**The Ethics of Genetic Engineering**

By Karina Toy

The finale of Dan Brown’s latest novel, *Inferno*, reveals that Bertrand Zobrist, the antagonist, has created a “sterility plague,” that for the past seven days has infected every person in the world. (Brown 438). This plague is meant to solve the issue of overpopulation by genetically altering human beings and rendering a random one third of the population infertile. The protagonist, Robert Langdon, sees this solution as “‘…genetic terrorism…..it’s changing who we are, who we’ve always been, at the most fundamental level’” (Brown 439). On the other side is the antagonist’s perspective, in which he “…dreamed of fixing the fatal flaw in human evolution….the fact that our species is simply too prolific…we can’t seem to control our own numbers” (Brown 439). This essay focuses on the ethics of genetic engineering by looking at both sides: from the perspective of changing humans’ at the most fundamental level, to the perspective of improving a species. It assumes that genetic engineering at the scope of this book is already scientifically possible and perfected, so any safety and health risks of the unknown are null. In addition, this work focuses solely on somatic genetic enhancement, which is genetic engineering of the body that aims to improve the functioning of the human individual, and avoids the topics of GMOs[[1]](#footnote-1) or cloning (Koepsell 5). It simply looks at whether genetically modifying humans is ethical from different standpoints in philosophy, religion, bioethics, and policy making.

**Philosophy**

In philosophy the main argument against genetic engineering is that it violates the inherent “dignity” of humans to alter their DNA under any circumstance (Rifkin). The “natural” state of humans, unaltered by mortal intervention, is inherently dignified. According to this train of thought, since genetic engineering fundamentally alters humans’ at the most basic level, it is not dignified, and therefore unethical.

Humans, however, naturally seek self-improvement. Technological advances are complementary to our natural desire to improve, as they allow us to overcome our innate shortcomings. In 2003, Bostrom (493-506) said that by pursuing genetic engineering, therapies and treatments are developed that allow people who lead lives of illness, degradation, or premature death to overcome their natural or accidental limitations. One could conclude that because humans are by nature creatures that seek perfection, these enhancements do not pose a threat to human dignity. Thus, somatic genetic engineering must be ethical.

In 2007, Koepsell (10) argued that humans are inherently dignified because of their enormous capacity for cognition, creativity, and growth used to reach emotional fulfillment. He says that humans are the only creatures (so far) capable of art, science, literature, architecture, and transforming their environment to accommodate physical limitations. Koepsell concludes that if somatic genetic engineering were unethical and forbidden, it would diminish human capacity to achieve their potential, which in itself is an insult to human dignity. So, according to Koepsell, somatic genetic engineering must be ethical.

In 2002, Rolston (5-10) believed that the dignity of an individual member of a species is tied to its current state of evolution. This means that as humans are already developing or have developed such technologies, it is therefore dignified and ethical.

As early as 1947 Mill argued that nature is indifferent to dignity. It is simply humans’ inalienable right to do whatever they want to themselves which gives that dignity. Because humans are different from creatures incapable of reasoning and intentional action, they are inherently dignified. Therefore, somatic genetic engineering is ethical simply because it exists as a product of human creativity.

It is important to note that any invention used to diminish critical human capacities, such as cognitive functioning, would be inherently unethical (Koepsell 11). For example, using genetic engineering to stop any human from reaching their potential or creating genetically engineered slaves would be unethical. For a historical example, the eugenics program enacted by the Nazi’s to rid the world of the Jews and Romas,[[2]](#footnote-2) has been deemed by the overwhelming majority of society as unethical. From these examples, it is apparent that there would need for certain legal parameters to establish when somatic genetic engineering can be utilized.

There are other questions, philosophical ones, raised by the potentials of somatic genetic engineering. Will genetic interventions in humans create physical or behavioral traits that may not be distinguishable from what is nowadays considered “human”? Wll these manipulations redefine what it means to be “normal”? (Glenn). A simple way of answering these questions is that genetic engineering is just another step in human evolution. Many of the traits and technologies of present life would have been considered alien and abnormal a few hundred years ago: such as, iPhones, contraception in pill form, or airplanes. However, if humans could adapt to those advances, then they can adapt to genetic engineering.

