
David Mumford

Archive for Reprints,
Notes, Talks, and Blog

Professor Emeritus
Brown and Harvard Universities
David_Mumford@brown.edu

[HOME](#) [ALGEBRAIC
GEOMETRY](#) [VISION](#) [BEYOND
RESEARCH](#) [ABOUT](#) [BLOG](#)

Nothing is simple *in the real world*

July 8, 2020

Mathematicians and politicians have one thing in common: they both thrive on oversimplifying aspects of the real world. If there is one thing that a college education should teach every student it is that there are two sides to every question, that the world is not simple, that good and bad are not reducible to checking who is wearing a white hat, who a black. Mathematical models are based on isolating some effects, some aspects of a very complex real world situation and modeling this simplification. Political rhetoric is pretty much the same. The sad thing is that not only left and right wing activists vastly oversimplify the challenges our society faces but that now radical students at elite universities are so carried away by partial insight that they lose sight of the ideals of an open society. In this short post, I want to wade into two heavy duty issues that are often over-simplified: slavery vs. human rights and eugenics, the discussion of which provokes the strongest emotions. They are related as both have been supported by racism, justifying the enslavement of another race and regarding any people of mixed blood as equally inferior.

I

Because the roots of both these topics are really old, it makes sense to start with the ancient Greeks, specifically Athens in all its 5th century BCE glory. Point #1: according to Wikipedia, the households of all but the poorest citizens of the city had three to four slaves. This slavery was

an essential support for the amazing and unique cultural explosion that took place there, extending over the fields of literature, math and philosophy. It is not only slavery that was considered natural and inevitable there, but, point #2, we also find in Plato's *Republic*, Socrates' description of the importance of eugenics in his ideal state. After a discussion of the value of selective breeding in domestic animals, Socrates says it is only logical that the same principles apply to humans:

On the basis of what has been agreed, there is a need for the best men to have intercourse as often as possible with the best women, and the reverse for the most ordinary men with the most ordinary women; and the offspring of the former must be reared but not that of the others, if the flock is going to be of the most eminent quality. And all this must come to pass without being noticed by any one except the rulers themselves if the guardians' herd is to be as free as possible from faction.

(Book V, 459a, translation by Allan Bloom). Of course, both slavery and eugenics are considered now to be the worst possible sins that a society can commit. Should we then mentally assign Athenian society to the deepest levels of hell, burn its writings or, at least, rewrite them to hide its intolerable ideas from the eyes of the next generation? Obviously not: our job is to understand how that society thought and how, like all societies, it had its good and its bad sides.

In addition to roots in Greek culture, one should also recall that the Bible, specifically Leviticus 25:44-46 in the Torah, has God itself promoting slavery (New International translation):

Your male and female slaves are to come from the nations around you; from them you may buy slaves. You may also buy some of the temporary residents living among you and members of their clans born in your country, and they will become your property. You can bequeath them to your children as inherited property and can make them slaves for life, but you must not rule over your fellow Israelites ruthlessly.

II

It is my understanding that the practice of slavery was more or less universally accepted until recently. In his monumental study *Slavery and Social Death*, Orlando Patterson argues that slavery is part of a continuum of social institutions into which those who lose their social support network fall. Frequently they were captives in war, members of another tribe or individuals who are ostracized for some reason. What they have in common is that they lose all their rights and are not even seen as fellow human beings. But it is very important to realize that in many cases there is no connection of slavery to racism or to a belief in the inferiority of slaves. It is startling that in the dialog *Meno*, Socrates teaches Meno's slave boy that the diagonal of a unit square has length square root of two. Clearly, the boy's being a slave was not expected to have any correlation with his intelligence.

The terrible antagonism today between many police and black communities seems to be a perfect example of Patterson's phrase "social death". The placards shouting "I am a Man" show how emancipation from slavery did not release Afro-Americans from a state in which their lives had no value to the white community. The video of George Floyd's murder made it impossible not to recognize that in the eyes of the cop, Derek Chauvin, he was an outcast to which he could do anything he pleased.

