UNIVERSITY OF NAIROBI

DEPARTMENT OF PHILOSOPHY

RESEARCH PROJECT REPORT

THE MORAL FOUNDATION OF GERM CELL GENETIC ENGINEERING

BY:

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A PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF ARTS DEGREE IN PHILOSOPHY OF THE UNIVERSITY OF NAIROBI.

DATE: JULY 2001

DECLARATION

This project report is my original work and has not been presented for any award in any other University.

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This project report has been submitted for examination with our approval as University supervisors.

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ACKNOWLEDGEMENTS

The successful completion of this work was only possible through the assistance from various individuals and institutions.

In no any other decent way other than by acknowledging in this page, I express my heartfelt gratitude to the following for their precious, invaluable and timely assistance.

I gratefully acknowledge my indebtedness to the benevolence of the University of Nairobi for offering me the prestigious postgraduate scholarship.

I am greatly indebted to the tireless efforts of my supervisors Dr. Solomon Monyenye and Mr. Patrick Ouma Nyabul whose advice, guidance and valuable suggestions greatly assisted in making this project report what it is. Also I acknowledge Dr Jack Odhiambo's assistance, which transformed a remote idea into a feasible work.

I am indebted to the entire department of Philosophy academic and support staff members for their encouragement and selfless manner in which they availed themselves whenever need arose, and availing of the resources without which my studies would have been in great jeopardy. They constantly drew my attention to philosophical issues I would not have noticed on my own.

I acknowledge my indebtedness particularly to Fr. Dr. Joseph Kariuki and the entire department of Philosophy, Kenyatta University, where I was for one year, for the unrelenting and unrivalled assistance that they always willingly availed to me. Even after intermitting the studies the K.U fraternity never considered me an alien.

I am indebted to my classmates Justice P. K. Tunoi. M.P. Mwangi and J. Ouko with whom we philosophised together. With special respect, I am indebted to the assistance from all-the-time-down-to-earth Honourable, Justice Phillip Kiptoo Tunoi, the High Court of Kenya appellate judge who offered me express and unbound use of his immaculate office, a computer and a laptop just to be sure that I scored the best.

I wish to acknowledge my indebtedness to the diligent care and faithfulness with which Esther Kivuitu, Jane, Purity and Mary always punctually and without grudges tirelessly typed and retyped this report to perfection.

I acknowledge the morale and support I received from my all-season friends S.Ngari and J. T. Mbau with whom I shared 'marginal utilities', D. Gichuki, F. Richu,S. Mbugua,S. Mbuthia, J.Kamau, M. Kamau, F. Ruo,H. Bong'o, C. Soy and Sharon.

In an extra-ordinary way I am indebted to Jennifer Nyambura for her indefatigable love and for being a constant, dependable source of hope, challenge and inspiration.

The tangible and intangible support either in form or kind that I got from my entire family members particularly my loving Mum cannot pass unacknowledged. It was their prayers that I make it through in my studies.

DEDICATION

I dedicate this work to the victims and those who are under constant vicious threat of the debilitating and disabling effects of benign and malignant gene deformities.

ABSTRACT

This is a multidisciplinary study. It integrates medical ethics and the emerging biomedical technology of Recombinant DNA. The study sets out to investigate, and attempts at resolving, the controversy surrounding the ethical foundation of the biotechnology of germ cell genetic engineering. The contention in this study is that the persistence of the moral controversy is due to the lack of an appropriate ethical framework of analysis which is in tandem with the practice, and aims of the germ cell genetic engineering.

This study sets out to examine the ethically relevant grounds that can necessitate and justify the application of germ cell genetic engineering technology in the process of human reproduction.

The methodology adopted in this study is critical and analytical inquiry. Focusing on the secondary data obtained from the library research, a critical analysis and argumentation has been used in order to determine and evaluate the meaning, underlying assumptions, implications and justifications of the stand taken. The stand taken is that the ethical foundation of germ cell genetic engineering is that of quality-of-life ethic.

Setting the inquiry within the pragmatic consequentialist ethical approach, the argument advanced focuses on the goal of attaining happiness. This is possible when leading a quality life. In this respect germ cell genetic engineering with its immense benefits and assurance of quality life is viewed as morally necessary and justified. The findings of the study show that the moral value to be derived from the utility of genetic engineering outweighs the moral evils.

In paving the way for an ethical discussion, the study exposes the invalidity of the a priori and a posteriori objections leveled against germ cell genetic engineering. This is after analyzing them under a posteriori pragmatic ethical framework. The a priori objections are dismissed as morally insignificant as they are metaphysical and empirically indemonstrable. Whenever they are appealed to in ethics they kill the argument there and then. However, ethics is not absolutist. The a

posteriori objections are also dismissed as an informed public policy framework in a democratic and liberal society can adequately address them.

Principally the right to, and the obligation to ensure, a normal opportunity for health to every possible child is a utilitarian requirement of human obligation. This utilitarian obligation dictates to the current generation, as individuals who are morally responsible, to do that which is possible to ensure posterity's attainment of quality life. As such controversial issues like discarding the germ cells, aborting or refraining from procreation are morally praiseworthy.