In conclusion, as long as a human agrees to genetic engineering, it is ethical. Humans are dignified creatures who follow their nature, and if their nature is telling them to achieve a better life through alterations at the most basic and fundamental level, then it should be allowed and ethical.

**Religion**

Depending on the religion, there are many different arguments for and against somatic genetic engineering. Many moral theories in religion are based on ancient texts, considered to be the word of God as understood by man, which not only depend on humans’ interpretations of these commands, but also do not explicitly speak to the modern issue of genetic engineering. Several religious leaders believe that genetic engineering is intrinsically immoral as life is sacred and should not be altered by humans. In 1966 Ramsey (168) objected because he assumes that the sacredness of life is based upon a creator whose will is violated by genetic engineering and that humans are misusing their own freewill by creating such techniques.

However, if one can assume that a creator’s will is expressed in every facet of its creation, then a creator’s will would be the same as humanity’s, which is to create technologies such as somatic genetic enhancement. Thus Koepsell (6) says that genetic engineering is an expression of the creator’s free will, and so it must be ethical.

If genetic manipulation is in fact against a creator’s will, this would also mean that other forms of choosing genes, like selective breeding, are against a creator’s will and thus unethical (Koepsell 6). Selective breeding has been used for centuries by human societies to domesticate their animals and livestock. If, at its inception, selective breeding was declared unethical and against a creator’s will, then human evolution would not be where it is today. Thus, as genetic manipulation can be seen as just a more extreme facet of selective breeding, it must be considered ethical in order to account for where human evolution is today.

Most Christians are wary of somatic genetic enhancement because it alters God’s sacred creation (Epstein). However, Ted Peters, a liberal Protestant professor at the Pacific Lutheran Theological Seminary says:

…virtually all Roman Catholics and Protestants who take up the challenge of the new genetic knowledge seem to agree on a handful of theological axioms. First, they affirm that God is the creator of the world, and further that God's creative work is ongoing. Second, the human race is created in God's image. In this context, the divine image in humanity is tied to creativity. God creates, so do we. With surprising frequency, we humans are described by theologians as 'co-creators with God,' making our contribution to the evolutionary process. (Ethical and Spiritual Issues in Genetic Engineering)

Peters claims that since God is the creator of the world and humans were created in his image, humans are also creators. As such, it is acceptable for humans to create and use techniques like somatic genetic engineering.

In addition, Christian Scientists from the Chicago Center for Religious Science ask;

Why is it any more plausible to imagine God erecting electric fences around certain areas of knowledge than to imagine God watching with delight and parental pride as human beings use their divinely designed brains to decipher the code of life?....If we believe in the only kind of creator God compatible with evolution, we must also accept the divine way of improving all life forms through the divine experiments of natural selection, which at some point begins to include the human ability to become an active part of the process….God is urging us to become active agents of creation and evolution, correcting His mistakes as we grow in our understanding of His creation. (Ethical and Spiritual Issues in Genetic Engineering)

These Christian Scientists believe that God, as the creator of humans, would be proud to see His children succeed and improve upon His original creation.

In contrast, the Buddhists believe in ahimsa, "non-harming," respect for the intrinsic value of all sentient beings, not just human life. This leads to selfless compassion as a guiding principle in human actions (Epstein). In genetic engineering, this would exclude any use of a human, or “nonhuman” as an instrument or a means to an end.

For the Buddhist, another belief is that the potential for transcendence resides in all sentient beings. All sentient beings have the potential to develop spiritual wisdom and liberation (Epstein). Consequently, there is no need for genetic engineering as everyone has the potential to reach enlightenment.

In summary, the majority of Christians are wary of genetic engineering because it is altering God’s creation. However, Liberal Protestants view genetic engineering as ethical because humans are creators, created in God’s image, and genetic engineering is a technology that humans have created. Christian Scientists also believe that genetic engineering is ethical because God would be happy to see his children invent and improve themselves. In contrast, Buddhists believe that genetic engineering is unnecessary because humans already have the potential to reach perfection on their own.

**Bioethics**

In the world today there are more than six thousand known genetic disorders through inheriting an altered gene (Genetic Disorders-Better Health Channel). Innate traits used to be unpredictable and the result of chance and evolution, but with genetic engineering everything about a person might be controlled and changed. Through genetic engineering, a great many, if not all, of these disorders could potentially be cured forever. However, this science can also be used for evil, as in holding a person back from their potential through genetic alterations to make them less capable. So, where is one to draw the line in terms of ethics?