A resounding repudiation not only of slavery but of all forms of social death is contained in the 1948 *Universal Declaration of Human Rights* passed unanimously by the UN General Assembly (with notable abstentions from the Soviet bloc, South Africa and Saudi Arabia). Although this formulation is so recent, its roots go back to the concept of "natural rights" in common law and to the writings of John Locke in the late 17th century. But accepting rights and equality *for every race, creed and color* has been extremely contentious. A landmark was the inclusion in the Declaration of Independence of Thomas Jefferson's ringing phrase "all men are created equal". But, as is well known, Jefferson himself appears to have lived with a deep contradiction in his attitude to slaves, not able to ever divorce himself from the institution while being deeply attached to his slave Ms. Hemings. I personally have known several highly educated people who doubted its truth.

What has two sides and is oversimplified is not slavery vs. human rights. Human rights is seen by a large percentage of the world's population as morally right, while slavery and social death to people living alongside us is seen as morally wrong. The biggest problem is not even that it is given merely lip service by many. The worst problem is that it is still *flatly rejected in practice* by so many countries. India, for example, consigns nearly all its Dalits, the untouchables, to virtual slavery. Most Dalits inherit lifelong jobs such as manually cleaning latrines with no personal protective equipment (PPE) which often causes them to die from this job. The Indian rallying cry "Hindutva" has justified massacres of Muslims. China does the same with its non-Han Chinese minorities, trampling on Tibetan culture and "re-educating" Uighers from Xinjiang in virtual concentration camps. Israel does similar things to Palestinians. Nationalists in many parts of the world support governments with such policies, blaming, ostracizing and taking away their rights from minorities.

But the problem of over simplification arises also because many college students and left wing activists feel that violations of human rights are so bad that this issue overrides all else. Thus the University of California wants every brilliant young academician applying for a job to demonstrate that he/she has made substantial contributions to reduce racism. A Yale Professor and his Lecturer wife were forced out of Silliman College for saying the student, not the University, should decide what Halloween costume was racist. Students are not given "Huck Finn" to read because it uses the forbidden "n" word. They ask for "trigger warnings", "safe places" for the subject of discrimination instead of teaching how the world has nearly always been totally indifferent to suffering, that there is pain in virtually everyone's life. In their terminology, they *cancel* any person not seen as sufficiently dedicated to eliminating racism (e.g. the administrators of their college), publicly shaming and forcing them to apologize. Racism has become the only issue for many Millennials. Even as they ignore how deeply human it is to categorize some fellow humans as the "other", they are doing it themselves to those they believe are racists. They have become totally intolerant of those whom they see as lacking sufficient tolerance.

There is another way, the Quaker idea. Believing that violence begets

violence, they advocate direct personal interaction in a neutral context with those who seem racist or intolerant. Ideally this leads to seeing the humanity in "the other" and, one hopes, to actual friendships. I recently read the beautiful story "Apeirogon" based on the true friendship between an Israeli and a Palestinian both of whom lost a daughter to the conflict. The Quaker approach means working not just with the demonized minority but with the demonizers. Eliminating racism requires engaging the "hearts and minds" of those practicing it, not shaming those less involved than themselves. The full picture is that acceptance of universal human rights is a huge challenge, one which is as much personal as it is institutional. All too many activists simplify the challenge which, if it ever succeeds, will require a veritable earthquake in human cultures.

III

Eugenics is another matter altogether, sharpening the question of whether, in fact, all men are equal. In *The Republic*, in the midst of all sorts of screw ball ideas about how a utopian society should be structured, selective breeding stands out as one for which a strong argument is made. Already by that point in time, selective breeding had produced superior domestic animals and superior grains. Everyone at the gathering where Socrates is propounding his utopian vision agrees that the same approach ought to produce superior human beings.

Socrates: Do you breed (your own dogs and cocks) from all alike, or are you eager to breed from the best as much as possible?

Glaucon: From the best ... from those in their prime.

Socrates: And what do you think about horses and the other animals? Is it in any way different?

Glaucon: That would be strange,

Socrates: My dear comrade, ... (is it not) also the same with the human species?