The findings of this study exposes the opposition to the possibility of moral acceptance of germ cell genetic engineering in the human reproduction process is due to the unsuitability of the currently domineering ethical approach. This is attested to by the exposure of two dominant but radically opposed ethical frameworks that are usually called forth in the assessment of the morality of germ cell genetic engineering.

The sanctity of life is metaphysical, a priori, absolute and empirically indemonstrable in medical ethics. The quality of life concept is empirical, pragmatic, and based on differences of relativities of the person's quality of life. The quality of life supercedes the sanctity of life by its recognition of the varying worth of human life thus enabling the meritorious treatment of each clinical case. This is vital as it avoids the hypocrisy, contradictions, difficulties and absurdities that mark the sanctity of life ethical doctrine. The practice and the aims of germ cell genetic engineering are geared towards the attainment of quality of life. Therefore the quest for quality life emerges as a moral ground for defending germ cell genetic engineering.

The study recommends *inter alia* a change of ethical attitude to enable a wider acceptance of germ cell genetic engineering. It also recommends the enactment of guidelines and more societal participation to curb the misuse of germ cell genetic engineering technology.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Germ cell genetic engineering is a branch of the broader genetic engineering technology. It is a "by-product of the relatively new science of genetics" (McDonagh, 2000:8).

The science emerged out of the pioneering work of the Austrian monk, Gregory Mendel. After experimenting with green garden peas, he discovered and enunciated the hybridisation principles as explicated in his 1865 publication of his theory of "organic inheritance" (Burns, 1983; Ugincus, 1994; Rao, 1999; Edwards, 1996). Unfortunately his work remained unrecognised until early twentieth century. Twenty years later plant breeders were using his rudimentary principles of genetics to improve their crops.

In 1953, with the discovery of the physical make-up of D.N.A (deoxyribonucleic Acid), the base molecule of life by James Watson and Francis Crick, a new turn for genetics was heralded (Mc Donagh 2000). They discovered that the D.N.A structure was a double helix where two strands were twisted around each other like a spiral staircase with bars extending across each of the connecting strands (McDonagh, 2000; Burns, 1983; Tullar, 1977: Washborn, 1978: Rao, 1999). These units composed of four different chemical nucleotides namely deoxyadenylic acid, deoxyguanylic acid, thymidylic acid and deoxycytidylic acid (Burns 1983: 437, Rao 1999), arrange themselves in an "infinite variety of patterns" that form the gene (The Genome). It is the precise ordering of the chemical base in the DNA molecule, which makes each life form unique. In the light of Watson and Crick's discovery, biologists began to realize that by changing the ordering pattern of the genetic materials, they

could change or modify life forms. This heralded the birth of recombinant D.N.A technology the precursor to germ cell genetic engineering.

The practical utility of this discovery where a scientist can cut, delete and recombine genes was realized after the discovery of the "cutting tools" (McDonagh, 2000:8; Burns, 1983: 437). These are a group of highly specific "restriction endonucleases" enzymes that break internal bonds of the D.N.A to make double stranded breaks only within certain short sequences that show two-fold symmetry around a given point (Burns 1983;437).

In 1973 Stanley Cohen and Annie Chang inserted genes from a South African clawed toad in a bacterium *escheralia – coli* (Burns, 1983; McDonagh, 2000:9). When the *E-coli* reproduced themselves they also produced the toad gene that had been inserted into the bacteria. Many others using only plants and non-human animals followed this successful case of gene recombination.

For a long time, breeders restricting the use of genetic engineering technology to non-humans have been quite successful in improving for human benefit, the genetic endowments of domesticated animals, cultivated plants and micro organisms. This restriction of genetic engineering to only non-humans is cited as a form of specieism.

With the possibility of being applied to the human reproduction process, gene modification programme has become pre-eminently an issue in the 1990s (Pence 1995). This has been precipitated by the claims of evolutionary science that mankind arose from primitive forms of life. This is corroborated by the evidence that when genetically compared to some higher

animals man's genome differs in degree and not in kind (The Genome; Singer, 1994) This lack of a marked difference between human and non-humans has led to the idea that the breeding techniques used on plants and animals can also be used successfully to modify man's genetic material. This possibility has generated a lot of controversy. The proponents and the opponent of genetic engineering cite varied reasons to support their stand. There is no consensus on how the application of genetic engineering on man should be evaluated and this is evident from the persisting controversy resulting from the use of varied perspectives of evaluation.

1.2 Definition of terms

Germ Cell Genetic engineering-In this disquisition germ cell genetic engineering is the technical manipulations that involve the reproductive cells. When performed on sperms, ova or undifferentiated cells of an early embryo the consequences are not limited to the individual being but to the future generations as well and may become a permanent part of the gene pool (Pence, 1995). In other words, germ cell genetic engineering alters the hereditary materials that consequently the posterity inherits. Germ cell, germ line or genetic engineering will be used interchangeably.

