mythology of a genetically pure, blonde, blue-eyed superior race spreading from Germany was just that: a myth. Genetic analysis revealed that the Yamnaya were instead a brown-haired, brown-eyed, light-brown-skinned people arising in what is now the Ukraine, and who themselves had arisen as a mixture of previous ancient North European hunter-gatherers with a farming people who had spread north from what is now Iran. Horror of horrors, the "Aryans" were a "mongrel" mixed race. The whole idea of racial "purity" is simply false as a matter of history, a perverse attempt to twist what the archaeological data actually show to fit a pre-existing racist agenda. Modern DNA data show clearly a truer vision: we are all of us of mixed ancestry multiple times over.

There are many other eye-opening insights coming at a rapid pace from these studies, from the history of humanity's first great deep-sea sailors, the people who settled the Polynesian islands, to the great civilizations of the African continent, most notably the world's first large, long-lived empire in Egypt. It is still early days with this work, and much is yet to be learned (which will no doubt continue to surprise us). One further feature of the data on mixing is worth noting, however. The genetic data can show us not only when and where the people live, and roughly what they looked like, since the genetics of features such as hair and eye color are well understood. It also shows us from comparison of maternal and paternal inheritance the mixing has sometimes been very asymmetrical. In the mixing of the Yamnaya herders with the farming and hunter-gatherer populations into which they spread, a greatly disproportionate amount of inheritance they left was along the male line. A similar pattern is seen in northern versus southern population mixtures in the Indian subcontinent, in the relative contribution of European versus Native American ancestry in South America today, and—most relevant to the history of our little part of the world—of the world here: On average, roughly 20% of the recent ancestry of African-Americans is European in origin, and of that nearly 80% comes down along the male line, dating to before the American Civil War. Clearly, the genetics sometimes tells tales about history not recorded in official accounts.

The overall picture, though, is important to remember: The intuitive sense that humanity is overall clumped into groups of sizes great and small, from families, to clans, tribes, nations, and races is borne out by our rapidly advancing DNA technology, but it shows us at the same time that the simpleminded interpretation of this as immutable differences among people is simply wrong. Human ethnic and racial groups are and have always been shifting, fluid, and fuzzy around the edges. The attempt to misuse the visible physical markings of human genetic differences as a way to put one group above another has everything to do with some of the darker parts of human psychology—a subject I'm not really qualified to comment on—but little to do with the reality of actual human biology, where these differences are a dynamic source of human variety, with groupings shifting over time.

The paleontologist Stephen Jay Gould argued that our mental iconography can strongly influence our thinking, sometimes in perverse ways. The pervasive—and biologically false—image of the great chain of being, with a lowly ape gradually rising to an upright, typically white, modern human, likely contributes to a racist way of thinking. By the same token, the picture of the family of humankind as a great tree with branches springing from branches is a major advance toward a fuller understanding, but it is still misleading, because it implicitly implies that the branches are forever separate from one another even if they arise from the same root. I do not have a perfect replacement for this analogy, but I think with respect to human racial and ethnic groups, a better image is the iconic lava lamp, where human populations, like the colorful blobs therein, are shifting and changing over time, rising and falling, mixing and splitting, always grouped, but with the groups changing in a way that makes for a rich and fascinating ongoing process rather than a static division into unchanging parts.

I mentioned that part of what started me thinking about this particular subject was a gift subscription from Caitlin to have my genome sequenced. When I read David Reich's book, *Who We Are and How We Got Here*, he mentioned contacting the company that had sequenced my genome, suggesting corrections and clarifications in some of their analysis, based upon his own work in studies of human genetic diversity. Intrigued by this, I went back to the 23andMe website and saw that indeed their summaries have been updated, including mine. It told me that most of my maternal ancestry came from the dark-haired, blue-eyed hunter-gatherer population that had lived in Western Europe more than 10,000 years ago, but that most of my paternal ancestry came from the Yamnaya, who had spread out from the central European steppe 5,000 years ago. And, it told me, like about 8% of all men of Irish extraction, my Y chromosome derived from Niall of the nine hostages, a great medieval Irish king from about the fourth century of the Common Era, the lineage that gives us the Irish name, O'Neill. It is an at once humbling and somewhat exhilarating feeling to have one's own personal ancestry connect to the great sweep of human history.

Along with all this fascinating new data, I think it's important to point out as well that in addition to overturning perverse racial mythologies, they confirm some crucial older insights: no matter what the data show about genetic differences between human populations, a large majority of the genetic diversity of humanity is not between groups but between the individuals within each group. Further, a large majority of all the genetic variation of human groups is not between what we think of as current human races, but rather lies within the peoples living now in Africa, the ultimate ancestral home of all humanity. We are all Africans, differing only in how recent our ancestors there were. And all the variation among all the people in the world is in turn dwarfed by the differences between us and our closest relatives, the Neanderthals, who, archaeological evidence would suggest, were every bit as human as us in all the senses that matter. Finally, most of what we care about in one another it is not genetic at all, arising not from our genes but from the divine spark of our human spirit. Still, just as an appreciation for the wonders of the natural world is a principal Source from which we seek wisdom and spiritual nourishment, so too is a clearer, more accurate scientific understanding of that world, including ourselves as part of it. In that Light, the light of the great Lava Lamp of human peoples, we can stand up, together, embracing human diversity as a rich and wonderful part of who we are.