Using genetic engineering to turn humans into slaves by altering their genetic code is, for most people, unethical. However, consider the following: what if these humans are criminals, or mass murderers? Is creating slaves still unethical? Or, instead of the death penalty, which has no benefit to the rest of humankind except the loss of a terrible person, maybe it would be more useful to make them less capable, and then let them live in service to society. Is this ethical? Or what about what Zobrist did: create a sterility plague that, in his opinion, helped humanity, but at the same time took away people’s right to choose what happens to their own body. Could this be considered ethical because it helps humanity? These sorts of topics introduce questions that blur the lines of what can be considered an easy answer.

In addition to saving thousands of lives, genetic engineering could also be used in unessential ways; making a child more intelligent, changing their looks. Is this also ethical? It is one thing to save a life; it is another to alter a person for nothing more than vanity or the desire to get ahead. However, since humanity allows operations like plastic surgery and access to better education for those born into wealth, then genetic engineering for such “cosmetic” or “unfair” things should also be ethical. Koepsell (18) states that self-improvement is permissible, even when it provides someone with a competitive advantage for themselves and their offspring. It is unacceptable to pass legislation that prohibits someone from going to law or medical school because they come from a wealthy family. If one can use money to obtain a superior education, they should also be allowed to use that money for obtaining a higher IQ for oneself and offspring. On such grounds, genetic engineering is ethical.

According to Epstein, a major danger of genetic engineering is that it can be used to serve international corporate profit, instead of for public good. Businesses would be able to exploit this technology and sell it to others who may not use genetic engineering in as honorable a way as those with ethical values. In order to solve this, certain government-enforced policies would have to be created. However, technology can always find its way into the wrong hands; an intrinsic risk to all developments in any technology with capabilities to harm people. So, this danger should not be taken into consideration when determining the ethicality of genetic engineering.

Koepsell (7) argues that technology alters human’s relationship to nature. By embracing technologies, such as clothing, agriculture, and weaponry, evolution has accelerated; enabling humans to venture outside of the savannah, live in a variety of climates, and defend themselves from inclement environments and dangerous predators. Antibiotics and contraceptives are a form of technology that has allowed humans to interfere with the natural order of life. Thus, if one was to argue that the role of medicine in evolution is ethical; genetic engineering should also be ethical.

At the end of the day, the question is: do the benefits of genetic engineering outweigh the costs? At the moment, there are already experiments underway to develop the potentials of genetic engineering. For example, mice that exhibit human diseases to be used as pharmaceutical test subjects, or sheep that are able to secrete medicine in their milk (Rebelo). These experiments just go to show how much potential there is in genetic engineering. By contrast, the risks of this science are no different than those that humans have not already accepted for lesser technologies. There are dangers inherent to every new technology developed. In this case, the potential benefits of genetic engineering significantly outweigh the costs.

**Policy Making**

Most everyone would agree that when, not if, such a technology is developed, there should be legal limits and an ethical line to what a company or person can do with genetic engineering without facing repercussions. In 2004, Gleen asked the following questions that are important for those who are developing these policies. What ethical, social, and legal controls or reviews should be placed on genetic engineering? What unintended personal, social, and cultural consequences could result? Who will have access to these technologies, and how will scarce resources be allocated?

Mwase (39-56) insists that immediate issues involving the impact of access and social stratification on the surest notions of justice should be worked out in public debates, and from the results of that debate, to legislation. Koepsell (18) argues that it is difficult to establish rational oversight and regulation in humans while respecting both their autonomy and the need to guard against social injustice. Genetic engineering could create scapegoats out of those who receive the treatment, and thus cause even more of a problem.

Alhoff (39-56) raises the concern that the inequality of access raises obvious social justice concerns where treatments or services that are medically necessary might not be available to everyone because of cost. It would be best if there was fair access to genetic engineering. However, Koepsell (16) believes that this would be extremely hard to control as releasing this technology will deliberately exacerbate great disparities of wealth, political power, and existing inequalities. It would also create a new level to the have versus have-not inequality, those who could afford this technology, and then pass on their perfected genetic code, versus those that cannot afford it. Genetic engineering gives tangible economic and social benefits to those who can afford it. Unfair competition from people whose parents can afford genetic engineering only serves to make the upper class richer and the lower class poorer. In addition, it makes it harder for the poor yet motivated people who want to move up in the world from an underprivileged position.