Ethical foundation – In this study the term is taken to mean those principles, ideas, reasons or facts that justify the application of germ cell genetic engineering in the process of human reproduction

1.3 Statement of the problem

Broadly speaking, the moral controversy centres principally on two poles; that of sanctity of life and quality of life. The opponents of genetic engineering cite the sanctity of life as the moral ground for their opposition. They argue that the application will be pernicious and a

gross violation of the sanctity of human life. The proponents on the other hand cite the benefits of enhancing the quality of life by use of germ cell genetic engineering as their moral grounds for supporting the application. That is, they argue that the application will be beneficial to the quality of human life. Seen in this context, what if anything is the ethical foundation upon which to defend the morality of the application of germ cell genetic engineering in the process of human reproduction?

1.4 Objectives

This research is guided by the following objectives:

(i) To examine the scientific and moral utility of germ cell genetic engineering.

(ii) To investigate the claims of right to quality life by the future generations.

(iii) To critically examine the nature of the correlative obligations of the present generations in relation to germ cell genetic engineering.

(iv) To develop and defend a suitable ethical framework that can be used to defend the application of germ cell genetic engineering.

1.5 Justification and significance of the study

The dilemma of the suitable ethical foundation upon which to justify the application of genetic engineering touches on a very fundamental issue of life, that is, quality of life to which man has been using a variety of inefficient means to achieve. This study is necessary and justified as it seeks to investigate the appropriate moral foundation for justifying genetic engineering as an alternative means to achieve quality life.

The findings of the proposed study will form a core source of reference for students, policy makers and all those interested in the topic of genetic engineering. The study findings will clarify, enhance and foster a clear understanding of the application of genetic engineering as a means of controlling human reproduction process and eventually his evolution.

1.6 Literature Review

The morality of applying genetic engineering techniques to human reproduction process has been analysed using varying philosophical perspectives and frameworks leading to a multiplicity of most often contradictory solutions. This ensuing contradiction further entrenches the moral controversy of genetic engineering. The following is a critical presentation of such ideas.

Holmes (1984),Kass and Ramsey in Mappes(1981) and Feinberg and Feinberg (1993) proposes that before evaluating arguments for and against genetic engineering technology, it would help to state several distinctions and principles usable in the discussion. It is instructive to distinguish the technology itself from the motivation for and uses of it. Whatever one says ethically about this technology must be argued directly or indirectly from explicit or implicit moral principles supportable by reasons. Some motivations behind getting technology and some uses of it are morally wrong, but that does not make the technique immoral, nor does it make all motives and use of it immoral. They appear to be proposing that any convincing argument for or against genetic engineering technology should be supportable by concrete facts and more so with a great adherence to logical consistency.

The lack of clarity of what some concepts mean when used in the context of genetic engineering technology is argued to be a threat to man. We are informed as this technology relates especially to human beings, one must "distinguish eugenic and therapeutic uses" (Pence 1996) as there is usually no clear cut line between a genuine disorder and what is merely a preferred trait. The best way to distinguish "disorder" and diseases is only by focusing on their capacity to impair any one's ability to function. (Feinberg and Feinberg; 1993; Mappes and Degrazier; 1996). The factor that should gauge genetic engineering should be based on a clear distinction and understanding of medical concepts like illness, health, disorder and disease. Furthermore, the concern should be on what effects does something has on capacity of someone's performance?

Joseph Fletcher, in Mappes (1981: 486), observes that "there is no moral reason why we must follow biological heterogeneity (diverse sources of genes) in all human beings, whenever homogeneity (a single source of genes) can serve a constructive purpose". To him the benefits set to arise from application to humans of genetic manipulation just as it is done to animals and crops serves as a moral justification. Genetic engineering, will help humans to limit genetic diseases, bypass sterility, predetermine sex, preserve family likeness, provide a means to get human organs as spare parts, and in the weight of such benefits he hastens to add; " it wastes time to argue over whether we should do it or not; the real moral question is when and why" (Mappes, 1981: 489).

Fletcher does not ponder about possible harms but merely bases his moral acceptability of genetic engineering on the benefits alone. His scale of analysis seems unbalanced without considering the risks.

Stephen Clark (2000) argues in great details about the numerous advantages possible from genetically engineering the stem cells, which are undifferentiated. The goal of genetic engineering is therapeutic rather than reproductive when it becomes possible to cultivate transplantable limbs and organs, nerve cells, hormones and suitably modified marrow cells. These are of considerable medical importance. Seen in this way genetic engineering is morally acceptable since it is concerned with cells that cannot suffer, causes injury to no one and no one's dignity will be impaired. Clark calls for proper sentiments and an open-minded approach to genetic engineering issue if it is expected to steer off the moral controversy.

The no-harm therefore-morally acceptable proposal by Clark is not convincing. The cells after being fused with the nucleus develops to become a pre-implantation embryo which has no feelings and certainly no sense of its own self-worth or social standing (Singer 1994). But this claim that there is no wrong done if no one is in a position to recognize any injury is at least debatable. Could it not be said that the implanted embryo and the eventual infant are the same entity? If so, it is that entity which is arguably, injured either by being born genetically determined or possibly with defects which it may have to endure as a result of it's unusual origin. Clark causes us to ask various questions like what is the moral status of the undifferentiated cells, germ cells and the embryo? Are the advantages accruing from germ cell genetic engineering all that matters for it to be morally worthwhile?