This would seem to be a strong argument. In a caste ridden culture like that of Victorian England, it was especially convincing. Thus the polymath Galton and his statistician followers Pearson and Fisher embraced and developed the idea. I submit that it is such a natural idea

that, were it not for the incredibly evil way Hitler embraced and terribly carried out his warped idea of the concept, it would not have been rejected as violently as most do today. I recently learned that Gonville and Caius College at Cambridge University has been trying to erase their link to Sir Roland Fisher, the father of much of modern statistics. But how has Plato and Galton's argument fared scientifically? Whether it is nonsense, as some would have it, or whether it is an evil idea, as most believe, are *two separate questions*.

Scientifically, the core of the problem is "nature vs. nurture", what human qualities stem from your genes and what from your upbringing? The problem with this endless debate is lack of data. Essentially the only hard data comes from the analysis of a microscopically small set of cases of identical twins that were separated at birth and brought up in different households. To get a larger database, some psychologists have had the idea that analyzing siblings would reveal how much their common genes affected adult traits. This ignores the obvious fact that sibling rivalry drives most siblings to develop in totally different directions. Another fragment of data comes from comparing the actual DNA sequences between people: it's astonishing that the differences amount to merely 0.1% different base pairs out of the roughly 3 billion base pairs in the human genome. Many people welcomed this as putting to rest the issue of whether some races were better than others. But are 3 million differences a lot or a little? They may be wrong. We know absolutely nothing about what in the genome correlates to desirable qualities such as intelligence, strength, love or empathy. And wait a minute: dogs have indeed been bred for skills liking herding sheep or for love, as in lapdogs. The success of such selective breeding certainly shows that genes do have considerable control on intelligence, strength, love or empathy. Moreover, Darwinian selection has been able to finely tune each species' strength, intelligence and social behavior for optimal performance in their evolutionary niche. It seems pretty clear that there must be key genes with powerful effects on the essential characteristics of its phenotype, the mature living form it codes for. We just don't know yet how this works. We don't even know what genes say mammals should have 4 limbs, not 6 as in arthropods, 5 as in echinoderms or 8 as octopods. In short, it looks as though certain genes might indeed affect major characteristics of human beings but how is not a settled scientific question.

IV

The scientific world is, however, working as hard as it can to open this Pandora's box. The invention of CRISPR editing of genes has staggering implications. Hundreds of labs around the world are developing this tool. No one questions that repairing defective base pairs responsible some diseases is a laudable objective that raises no big ethical concerns. But this is only a tiny step to the long range challenge of working out what genes are expressed in what cells, and how the genes manage to coordinate groups of cells to form organs, tissues and nerve networks and, ultimately, the characteristics of the adult organism. But I submit that you have to be blind not to think that science will work all this out in the next 50 or 100 years. The ethical problem is that this will reawaken eugenics. It will replace natural selection and selective breeding by artificial selection using CRISPR-like tools to modify human embryonic genes. It could, for example, lead to the human species itself splitting up, i.e. dividing into inbred races that are substantially different from each other in longevity, strength, intelligence, etc. This is an obvious possibility. Recall J. Robert Oppenheimer's words:

When you see something that is technically sweet, you go ahead and do it and you argue about what to do about it only after you have had your technical success. That is the way it was with the atomic bomb.

Editing embryonic genes seems to me to fall precisely into this category. All the brouhaha these days over GMO foods is only a minor dress rehearsal for the conflicts that such editing will cause. I have written a bit about this in a previous post, "Letter to my Grandchildren" but this feels so important to me that I need to reiterate it. Eugenics is most likely here to stay and is not something on which there are any easy ethical answers. Ethics and science are a bit like oil and water -- hard to mix. Facing the possibility of eugenics is going to be really hard: it needs both humility and an informed rational analysis that avoids over simplification.

This post has been translated twice, first into Spanish by Laura Mancini: [CLICK HERE](#). Thank you Laura. And then by Elana Pavlet,

into Hungarian: [CLICK HERE](#). Thank you Elana.

And now by Chema Bescos into Catalan: [CLICK HERE](#). Thank you Chema.

David Mumford's content on this site is available under a [Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License](#). [Click here for sitemap](#)