A great example of a world where genetic engineering and policy making went too far is a novel by Scott Westerfeld, *Uglies.* While a fantasy novel, *Uglies* is an example of what the human imagination, and humans themselves, are capable of. *Uglies*is set in a world where everyone is divided into classes by age; Littles are kids age 0-12 who are considered cute and innocent. Uglies are ages 12-16 and are considered as such because they are going through puberty; they live in Spartan-like conditions compared to the rest of society. At 16, all Uglies go through a massive operation that turns them into Pretties, a “perfect” human being in terms of health and beauty. The Pretties live a life of luxury and partying until they reach middle age, when they are supposed to become serious and chose a career. The whole plot of the novel is about humans revolting against this system, a system which inadvertently creates a higher social class for the Pretties versus all of the others.

**Conclusion**:

There are many ethical concerns about genetic engineering, such as: what impact will it have on society, should it be allowed, and will it exacerbate social classes? However, with all of these concerns, genetic engineering is still ethical. Yes, like Langdon says, it is changing who we are at the most fundamental level; however this is simply a step to bettering ourselves, which for thousands of years is evolution towards which humans strive. As Sienna Brooks says, “…genetic engineering is just another step in a long line of human advances…” (Brown 453). Genetic engineering allows humans, as Zobrist thinks, to fix the flaws of our species. It gives humans the ability to cure genetic disorders, physically perfect themselves, and in short, speed up the process of evolution. While there were many good arguments concluding that genetic engineering is unethical, the general consensus derived from this essay was that it is indeed ethical, although there do need to be legal limits. These barriers should not allow the misuse of this technology, but at the same time should allow for humans to use it in whatever superfluous or serious ways they want.

**Works Cited**

"Genetic Disorders." *Better Health Channel*. State Government of Victoria, 31 Oct. 2013. Web. 04 Nov. 2013.

Alhoff, Fritz. 2005. Germ-Line Genetic Enhancement and Rawlsian Primary Goods. *Kennedy Institute of Ethics Journal* 15:39-56.

Bostrom, Nick. 2003. Human Genetic Enhancements: A Transhumanist Perspective. *Journal of Value Inquiry* 37: 493-506

Brown, Dan. *Inferno*. New York: Doubleday, 2013. Print.

Epstein, Ron. "Ethical and Spiritual Issues in Genetic Engineering." *Ethical and Spiritual Issues in Genetic Engineering*. Ahimsa Voices: a Quarterly Journal for the Promotion of Universal Values, 17 Mar. 1998. Web. 16 Oct. 2013.

Glenn, Linda M. "Ethical Issues in Genetic Engineering and Transgenics." *Actionbioscience*. American Institute for Biological Sciences, 2004.Web. 16 Oct. 2013

Koepsell, David. *The Ethics of Genetic Engineering*. Diss. Center For Inquiry, 2007. Washington DC: n.p., 2007. Center for Inquiry.Web. 6 Oct. 2013

Mill, John Stuart. [1859] 1947.*On Liberty*. New York: Appleton-Century-Crofts.

Mwase, Isaac M.T. 2005. Genetic Enhancement and the Fate of the Worse Off*. Kennedy Institute of Ethics Journal* 15: 39–56.

Ramsey, Paul. 2006. Moral and Religious Implications of Genetic Control. *In Genetics and the Future of Man*, ed. John. D. Roslansky. Amsterdam: North Holland Publishing Company.

Rebelo, Paulo. 2004. GM Cow Milk Could Provide Treatment for Blood Disease.

Rifkin, Jeremy. 1991. *Biosphere Politics: A New Consciousness for a New Century*. New York: Crown Publishers.

Rolston III, Holmes. 2002. What Do We Mean by the Intrinsic Value and Integrity of Plants and Animals? *In Genetic Engineering and the Intrinsic Value and Integrity of Animals and Plants*, ed. D. Heaf and J.Wirtz, pp. 5–10. U.K.: Hafan.

1. Genetically Modified Organisms-crops that are stronger and more fertile, among other things, compared to normal. [↑](#footnote-ref-1)
2. Also known as the Gypsies [↑](#footnote-ref-2)