Edward Craig (1996) praises genetic engineering as an artificial facet that compliments the natural selection and evolutionary process as spelt out by Charles Darwin . Drawing heavily from Darwin as his authority in evolutionary science he asserts, "natural selection operates in

sexual population chiefly with heterozygotes. It will tend to make heterozygotes highly fit, even if the corresponding homozygotes are low in fitness. In other words natural selection promotes hybrid vigour or heterosis and maintains the variant genes in a state of balanced polymorphism. It takes a variety of genetic endowments to make a world worth living in. Natural selection cannot prevent the appearance of some individuals of inferior fitness. This is the duty of artificial selection by genetically engineering individuals" (Craig 1996: 295).

The inherent weakness of natural selection and the compounding effect of gene pool deterioration make genetic engineering practically and morally necessary. A response to Craig is that, first his conclusion is hastily drawn on a scanty sample of evidence and his claim is wrong since genetic endowments are affected heavily by the individual's surrounding environment and this is a point he cares not to consider. Craig considers no consequences that are likely to arise from genetic engineering application.

Richard Taylor, a catholic priest, and Robert Lanza (2000) a Christian theologian, opposes Craig and terms him as anti-creationist and a non-believer. Basing their argument on the sanctity of human life they declare " God wills man as a being similar to himself, as a person"(Taylor and Lanza, 2000: 15). They conclude that to tinker with the holy process of procreation is the highest immorality. Taylor and Lanza argue that good knowledge and the medical benefits resulting from genetic engineering cannot be compared with the special God-given and God-authored nature of man. Condemning Craig's proposal as pagan-oriented they conclude quoting the *Letter toFamilies* (2nd February 1994), by John Paul II that if no living being on earth except man was created " in the image of God" then man is the only creation on earth whom God willed for it's own sake. Quoting Immanuel Kant's

(1969) formulation of the classical moral theory that " always treat humanity, in ourselves as well as in others, as an end not merely as means", they concur that then no human being should be used merely as a resource or tool.

Taylor and Lanza's stinging criticism on Craig can be avoided safely on logical grounds. First they attack and analyse a scientific subject using religious tools. Their argument and quotations are from Christian religion and at no one time can they be safely used to criticize a scientific and technological issue without committing a logical fallacy. This is their leading weakness making them to commit the fallacies of *argumentum ad hominem*, (attacking the person) and *argumentum ad verecundium* (appealing to wrong authority) (Copi, 1996: 114-164).

Robert L. Sassonne (in Mappes 1995), citing heavily from historical incidences where abuse in the guise of scientific research, development and application are noted, argues that there is a grave possibility of misuse of genetic knowledge and genetic engineering technology. He argues that it will lead to segregation of the poor, the immoral choice of child's sex, unfathomable risks resulting from carelessness of the scientist in the laboratory and the impossibility of reaching a consensus for the good qualities. He critically questions the morality of psychological effects resulting from breakage of the generation's genetic link.

Referring to the controversy surrounding choice of qualities he notes the shift first from the French scientist later to Lenin. Sassonne points at this as a prejudicial criterion of an unnamed earlier writer on genetic manipulation and this prompts him to declare, "that we could not choose the qualities for the next generation unless we are not prejudicial,

unfortunately we are all prejudiced. The judge of the quality of men would have to be an angel" (Sassone, 1977: 110).

Sassone fails to analyse the pros and cons of scientific and technological advances in biomedical research. He overly relies on past misuse. This flaw greatly undermines his argument which at long last is concluded with an escapist tone. He absolves the current generation of any responsibility of judging the morality of genetic engineering by saying that "this is a duty of future posterity after more facts are known" (Sassone 1977: 112). He nevertheless provokes a variety of questions like how will it lead to segregation and discrimination of the poor and if so how can we avert this? Is it immoral to choose a child's sex? Are claims based on risks acceptable vis-à-vis genetic engineering?

Paul Ramsey in his article " Manufacturing our offspring: weighing the risks" in Mappes (1981) argues that the extreme possibility of damage and undue additional risks of deformity arising from the applied technique of genetic manipulation as in vitro fertilization , serves as a good moral ground for objection. Ramsey asserts: " A small risk of grave induced injury is still a morally unacceptable risk " (Mappes 1981: 478).

An objection based on a biological fact against his harm theory is that the developing life during and after genetic manipulation process is just in a cluster of cleaving cells. These cells have "tot potency". This means that since none of these cells in the *blastocyst* have reached a stage of specialization or has "clicked off" it's potency of differentiation and specialization, then as proved by biology it can renew itself even if momentarily injured. It's only after differentiation and specialization of each and every cell that the *blastocyst* now as a foetus

becomes more vulnerable to irreversible damage. Ramsey's harm theory fails to serve as an adequate moral objection to gene manipulation in the light of biological facts. But as the title suggests we need to ask "what is the risks of genetic engineering and how morally defensible are these risks. Are the risk set to arise due to genetic engineering more or less compared to natural procreation process?

