

### Genetocracy: Rule by the Genetically Modified

Many Americans today think twice before biting into an ear of genetically modified corn. Will the Americans of the fifth or sixth decade of the 21<sup>st</sup> Century be willing to call a GMO their commander-in-chief? The CRISPR-Cas9 genome editing system has made the headlines several times in the past months and years in numerous scientific journals and several less esoteric publications. The technology can be used to modify the genetic code of human embryos with great precision. In 2015, the journal *Nature* credited researchers lead by Junjiu Huang of the Sun Yat-sen University in China of being the first to have applied CRISPR to human embryos. Humans have been the first and only animals to do many things – reach the moon, harness nuclear energy and a laundry list of other mind-melting feats, and so, the fact that humans have managed to edit their genomes seems to be just one more of science’s many achievements. However, CRISPR is fundamentally unique among humankind’s panoply of technological trophies. While it was undoubtedly humans that used Galileo’s telescope to peer into the heavens and used nuclear technology to cause the ruination of cities, CRISPR will allow humans to change what it means to be human. That humans can edit their genome is analogous to a software program that can tweak its own source code. Such an achievement is without precedent, and the outcomes of its use will only become clear with time.

Michael Bess, the author of *Our Grandchildren Redesigned: Life in the Bioengineered Society of the Near Future* discussed the implications of genome editing on the politics, ethics and daily life of people in the not-too-distant future at Purdue University’s Dawn or Doom ‘17 Conference. His insight regarding the consequences of using CRISPR is related to the cost of using it. The high monetary cost of using CRISPR to edit the genome of one’s offspring will be enough to restrict genome editing to the rich and powerful. With advances in CRISPR technology and with greater knowledge of gene expression, it will be possible to eliminate congenital diseases and reduce the risk of certain cancers.

Is it not every parent’s duty to do what’s best for his or her children? With this very same technology, it will become progressively easy to give one’s children positive traits – intelligence, disease resistance, attractiveness and perhaps even a sunny disposition. In this way, the world may see a new elite class – one that is not only richer and more powerful, but also kinder, smarter, and perhaps, happier. This too has no precedent in human history – great lords and monarchs of centuries past often ruled by the virtue of their *royal blood*, but this was nothing more than a fantasy, no matter how fervently believed the farce was. The elites of the future, however, may truly be genetically superior to the unmodified masses. Dr. Bess points out that there will be an emotional divide between this “superhuman” class and the unmodified commoners. The emotions aroused in an unaltered human need not be shared by the “superhumans”. It is possible that the two human factions have overlapping, yet distinct emotional spectra. Dr. Yuval Noah Harari, in his book *Homo Deus*, puts forth another startling idea: the genetically modified elite will have a genetic difference not only with the contemporary masses but also with all humans that have ever lived. The art and stories of the past are accessible to us because we may assume that the humans of the past had the same range of human emotion, seeing that they were not genetically different from us. That is, we may understand the sorrow Marc Anthony must have felt upon the loss of his friend in Shakespeare’s *Julius Caesar*, just as we may understand the elation Tom Sawyer must have felt when he emerged from the mining tunnels with Becky after being trapped there in the darkness in Mark Twain’s *Tom Sawyer*. The superhumans may not be able to experience these emotions in the same way, moreover, they may have emotions that are perhaps richer and more complex than what the masses can comprehend.

While emotional differences are hard to quantify, other aspects of genetic modification are more observable – strength and physical fitness will surely be one of the prime motivations to genetically modify one's children. It may be necessary to have two separate Olympic games – one for the genetically modified and another for the unmodified, seeing that the genetically modified athletes will leave their unaltered competitors in the dust, literally! It is worth noting that the Olympics for the GMOs will soon devolve into a competition between teams of scientists as the effect of the modifications outstrip that of the athlete's talent. People will almost certainly try to imbue their offspring with good looks. If you thought Hollywood sets unrealistic beauty standards now, wait till they get hold of CRISPR!

While the formation of a genetically superior elite sounds scary, and not in the least because of the horrific events of the 20<sup>th</sup> century, it is not necessarily all bad. Since we humans are the ones designing the next generation of human elites, it may well be possible to give them a nice strong dose of compassion, empathy, and benevolence. It may turn out to be a nicer world to live in for the animals, plants, and humans – modified and unmodified – if the people in charge of policy are kinder and more intelligent. Genetic engineering may speed up scientific progress because the future scientists may be designed to have Einstein-level intellect and Feynman-level curiosity.

There is another concern regarding CRISPR and future gene editing systems. Nations may have no choice but to adopt them. The nation that first adopts CRISPR wholeheartedly as a mechanism to improve its workforce will find that they will have the best scientists, engineers, doctors, economists, laborers and of course, soldiers – all modified as embryos to have traits best suited to their profession. Take note that these citizens need not ever be forced into any profession. They will simply choose the profession that the genetic engineers have predisposed them to enjoy. Nations that fall behind in the genetics race – because of financial, ethical or theological reasons, will find that their workforce is woefully inadequate to compete with the “GMO-friendly” nations. Thus, every nation will find that its hand is forced – adopt CRISPR, or become obsolete. A new form of government will emerge: rule by the genetically modified – a Genetocracy.