
GENETIC ENGINEERING

Reproductive Roulette with a House Advantage

JEFF ALLEN

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PROFESSOR CHARLIE CURRAN

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INTRODUCTION AND BACKGROUND

A disquieting era of genetic manipulation is coming, one that may revolutionize human capacities, and notions of health. If we treat moral scruples impatiently, as inherently retrograde in a scientifically advancing civilization, we will not be in moral trim when, soon, our very humanity depends on being trim.

- George F. Will

Genetic engineering, or the directed and intentional altering of DNA, has only recently become a viable technology. With this new capability comes grave new responsibilities which must be seriously examined and considered; there is surely no shortage of ethical issues to be discussed in this field.

One primary distinction made in the field is that of genetic therapy versus genetic enhancement. Therapy is loosely defined as the curing of a genetic disease or ailment (such as Cystic Fibrosis) which can be addressed at the DNA-level. Enhancement, conversely, is the proactive effort which attempts to add to or improve upon current genetic configurations -- hyperbolic examples would include the addition of extra limbs, super-human intelligence or infrared eye-sight, etc.

Unfortunately, the distinction between therapy and enhancement is far from clear-cut. Cultural biases very concretely affect a society's understanding of "ailment" and "disease" based on what, to them, is a genetic liability. In some cultures historically, skin color was a genetic liability which very specifically determined your opportunities in life. In many cultures, the possession of two X-chromosomes hampers women's ability to thrive in politics and business. Other "diseases" can rightfully be considered a biological hindrance, but the outcomes of which vary widely based on the society in which the individual is placed. For instance, myopia can be a

life-threatening illness in jungle societies, but can be remedied by a pair of glasses in the modern West. Thus, if any one society in history were able to dictate genetic treatments on the basis of their understandings of disease, that society would likely have stifled certain genetic variety which our society embraces and appreciates. Various systems have been proposed to provide a more concrete differentiation between treatment and enhancement [1], including specifically Christian ones [2].

An individual's stance on the ethical issues in this field often have two distinct facets: an understanding rooted in the science behind the issue, and a set of moral presuppositions or deductions which guide the moral stances the individual will take. As Christians, we have some common ground regarding the moral presuppositions (though there surely is a wide array of interpretations even within this one perspective), but there are two distinct groups within Christianity regarding the scientific understanding of the issue: evolutionists and non-evolutionists. Non-evolutionists are commonly found among the more conservative denominations and often advocate either Creationism (that God created the Earth in a literal seven days as described in Genesis) or some form of Intelligent Design (a more broad interpretation which claims to encompass any interpretation which assumes or sees evidence of some pre-existing form of intelligence guiding the creative order).

As a large group of Christians view this issue in light of a belief in evolution, this paper will first discuss the ethics from an evolutionary perspective (which will apply to both theistic and non-theistic evolutionists), and then focus more on the Christian implications of genetic engineering. Once this background has been built, I will argue for specific stances on some of these issues.

THE EVOLUTIONARY PERSPECTIVE

Most species do their own evolving, making it up as they go along, which is the way Nature intended. And this is all very natural and organic and in tune with mysterious cycles of the cosmos, which believes that there's nothing like millions of years of really frustrating trial and error to give a species moral fiber and, in some cases, backbone.

- Terry Pratchett

A belief in evolution -- the assumption that life, as it now exists, is not static but is a dynamic system, constantly changing and growing to better adapt to the current environment -- may influence a person's moral stances on the issue of genetic engineering. These concerns will exist within Christian evolutionist communities as well as non-Christian ones.

Many evolutionists tend to have a respect for and appreciation of the cosmic improbabilities associated with various adaptations. This appreciation will often cause them to be hesitant about artificially altering a genome which, at this point in time, is so poorly understood. Many believe that "any major man-made change in a natural system is likely to be detrimental to that system" [3]. Regarding gene therapy, there is a hesitation that we have an over-simplified understanding of our genome when we represent a phenotypic condition as the product of a single gene or mutation. We are continually discovering that many genes are pleiotropic (one gene may have many phenotypic effects) or epistatic (in which a network of interactions are necessary to produce a single phenotype), which makes genetic intervention much more risky. This issue gets magnified when we consider genetic enhancement, which often involves not just modifying or correcting previously-existing genes, but actually adding foreign genes to a genome. A common view regarding our potential for finding and integrating good genes into a genome is that "it is very hard to identify a bad gene. It is even harder to identify good ones" [4].

Some researchers worry that our genome is so fundamental to who we are that altering it in any way would violate our identity [5]. Obviously, these people would be against genetic therapy as well as enhancement. Paul Ramsey suggests that altering our genome too much may be "species suicide" and that we may replace humanity with some species mistakenly thought to be an improvement [6].

Also, there is great concern over what group or organization would control this technology. Even if we were to only allow genetic therapy, there must be some group which dictates what constitutes therapy or enhancement. There are many utopian (or dystopian, depending on your particular stance) views resulting from a single group that controls physical and possibly even behavioral characteristics of the population.

Finally, there is concern among evolutionists that we may "over-fit" our genome to our current environment. Because evolution is a chaotic process, there are many things in our genome which we view as unnecessary or useless which may have had some purpose in the past and could have a purpose again in the future. The danger of "tidying up" our DNA is that we may be sacrificing needed genetic modifications which are not yet understood. Obviously, there is a great deal of debate and contention from an evolutionary perspective regarding genetic engineering.

THE THEISTIC PERSPECTIVE

*So God created man in his own image,
in the image of God he created him;
male and female he created them.*

- Genesis 1:27(ESV)

Having just discussed the sway biological influences have on an individual's ethical stance, we now move on to a theistic (specifically Christian) understanding of the issues. Many Christians believe that Genesis 1 and 2 (whether or not they are to be taken entirely literally) provide some insight into our fundamental nature. Genesis 1:27, in which it is stated that God "created man in his own image," has particular sway on our understanding of our position in creation [7]. With these things in mind, there are various ethical concerns within this perspective.

First, most would agree that there is some line at which point our technological abilities go beyond God's will for what we should do with our technology. Up to that line, we can and should invent and heal using our technology. Beyond that line, we have stepped into the territory of "God-like," not "God-imagers." This line is determined on an individual level, but it will be discussed further in the next section.

There is also some understanding of our responsibilities versus God's responsibilities. On one end of this debate are ethicists like Joseph Fletcher who emphasizes "the death of the old God" and argues that "there are no 'acts of God' anymore" [8]. On the other end of this spectrum are Christian Scientists, who urge the primary, if not exclusive use, of Spiritual healing as opposed to medical practices.

MY VIEW

But he said to me, "My Grace is sufficient for you, for my power is made perfect in weakness." Therefore I will boast all the more gladly of my weaknesses, so that the power of Christ may rest upon me. For the sake of Christ, then, I am content with weaknesses, insults, hardships, persecutions, and calamities. For when I am weak, then I am strong.

- 2 Corinthians 12:9-10 (ESV)

Healing has traditionally been viewed as a ministry of the Church [9]. I would contend that it is a very important part of the church and a ministry which should be continued; the church should not, under ordinary circumstances, limit healing as healing "goes with the grain of the ultimate healing of creation promised by God in and through Christ" [10]. I find my conclusions to be similar to those of Paul Ramsey, though my methods also resemble those of some Evangelical Conservatives.

All medical practices have some ethical component as they require resources to research and practice -- resources which could be spent elsewhere. We must analyze whether or not some proposed genetic treatment is a wise use of resources which could be diverted to studying other diseases or methods of healing¹. Friedman and Roblin provide a strong framework in which such decisions can be evaluated [11]. They list the following criteria to help measure the ethics of using a genetic engineering treatment: 1. we have an adequate genetic understanding of the patient's disorder; 2. we have prior experience with untreated cases of the same genetic defect so that the consequences of not treating can safely be assumed; 3. there must be adequate study of the quality of the DNA vector to be integrated into the patient's DNA; 4. there must be extensive

¹ Messer offers four criteria to be used in measuring the validity of a medical endeavor including the internal spirit of the investigator, and the applicability of this study to the poor. 10. Messer, N., *Selfish Genes and Christian Ethics*. *Ars Disputandi*, 2009. **9**: p. 1566-5399.

animal studies to evaluate benefits and side effects; 5. if possible, the patient's cells should be treated in vitro first so they can be examined for any signs of malignancy. These five criteria seem to help curtail any gross abuses of genetic therapy and limit the scope in which they can responsibly be used (though these criteria are not drastically different from questions which could be asked of many other medical practices). Assuming the medical study can responsibly be investigated and applied, we move onto more specific concerns.

There is a fine distinction: we are God image-bearers, but not like God. It was confusion over this issue that is revealed in the Fall, when Eve attempted to become like God. Messer articulates the distinction well, explaining that an attempt to be like God forgets our finitude and assumes that humans can accomplish anything given enough time and effort, while bearing the image of God accepts our finitude, but honors God's command to go and make something of the world [10]. In this life, we are to create, restore, and heal in an attempt to witness what was lost in the Fall, but we stop short of *re-creating* or believing that we could do better than God. Regarding our responsibilities versus God's, I find myself somewhere in between Fletcher and Christian Scientists -- a position which states that we are to labor and do all that we, in good conscience, can do, but then rest in faith once that has been done.

Some practices in gene therapy involve the use of human embryos, thus, the morality of such practices would hinge on the individual's view of the moral status of the embryo. However, these practices are not inseparable from genetic engineering, as there may be other methods which accomplish the same ends which don't involve the use of embryos. I consider this debate outside of the scope of this paper, so we will assume that genetic engineering, by definition, does not require the use of human embryos.

I argue that gene therapy differs from traditional therapy only by mechanism. As Christians, we are to find our identity in Christ, not in our biological make-up or DNA so we have no reason to fear genetic repair. I see no ethical issue with gene therapy, as an attempt to restore expected or common biological functioning in a person (though this is an admittedly fuzzy line).

Genetic enhancement, however, is morally problematic in my mind. Unfortunately, because of the ambiguity involved in even deciphering the distinction between therapy and enhancement, it quickly becomes difficult to articulate any less ambiguous arguments against genetic enhancement; many of these arguments have to do less with the teleological outcome of some action and more to do with the attitude or mentality of the actor (a measure which, admittedly, is difficult to legislate). Paul asks: "Do you not know that your body is a temple of the Holy Spirit within you, whom you have from God?" (1 Corinthians 6:19). Clearly, Paul feels that our bodies -- considering only the medical advances present in the first century -- were valuable just as they were.

This respect for our bodies is what motivates my objection to the idea of genetic enhancement. Various authors have phrased it differently; Peterson writes of a "loyalty to our present form" which, I think, encapsulates the issue well [1]. Messer distinguishes therapy from enhancement by stating that genetic enhancement aims to make us a "different kind of creature," a goal which forsakes the value in our present form [10]. If we had the respect for our physical bodies Paul urged us to have, I feel that we would be less interested in efforts to create "enhancements." We must be sated in knowing that we are created in the image of God, seeking fulfillment not in some super-human physical prowess, but in Him alone. Christ will bring the

ultimate fulfillment and we are incapable of a complete restoration in this life. No amount of technology or initiative will be able to fully restore what sin has broken.

It must be realized that the rightful goal of gene therapy is to cure specific diseases and ailments, not rid the world of pain. Suffering surely plays an important role in a Biblical world-view. From Paul desiring to share in Christ's sufferings (Philippians 3:10) to James' description of the role of suffering for a Christian (James 1:12-15), the New Testament is riddled with undertones which ensure that times of trial and suffering will come to Christians. Thus, a healthy understanding of the Bible would advise against seeking to completely rid our lives of suffering and pain. True joy comes from living a life of obedience in faith, not from sheltering our bodies (or our genes) from any potential harm. Paul learns to embrace a "thorn" in his flesh after he begins to understand that Christ will use Paul's weakness to glorify Himself (2 Corinthians 12:9-10).

Messer points out that we are right to have a frustration with the finitude associated with our embodied existence [10], but that some of these constraints are functional and fundamental to who we are -- attributes such as mortality and fragility. The Bible states plainly that our lives are fleeting; attempts to "cure death," for instance, are certainly outside of the scope of the Biblical understanding of the process of life and death.

CONCLUSION

It is impossible in the modern world for a man of science to say with any honesty, "My business is to provide knowledge and what use is made of that knowledge is not my responsibility."

-Bertrand Russell

There have been many problems involved in the practice of gene therapy to date [5], however that does not necessarily indicate a problem with the science itself, merely with the way it has been used. Concern over embryonic utilization is also a concern over implementation and not one at the root of what genetic engineering truly entails. Assuming these issues (and others) of implementation can be dealt with satisfactorily, we should continue to develop genetic methods to restore what was broken in the Fall, but we must not instigate a Baconian project or a modern Tower of Babel. Humans are not the foundation for some man-made edifice but have value as an ends as we are in that we are created in the image of a loving God. If we lose sight of that, we risk becoming ones who would try to build a new species in our own place.

Peterson concludes the issue well: "An improved immune system that frees one from cancer or the common cold so that one can more comfortably play bridge or hit the slot machines misses the point. Freedom from disease and increase of capacity so that one can better worship, care, serve, discover, live, is the point" [1].

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