Feinberg and Feinberg (1993), Holmes (1984), Ramsey (1996) discusses counselling for genetic engineering at great details. Feinberg and Feinberg (1993) define genetic counselling as " a communication process which deals with the human problems associated with the occurrence or the risk of occurrence of a genetic disorder in a family". According to the Genetic counselling committee (1995) there are "five basic goals of counselling; 1)To understand the medical facts, which include the diagnosis of probable cause of the disorder, and available management; 2) to learn about the way heredity contributes to the disorder, and the risk of recurrence in other relatives; 3) to know the options for dealing with the risk of recurrence; 4) to choose the course of action which seems appropriate to them in view of their risks and their family goals, and act in accordance with that decision; and 5) to make the best possible adjustment to the order in an affected family member or to the risk of recurrence of that disorder" (Feinberg and Feinberg 1993.: 255).

However these goals despite being noble, raise some moral difficulties. Among these is the question surrounding the use of information attained through genetic counselling (Pence 1996).Counselling from amniocentesis, or knowledge of family medical and genetic history can lead to a variety of options for example, abstinence from marriage, abortion of defective foetus, allowing defective new-borns to die (singer in Pence 1996) and psychological

problems leading to suicide. "Some of these options present ethical problems, and as a result, the morality of the whole procedure is questioned" (Feinberg and Feinberg 1993: 257). A calculation based on risks versus benefits, evils versus goods can assist in solving this problem rather than the whole technology. Such consequences should be weighed against the good that may likely arise from them.

Hurst (1999) discusses immoral consequences which make genetic engineering immoral for example the negative effects of directive and non-directive counselling, the probability of paternalistic tendencies (conflict of individual autonomy versus medical authority), dysgenic consequences from counselling, the conflict of interest between the affected person's welfare and that of future generations and the patient-doctor confidentiality.

Mc Donagh (2000), Kinitz (2000), Feinberg and Feinberg (1993) document the numerous uses of Recombinant D.N.A (gene splicing); ranging from production of substances important in health care, in agriculture, in industrial process and in genetic disease treatment. But if a particular gene is damaged or missing, Recombinant D.N.A technology may serve as the means for fixing and/ or replacing it. To them the greatest immorality will arise from "evil and worthless applications" (Kinitz 2000:18).

Holmes, (1983), Feinberg and Feinberg (1993) claim genetic engineering is hazardous, as it can be used to create harmful organisms, cause legal problems concerning lawsuits, legal redress about patents, wrongful life suits by children born defective, possibility of dangerously tampering with the gene pool (Burns 1983) or being used for eugenic purposes and to the concern of everyone who values democratic principles and liberalism in our

present society, the building of biological weapons (MacDonagh, 2000; Anderson, 1982). Feinberg and Feinberg (1993) raise the issue of immorality of patenting life. He claims that it is the origin and the greatest explication of human capitalistic mentality where drive for material wealth and greed rules supreme. These concerns, despite being worthwhile can nevertheless be well addressed by public policy. Furthermore, leading to such consequences cannot justify condemning genetic engineering as immoral.

Malyn (2000) and Powledge (in Mappes 1981) discuss the immorality that may arise due to the unforeseen consequences. This is what is called the slippery slope case. For example if we would agree diabetes, cancer and sickle cell anaemia are disorders, where is the logic that keeps us from claiming that colour blindness, left handedness and skin colour are disorders to be corrected by redesigning our genes? The slippery slope arguments imply two principles, a principle of momentum and one of logic. The principle of momentum says that once x is done, it will be hard to refrain from doing y, even if x does not entail y. The logical principle states that "y will inevitably follow from x, since doing x contains the "principle of permission" for doing y" (Feinberg and Feirnberg, 1993: 282). Malyn and Powledge appear to be thinking only about the negative consequences that may result from the application of genetic engineering. With a good policy, regulatory frameworks and guidelines, such steep slopes cases can be curtailed. It may appear naïve to ban or stop genetic engineering on such flimsy grounds.

Tabitha M. Powledge (in Mappes 1981) raises other numerous ethical issues related to recombinant DNA research and its application. Due to the possible equal risks that may arise out of reckless and uncontrolled recombinant DNA research there is a dire need for a

moratorium and guidelines to direct the code of conduct to prevent possible misconduct and misuse.

She notes that the troubling issue of safety can be resolved not by outlawing research and application as this is fruitless but by pressing for the toughest possible restrictions to reduce risks. Powledge argues that for now issues of risk are peripheral as the more fundamental, question " deals with the morality of future designed, genetic change particularly designed genetic change of human beings." (Mappes, 1981: 466). Powledge's steep slope argument is that man may nobly cure genetic diseases by gene substitution but sooner than later direct the evolution of all creatures humans included. She argues that the immoral foundation of genetic engineering is that " it makes man to arrogate to himself God's duty of controlling the universe". (Mappes 1981: 468).

Powledge does not show why first it is wrong for man to control himself and secondly the wrongness of arrogating to himself God's duty. Unfortunately, despite raising such a fundamental question of morality of future designed genetic changes in human beings, she hardly bothers to answer it.

Leon R. Kass (in Mappes 1981 and in Shannon 1976) observes that the recent advances in biology and medicine suggests that man may be rapidly acquiring the power to modify and control the capacities and activities of men by direct intervention and manipulation of the genes of their bodies. Kass accepts genetic engineering as moral and beneficial since it is for the "betterment of mankind". The guaranteed potential effects of dehumanisation and degradation are minimal and cannot serve as serious hindrances to the moral acceptability of

genetic manipulations. He prompts one to ask how is man dehumanised and degraded by genetic engineering technology? What is meant by the claim "betterment of mankind"?

Assessing available literature, some analysts concern themselves with the issue of " should we" by analysing pros and cons of genetic engineering. This leads to a multiplicity of contradictory results due to the varying perspectives used. The reason for declaring genetic engineering as necessary and justified as an alternative technical means of controlling human reproduction and on what grounds do those reasons arise requires a unified approach of analysis. This calls for an organized, all encompassing and a harmonious approach with which to assess the ethical foundation of genetic engineering. Without such an approach the controversy will not only reign but also unprecedentedly deepen. This will hinder our ability to reach at an impartial judgment concerning the moral foundation of genetic engineering on human beings.

1.7 Scope and limitation

The scope of this study is the analysis and explication of the nature and foundation of the morality of genetic engineering in human reproduction process. The limitations of this research study are lack of enough time and resources that are vital factors necessary in any research. Nevertheless these limitations will at no one time compromise the quality of this study.

1.8 Theoretical Framework

The theoretical framework to be adopted is utilitarianism. This refers to the moral theory that there is one and only one basic principle in ethics; the principle of utility. This principle

asserts that moral agents ought, in all circumstances to produce the greatest possible balance of value over disvalue for all persons affected (or the least possible balance of disvalue if only evil results can be brought about).

Utilitarianism as enunciated by its founders David Hume (1711-76), Jeremy Bentham (1748-1832) and John Stuart Mill (1806 –73) gauges the worth of actions by their consequences. This lead to various interpretations of ultitarianism like " the end justifies the means", "promoting the greatest good of the greatest number." When utility is interpreted as "usefulness" then "what is right is that which is useful" (Taylor in Mappes 1981: 15). In some respects each of these popular characterization is accurate, but utilitarianism is more sophisticated and refined.

Utilitarians share the conviction that human actions are to be morally assessed in terms of their production of maximal non-moral value. At a given circumstance, what value could and should be produced, the utilitarians agree that it is the production of what is "intrinsically" valuable rather than "extrinsically" valuable, that counts in the moral calculus (Shannon 1976). That is, what is good in itself and not merely what is good, as means to something else ought to be produced.

An intrinsic value is a value in life that is wished to be possessed and enjoyed just for its own sake and not for something else, which it produces. An extrinsic value is that which is "wished for by virtue of being merely good as a means to something else which is considered intrinsically good" (Beauchamp, 1979: 22)

1.9 Hypothesis –

This study is guided by the hypothesis:

(i) That genetic engineering is morally founded on the principle of quality of life.

1.10 Methodology

This is solely a library-based study focussing on secondary sources of data from the Internet, books, journals and magazines related to the topic under discussion. Since philosophy's unique aspect is accepting nothing without first thoroughly examining all attendant assumptions, in order to clarify and resolve the fundamental ethical issues entailed in genetic engineering , this research utilizes the distinctive philosophical method which is explication and critical assessment of arguments , concepts and cognate issues.

CHAPTER TWO

PAVING THE WAY: A REPLY TO CRITICISMS AGAINST GERM CELL GENETIC ENGINEERING.

2.1 INTRODUCTION

Genetic engineering technology has been fraught with mainly ethical, technical, religious and social objections. These objections block the possibility of it being applied in the process of human reproduction. It is expedient therefore to address these objections, as they are pertinently significant.

These objections form a major blockade against the establishment of the foundation of the morality of genetic engineering.

There is need to know why and how these criticisms do not count morally against the going ahead with genetic engineering. This is vital in the development of a fruitful discussion about the morality of genetic engineering. The objective of this chapter is to present the criticisms and then assess their logical defensibility to see if they count morally as worthwhile for or against the going ahead with the application of genetic engineering technology.

This chapter is justified in that it will pave the way for an open and free discussion concerning the morality of genetic engineering. The contention here is that before assessing other grounds upon which to justify genetic engineering, there is need to establish if the existing objections are really counting and if so how and why.

2.2 A PRIORI VERSUS A POSTERIORI (PRAGMATIC) ETHICAL FRAMEWORKS OF ANALYSIS

The objections against genetic engineering are based on either a priori *(non consequentialist)* or a posteriori ethic (consequentialist). A priori is rationalistic while a posteriori is empirical or pragmatic. That is rationalistic versus empirical or pragmatic ethics.

Whenever human beings are required to decide about an act as being right or wrong, or desirable or undesirable, principally two alternative ethical approaches can be used. In genetic engineering debate the question is whether I should use a posteriori or a priori ethical approach in discussing its morality. Put in another way, am I to reason from faith and metaphysical propositions to normative decisions, or am I to reason from empirical data, variable situations and human values to normative decisions? Bearing in mind that genetic engineering is under medical ethics, it is appropriate to use the latter type of reasoning of empirical data, varying situations and human values to normative decisions. This means the adoption of a consequentialist pragmatic ethical frame work of analysis.

Until modern times the most common form of a priori ethics was religious morality which approaches issues in such an advance manner that certain kinds of acts are intrinsically wrong. Their inherent wrongness was believed by faith and by metaphysical opinion to be a matter of natural moral law or divine revelation (Holmes, 1984: Wallace, 1977). They were always negative, never affirmatives – prohibitions, not obligations. These moral laws were claimed to be apparently known to the moral agent through inner guidance or intuition and special revelation like scriptures. Being right or wrong was predetermined by a religious, metaphysical or non-empirical kind of recognition. This is what can be referred to as meta-

rational or a priori ethical approach. Meta-rationalists are non-consequentialist. They argue, " therapeutic or corrective goals are not enough to justify genetic engineering, no matter how desirable the consequences might be" (Feinberg and Feinberg 1993). The basic moral law here is the religious belief that only God can create and as such "anything concerning our well being is under God's obligations."(Ramsey 1978) This is a "law of divine monopoly" and opposed always to any form of human control of sexuality.

To the a priori moralist desirable and good consequences could not justify genetic engineering interventions since such acts or procedures are wrong as means. To the 'a priorists' the contention is that "the end does not justify the means". The much-acclaimed principles like proportionate good could not in their ethics make genetic interventions morally permissible. Consequences to them do not assist in right – wrong deliberations. The "a priorists" opposition to the control over human evolution and procreation by use of genetic engineering is because they believe that "reproduction through heterosexual human intercourse within the context of marriage institutions and family is the only morally licit one" (Fletcher in Shannon 1976, Hughes 2000).

Some ethicists such as Ramsey, Kass and Fletcher (in Shannon 1976) argue that the moral choices based on generalisations reached empirically or clinically are partially a priori and partially a posteriori. My conviction is that these choices are a posteriori not a priori because they are demonstrable and supportable by cumulative data from experience.

In the approach and examination of the objections levelled against genetic engineering I am proposing to adopt the a posteriori (consequentialist) ethical approach. It is sometimes called

"the ethics of pragmatism". It is sometimes sneered at by apriorists and called a "mere morality of goals" (Fletcher in Shannon 1976:331). I propose to utilize this approach because in medical ethics persons reason from the data of each actual case and then choose the course that offers optimum desirable consequences. It is impossible to reason by a priori means in the case of medical ethics. In this connection I re-echo Jeremy Bentham's words, "If any act can with propriety be termed pernicious, it must be so by virtue of some events which are its consequences... no act strictly speaking, can be evil in itself" (Fletcher in Shannon, 1976:331). For the "situational" or clinical consequentialist results are what count and results are good when they contribute to human well being (Hughes 2000). The concern of genetic engineering is what good it will bring about over and above the natural selection process.

2.3 REPLYING TO THE OBJECTIONS

In this section the focus of analysis is on the most morally compelling objections. The objections to be discussed under the a posteriori ethical framework are technical, lack of a selection criterion, degradation and dehumanisation, possibility of misuse and religious objections. A posteriori ethical framework promises to resolve the objections "pragmatically through public policies in a liberal and democratic society" (Hughes 2000:2; McDonagh, 2000:4). The method is to present each objection and then attempt a critical examination to assess its tenability and then offer the solution.

2.3.1 TECHNICAL OBJECTIONS

Genetic engineering has been condemned as risk-prone and therefore morally unfit to be applied on humans. (Jones, 1974; Anderson, 1996; Council for Responsible Genetics 1996;

Burns 1983; Shannon 1976; Singer in Mappes 1981). From the extrapolations on animal experimentation, it is argued that the process is risk-prone. Also the results are unpredictable and the probability of physical and psychological damages to human beings are immensely certain.

The process of gene and chromosomes manipulations involves the technique of microinjecting the cell with a foreign D.N.A molecule (Council for Responsible Genetics, 1996). Other related processes of gene manipulations and which are considered also to contribute to the possibility of physical damage are genetic screening and freezing of reproductive cells and the pre-embryo (Anderson, 1996).

The other source of risk is the technical inaccuracy and the general carelessness in the laboratory. This is where the scientist involved may not know the precise consequences that are likely to result from microinjecting the germ cell with a foreign molecule (Council for Responsible Genetics, Anderson, in Mappes 1996).

The psychological damage to the child, and any other effect on human beings resulting from this process is harmful when he comes to know that he was conceived through such an "unnatural" laboratory based process (Ramsey, Fletcher, Kass in Shannon 1976). According to the Council for Responsible Genetics (1996), genetic link breakage between the parent and the child will have devastating psychological effect and may lead to strains on inter-family and interpersonal relationships.

The reply is that genetic link even in the natural process of procreation is not continuous but discrete, since the child results from a random chance of gene combinations. Denying any possibility of concrete genetic link between parents and their offspring. Tullar, (1977:386) writes; "All that a parent actually gives a child is a random haploid set of chromosomes. Even these random chromosomes are not the same as those the parent received at conception because they have been altered by mutation. A parent is merely the temporary custodian of a haphazard sample of chromosomes ...".

It is with ease to rebut the objections based on the possibility of technical risks, if we consider the evolution of technology. Genetic engineering just like any other emerging technology has to undergo numerous stages towards ultimate levels of perfection. At first it must be crude and uncertain but it is continuously improved to such a high degree of precision and perfection.

Where human beings are involved as required by many scientific protocols, the technique requires a high level of ultimate perfection in order to avoid them being exposed to unwarranted risks and damages. Before being applied to human beings, any technology is tested extensively on animal. The data compiled from animal experiments assist in making extrapolations on how suitable it is and if it is in need of any perfection.

The problem of false positives and false negatives, that is, the indeterminability of the precise consequences it will have on human beings requires initial experimentation on informed and consenting human adults. At these crucial stages when it is either to be or is being experimented on human beings, in order to achieve the ideal efficiency, claims of risks and

damages do not hold because the expected level of perfection is not yet arrived at. Therefore, it is immature to condemn an experimental technique when it is on its infancy.

The claim that genetic engineering is risky to the offspring and the posterity in general is one "that will not be argued for with great force before such a technique becomes widely used with tangible consequences" (Singer in Mappes, 1996). It is the qualitative effects on the offsprings that will determine whether it is risky or not. The consequences and not apriori claims will enable the determination of whether it is morally, worthwhile or not.

It is wrong to condemn genetic manipulations as risky basing such claims on the extrapolations from the experimental data on animals like "Dolly the Sheep" which was possible after two hundred and seventy seven dismal trials (Times 1996). This is not convincing because as much as admitting the veracity of such data it does not hold absolute truth that similar outcome on human beings will follow. To arrive at such a conclusion basing it on such infinitesimal evidence is to commit the fallacy of hasty generalization. It can be argued strongly against the objections based on technical risks because it is known that an analysis of risks and damages should be grounded on empirical data, which is not yet possible before the application of the technology.

The history of the development of technology shows that it is the utility or the benefits that lead to the moral acceptance of a given technology. This is corroborated by the initial moral controversies that surrounded *in vitro* fertilization, dialysis machines and organ transplants. After demonstrating their clinical benefits they have now become morally acceptable means of treatments. This is what I may call the "moral epistemology of medical advances". This

shows that the morality of a given technology is known after accumulating the data of how medically useful it is (Shannon 1976).

2.3.2 OBJECTIONS BASED ON LACK OF A SELECTION CRITERION

Genetic engineering it is claimed leads to numerous ethical problems which are irresolvable in the present political, social, economic and ethical context and for this reason, the opponents prefer that the programme be shelved or postponed to a future date when the society will be in a position to deal ably with such cases. (Anderson 1996; Council for Responsible Genetics 1996; Shannon 1976; Ramsey 1978; Taylor and Lonza 2000).-

The opponents charge that there is no feasible ethical criterion which can be used to select the good and bad genes and from whom (Sassone, 1981; Council for Responsible Genetics, 1996). Further it is charged that any attempt to construct such a criterion and any effort to determine and deliberate on what are the good or bad genes will only lead to entrenching and increasing the current social, economic, cultural and political biases, inequality and prejudicial discriminatory practices (Anderson, Council for Responsible Genetics in Mappes, 1996; Fletcher in Shannon, 1976).

The reply is that first, shelving or postponing the application of genetic engineering because it is fraught with ethical problems is inappropriate. Postponing has never empirically proved to be a viable rational solution to pressing problems. It only assists in the delay of urgently needed moral decisions. Procrastinating is not a rational recourse in the event of encountering ethical hindrances. The sooner an ethical issue arises the better it should be

esolved. For anyone in possession of reason, shelving or postponing is proverbially "to ›ury one's head in the sand."

:oncerning the argument that there is no feasible ethical criterion for selecting good and bad enes and from whom, I am proposing to draft a criterion that will be ethically feasible, esirable and practical. This is only possible in a democratic and liberal society where eople have to broadly admit and agree on what is the ideal goal of living. The goal of living, am convinced is to lead a worthwhile, prolonged and fulfilling, pain-free and pleasure-filled r in short a quality life (McDonagh, 2000; Shannon, 1976; Singer 1996; Kinitz, 2000). The oncept of quality life is vital in coming up with a criterion through which good and bad enes could be identified and selected.

he basic criterion that ought to be adopted should be simply a "quality of life oriented" Singer, 1994; Singer in Mappes, 1996). What this means is that the genes should be selected" on the basis of how useful they will be in promoting a life that is good, desirable, ee of diseases, defects, "enjoyable and more so worthy to be lived by humans" (Harris 985; 219).

is a grave misconception to talk about the source from which to select genes in the context genetic engineering. This is because the genes are not selected *per-se* but they are onstructed" in such a way as to fulfil a design, which will lead to their expressing the sired consequences (Ugincius, 1994). The biotechnologist cuts out the existing gene gment and replaces it through recombinant – D.N.A technology with a new artificially nstructed gene molecule (Powledge, 1981; Burns, 1983; Mappes, 1981). The technical

feasibility to "culture" and "construct" any type of a D.N.A molecule and hence make any number of recombinations using the four base pairs of a gene molecule (Burns 1983), demonstrate that to talk about gene selection from certain people is a misconception or ignorance. The Recombinant DNA technology eliminates the need to select genes from certain people. It enables the direct construction of the genes themselves.

Therefore, the selection criterion for the genes will be based on "quality of life". With the aim of assisting to overcome the shortcomings of natural selection (Burns, 1983; