THE KANTIAN CATEGORICAL IMPERATIVE AND GENETIC ENGINEERING: AN OVERVIEW

Olalere Kunle

Ayo Fatoki

Abstract

The emergence of genetic engineering as a mainstay in the medical sciences has encountered different reactions from both antagonists and protagonists with each group advancing reasons why its opinion should supersede that of the opposing group. The dichotomy mentioned above resulted from the fact that genetic engineering has often been exploited in ways that has aroused strong condemnations and has consequently put protagonists of genetic engineering on the back foot at most discourses on genetic engineering because of the lack of adequate censure on its use. This paper has identified the above mentioned and would propose the "Categorical Imperative" of Immanuel Kant as a form of control on the misuse of genetic engineering in the search for the better life. It would attempt the task at hand by showing that genetic engineering is value-free like all other technological innovations and that it becomes adoptable or condemnable based on the use to which it has been put by scientist and those who seek their expertise. The paper would examine some of the ethical issues arising from genetic engineering and project how its practice can thrive with little or no moral implications.

Keywords: Genetic Engineering, Categorical Imperative, Germline therapy, Somatic therapy, Universal Law.

INTRODUCTION

The advancement of medical sciences in the 21st century cannot be said to be totally without apprehensions spread across different divides of life. Questions bordering on the need to tread cautiously in the medical sciences have been severally brought to the forefront times without number leading to questions being asked about the incursion of radical trends into areas of medical sciences that were hitherto considered sacred.

Pioneer researches in genetic engineering influenced by the discovery of the double-helix structure of the DNA by Watson and Crick in 1953 which started out as an attempt at finding a new vista in the search for curative therapies has been taken over by zealous scientists whose sole purpose is to accumulate wealth at any rate without recourse to the protection of the sanctity of human life. This situation as described above has led many critics of genetic engineering to overlook the positive aspect of this scientific breakthrough and base their arguments against this phenomenon, solely on the aspect that they have severally denounced as inimical to human existence. For them, genetic engineering will inevitably shift the focus from nature and natural trends since it affords us the opportunity to speed up and re-direct the course of evolution in accordance with our choices it will therefore create the urge to use the method for other needs asides curative purposes .They claim that although the initial purpose for genetic engineering is commendable, over-zealous scientist would eventually take over and create a situation whereby the enhancement of human abilities and creation of super human being s would take centre stage.

From the above, we begin to see that genetic engineering suggests the power to genetically engineer the world and make it suit our whims and caprices. It also

presupposes the fact that there exists as a matter of fact, the tendency for some scientist if not curbed, to use this form of technology for purposes other than those that will benefit the generality of the human race.

We intend therefore, to show that there are certain benefits that can be realised from the use of genetic engineering in clinical procedures as against the evident hazards that are associated with its introduction and also that we can successfully use our scientific knowledge and ingenuity on humans and other life forms by creating a mid-point which would prevent throwing away the baby with the bath water in terms of condemning genetic engineering based on misgivings on the possibility of the activities of overzealous scientist. This we would do by proposing Immanuel Kant's notion of categorical Imperative.

What is Genetic Engineering?

Genetic engineering refers to the process of the modification of an organism's nucleic acid through recombinant DNA technology with the purpose of achieving an alteration of the genotype and subsequently, the phenotype of a recipient organism. This technology has also been defined as "the use of in-vitro techniques for deliberate manipulation of genes within or between species for the purpose of genetic analysis and product improvement and the production of manageable DNA fragments" [1] . According to Sybil Parker, it is the intentional production of new genes and alteration of genomes by the substitution or addition of new genetic materials" [2] .

The gene which is the basic unit of life is a nucleotide sequence that codes for a specific polupeptide, tRNA or rRNA. A nucleotide is made up of two parts including a carbonsugar and a Nitrogenous base. When these nucleosides are joined together by phosphate bonds they are referred to as nucleotides. The

bonding of these nucleosides to form a nucleotide is achieved when the Carbon on position 3 and the Carbon molecule on position 5 of an adjacent sugar molecule are joined together by a phosphate bond. DNA and RNA which are two types of nucleic acids are formed from chains of Polynucleotides. The 5 Carbon sugar present in DNA is called the deoxryibose. The sugar interacts with four different nitrogenous bases two of which are purine bases (adenine and guanine) while two are pyrimidine bases (cytosine andthymine).

It is important to mention that "since the discovery of genetic engineering it has been applied in the following areas

1. Studying the arrangement, expression and regulation of genes
2. Modification of genes to obtain a changed protein product
3. Modification of gene expression either to enhance or suppress a particular product
4. Making multiple copies of a nucleic acid segment artificially
5. Introduction of genes from one organism to another, thus creating a transgenic organism
6. Creation of organism with desirable or altered characteristic." [3]

From the above position as enumerated by Sridhar, it becomes clear that genetic engineering differs radically from every other known form of medical science in the sense that it gives the scientist unrestricted powers, that is, it presumes a wide range of possibilities when it comes to the modification of human genotype. It allows the scientist more than ample room to explore and exploit its offerings because of the numerous avenues to which genetic engineering can be channeled because it allows for the alteration of a person's genetic composition and thereby crate a totally different person from the one that hitherto existed.

However, a positive outlook outlines the fact that it would assist in no little way in the diagnosis and eventual eradication of certain diseases since "it holds the promise of curing genetic diseases and increasing human immunity to certain viruses. It is speculated that genetic engineering can also be used in changing a person's appearance, metabolism, and even improve mental faculties like memory and intelligence"[4].

VERSIONS OF GENETIC ENGINEERING

Somatic Therapy

This form of genetic engineering involves the injection of healthy genetic materials into patients with genetic diseases as a form of treatment. It is essentially for curative purposes and as such it is always employed to serve as a means of correcting certain genetic anomalies. Somatic therapy has helped medical sciences advance in so many ways so much so that diseases that were hitherto seen as incurable ,especially those that were attributed to defective genes are now being cured and the advancement of genetic engineering promises the possibility of breaking more grounds .

There are few, if any ethical issues arising from the use of somatic therapy because of the curative purpose which it serves. As a matter of fact, for the antagonists of genetic engineering there will be no problem arising from the use of genetic engineering if it remains at the stage of somatic therapy since it is solely for curative needs especially when there is an urgent global clamour for improvement in the health sector service delivery.

Germline Therapy

This differs totally from somatic therapy in its content and act since it involves the arrangement of a person's own replicating genetic material in such a way that he or she produces the healthy genes. The process described above has a permanent effect on the reproductive capacity of the organism in question. The risk involved in the use of germline therapy arises from the fact that the "reproductive genetic material" of the organism is permanently influenced in a way that has not been fully understood, even by researchers world over. The risk contained is two-fold, involving the patient on one hand and his or her offspring who are most likely expected to share in his genetic composition due to the genetic alteration of their forebear. An argument against germline therapy posits that we should as a matter of urgency take into consideration the effect that could follow the use of genetic engineering.

Ralph Epstein argued that we hold a 'fairness obligation' to the future generation by reducing "the level of risks to which future generations will be subjected to"[5] especially on the backdrop of the fact biotechnologists have not fully understood or mastered the science of genetic engineering.

The above mentioned position is further stressed by K Schroeder-Frechette when he said "until or unless a risk imposition receives the consent of those who are its potential victims, it cannot be justified"[6] . The Society, Religion and Technology Project, a part of the Church of Scotland affirms that genetic engineering crosses some forbidden lines since it affects patterns of relationship and of course entangles further the 'web of life' which we are as of the present time not able to fully comprehend.

By and large , the crux of germline therapy subsists in the fact that it takes the task of genetic engineering in medical sciences away from the traditional duty of 'fixing a broken part' into that of equipping an individual with the ability to reproduce offspring with replica genes introduced into the patient in question. It also suggest to us that "we may be rapidly acquiring the powers to modify and control the capacities and activities of men by direct intervention and manipulation of their bodies and minds" [7]

Another criticism worthy of note brought against this version of genetic engineering is that it brings a whole new definition to genetic engineering since it redefines the scope and meaning of what would pass as diseases in clinical procedures. It approves of the fact that we can use medical sciences to satisfy certain human cravings such as parents giving genetically modified or manufactured growth hormones to their normal children in order to produce better candidates for football or basketball.

In his analysis of germline therapy, Rob Epstein invites us to ponder on what it would look like in a future where life is started with parents designing human genes for their unborn children in addition to the fact that they have the power to direct and genetically engineer the world as it is now known. The problem is further captured in the fact that the future becomes subject to the whims and caprices of a select group of scientists and those who can afford to procure their services.

From the foregoing, it is important to state that the social obligations of researchers in areas of genetics is distinct from those responsibilities they share with all other citizens because they have access to specialised knowledge on how to totally

transform our world hence, they owe the entire world the duty of making public any social implication arising from their works.

ETHICAL ISSUES ARISING FROM THE USE OF GENETIC ENGINEERING

There are certain moral problems that would accompany the adoption of genetic engineering in clinical procedures due to some of the issues raised in the discussion of germline therapy and it is instructive to note that these moral problems are inseparable from genetic engineering as shown in the agitations of the critics of the activities of researchers in areas of biotechnology. Some of the moral problems will be outlined and discussed in a bid to show the need to adopt a corrective measure in curbing the misuse of genetic engineering. They are as follows

1. Abuse of Power

Man's ability to use his technological prowess in the betterment of his lot has woken us from our deep slumber to the full realisation of the fact that "our growing technology also possess growing moral challenges to the present and future generation that we no longer can consider technology solely as meant for the betterment of human life"[8], (Onwuegbusi) but also as a source of power which can easily intoxicate whoever wields it and most importantly, a tool that can be used to deprive fellow human persons of their rights and priveledges. For instance, critics have argued that the power bestowed on the scientist by this new discovery would allow him direct the course of human existence as he wills. He could decide to

'create' a breed of human beings that would possess extra-human abilities that would place them above other human beings.

In addition to this, genetic engineering has also been criticised that it will allow a certain group of people to dictate and control human achievements since it is a known fact that human abilities depends in part on his genetic composition and the "limits of his capacities and powers are indeed genetically determined"[9] Leon Kass

Mechanization of Life Process

The moral problem raised here is premised on the argument that genetic engineering would change all we have come to know as the norms and traditions associated with the sanctity of human life. It argues that genetic engineering would threaten the natural human reproduction process as we have come to know it, into mere production. It threatens to convert life and death into similar processes, depending largely on technical calculations.

Critics argue that it will erase things that were hitherto considered natural when scientists begin to grow human genes in the laboratories and consequently push the human race into an "unmapped ethical terrain"[10] . Talking of unmapped ethical terrain, critics posit their claims on the proposition that we would inevitably shift our focus from nature and natural trends, with the use of genetic engineering we will be able to speed up and re-direct the paths of evolution in line with our choices thereby neglecting what appears natural and moral for that which is mechanical and unethical against the will and directive of God. A major reflection of this problem can be seen in the use of genetic engineering for reproductive purposes.

As stated above, genetic engineering presupposes a mechanised process where everything is subjected to calculations such that our definition of what diseases and their cures are begins to change radically. We could begin to define being fat or unattractive as a disease and begin to make attempts at eliminating genes that are responsible for being fat or stocky through the use of the enhancement procedures of genetic engineering.

According to Hartwell in his critique of genetic engineering and the re-definition of what diseases are, he said "it may well be possible to choose to have babies with certain but not other physical or mental characteristics. This 'opportunity' when actualised would present a severe ethical problem because it carries the potential for being socially destructive. It seems likely that most potential parents would want highly intelligent, athletic, sturdy, well-built children- and one can go on naming characteristics we all admire and would want our children to have"[11]

The problems with the mechanisation of human life rests in the fact that it would disrupt the social structure and other social patterns since it would allow for the tampering of issues that are normally expected to take a natural course in human existence.

Distributive Justice

When genetic engineering is adopted in clinical procedures, who decide those who will and will not benefit from its offerings? How can it be arranged such that there will be not be a monopoly of the use of genetic engineering by a particular group of people to the detriment of others?

This question is aptly conceptualised in Kass' words where he argued thus

> The introduction of any biomedical technology presents a new instance of an old problem on how to distribute scarce resources justly. We should assume that demand will usually exceed supply. Who should get the benefits of gene therapy or brain stimulation [12]

What we are faced with in a situation of this nature becomes more lucid when we understand the fact that if genetic engineering becomes adopted there will of course be an upsurge in its demand thereby creating a problem where the services would be in shortage like most other clinical procedures that have been widely accepted in the present day medical practice. The critic of genetic engineering who has envisaged this ethical implication ahead of time would readily argue that it is better not to create an antidote, than to create one that cannot be readily accessible to all and sundry.

Another angle that has been over flogged is the right to allocate project funds on genetic engineering when other areas of medical science that are equally important to human existence are left unattended to. For Kass, the "current squeeze on money for research provides us with an opportunity to rethink our priorities" [13] whether what is most important is to meet the current needs of the world we live in which includes poverty, global warming, sectarian wars in different regions of the world, flooding and so on or the development of a form of technology that will be beneficial only to a group of people.

The 'Future Generation' Argument

Ethical issues brought to the fore here consists solely in the argument that the effects of whatever we do with genetic engineering especially germline therapy,

would be transmitted to generations yet unborn. Critics often point to the argument that we have no moral grounds to justify taking decisions that will affect the lives of our offspring especially when we cannot say that we have fully understood and mastered the workings of genetic engineering. The consideration of the long-range effects or implication appears valid at least to the extent which common sense can immediately take us.

Another position states which advocates inter-generational ethics state that the present generation holds a responsibility or duty of leaving the world a better place than we met it. It is a rallying point for critics of germline therapy. The argument as put forward above shows that germline therapy in particular can be a vehicle through which the transmission of inheritable diseases can be carried out unwittingly. A proper articulation of this position seeks to assert whether we have an ethical duty to improve on the present generation to ensure better genotypes in the future.

The lesson to be learnt from the above is however situated in the fact that since we cannot readily know the outcome of these experimentations, it is morally wrong to consent to its continuous use since we do not have a means of measuring its effect on the future generation.

For Marc Lappe a champion of the future generation argument, it is actually a moral dilemma for parents to approve the experimentation for future benefits. He argued that "these problems underscore a second limitation posed by inter generational ethics to germline therapy. When we are ignorant about direct or second order consequences of an intervention, particularly when these consequences may be harmful and irreversible, we are obliged to exercise responsible restraints in developing and implementing that technology"[14]

Commercialisation

At the rate at which genetic engineering is being touted it will be on offer for those who can afford to pay exorbitantly for it and therefore becomes accessible only to those who can afford it and by implication only wealthy parents will opt to design their children with genetic advantages because they can afford it and mostly because they want to provide their newborn child with the best opportunities in life thereby giving them an undeserved advantage above their peers. This position points to the fact that children of parents that cannot afford genetic engineering are introduced into the world disadvantaged from their first breath.

Silver a critic of genetic engineering, invites us to further ponder on a situation where "the children of the higher socio-economic classes not only have the social advantages they now possess, but in addition to that they also have certification that their intelligence, memory, immune system and capacity to concentrate attention on tasks for longer periods have all been upgraded through the use of genetic engineering"[15] .

THE CATEGORICAL IMPERATIVE

Immanuel Kant was a German philosopher who lived from 1724 to 1804. He made important contributions to all the major fields of philosophy but we will be considering his ethical theory in an attempt to modify genetic engineering especially on the basis that his moral theory advocates that "moral requirements are requirements of reason and to act immorally is to act in a way that is irrational"[16] Timmons P151. The categorical imperative which captures Kant's view on ethics or moral philosophy suggests that all our actions should be products of a rigorous thought process seeking to affirm if those actions can be made

universal laws without any unforetold consequences. The guiding idea contained in the categorical imperative is the requirement to treat oneself and others in a way that protects and promotes one's humanity and the humanity of others.

Kant posits that "if moral requirements are unconditionally valid for all rational agents, then there must be requirements that are categorical"[17], that is, if we as moral agents are expected at all time to live moral lives by choosing moral and good actions over immoral actions then there must be a standard or indicator by which those actions are categorized or defined. For him that standard is the Categorical Imperative or the universal law which simply dictates that an action can only be termed as moral when it can be generally allowed for all moral agents without any dire consequences. The standard is further made lucid thus

> There is therefore but one categorical imperative
> namely this, act on that maxim whereby thou canst
> at the same time will that it should become a universal
> law[18]

He argued that we should do things because they are right and not because it promotes our desire or self-interest. He also avers that "we know what is right not by relying on moral intuitions or facts about the world, but by reasoning about what we can consistently will. To test a moral maxim, we ask ourselves whether we can consistently will that everyone follow it (and thus act that way towards us) we must reject the maxim if we cannot will this" [19]

From the above we will find out that Kant advocates that the only condition by which genetic engineering can become acceptable isS that we should set certain paradigms and make them universal maxims from which all and sundry can

benefit. If this position is adopted genetic engineering will become guided with a view of ascertaining that duties which have been prescribed are not violated. The application of categorical imperative will also allow us to put these into consideration when discourses on biotechnology and its uses come to the fore and assert for instance that the use of certain hormones for enhancement of human abilities cannot be universalised. If we accede to Kant's propositions we would do well to discourage its use to serve such ends and concentrate solely on the aspect that have been identified to be essential for curative purposes.

Having said these, it is suffice to say that the Kantian Categorical Imperative is a sufficient basis on which the control of genetic engineering can be situated, that is, the conditions given by Immanuel Kant as essential in the performance and judgments of every moral duty is a very good medium by which the activities of rogues and over-zealous scientists can be curbed such that when the technology is fully brought into clinical procedures a limit will be placed on how and when it can be applied in the treatment of any disease or ailment.

Consequently, it is important to quickly reiterate that, genetic engineering at glance cannot be classified as a risky or beneficial technology. It is the activities of those who will employ or explore its offerings that would largely determine its colouration depending on the purpose to which it has been put, therefore in anticipation of the above mentioned we should allow for the use of the universal law of Categorical Imperative as a 'safety catch' or preventive measure in our bids to rid genetic engineering of undue application which could spell doom for the entire human race.

REFERENCES

1. R. Reiger, A.Michealis and M.M Green, Glossary of Genetics : Classical and Molecular (New York:Springer-Verlag,1991) P.210
2. Sybil Parker, Mc Graw Hill Dictionary of Scientific and Technical Terms 4th Edition (Ohio: Indicide Press, 1969) P.796
3. R.P.N Sridhar, Genetic Engineering/ Recombinant DNA Technology www.microrao.com 2006
4. Peter Singer, Analogy of Bioethics (New York: Weasel Publishers,2000) P. 15
5. D. Brock, 'Genetic Engineering' in R.G Frey and C.H Wellman, A Companion to Applied Ethics (New York: Blackwell Publishing, 2007) P.76
6. Ibid.
7. Jeffrey Klugger, Can We Stay Young, Time Magazine, No 64, 3 July,1996 P.32
8. M.O Onwugbuesi , 'Technology and Morality' in Ayo Fadahunsi (ed) Philosophy, Science and Technology (Ibadan: Hope Publications,2003) P.49
9. Leon Kass, New Biology: What Price Relieving Man's Estate (New York: Raven,1971) P.168
10. Roger Shinn, Family Relationships and Social Policy: A Ethical Inquiry In The Genetic Frontier (Washington: American Association for the Advancement of Science,2008) p.23
11. L.H Hartwell, Genetics : From Gene to Genome (Boston: Mc Graw Hill,2000) P.45
12. Op. Cit., P.73
13. Ibid.

14. Marc Lappe, Ethical Issues in manipulating Human Germline in Bioethics: An Anthology, H. Kushe and P. Singer (ed) (Oxford: Blackwell Publishing,2000) P.69
15. James Marcum, Humanising Modern Medicine: An Introduction to Philosophy Of Medicine (Texas: Springer Publication,2008) P.113
16. Marc Timmons, Moral Theory: An Introduction (Oxford: Rowman and Littlefield Publishers,2002) P.56
17. Ibid. P.156
18. Immanuel Kant, Groundwork of the Metaphysics of Morals (Cambridge: Cambridge,1997) P. 23
19. Op. Cit. 157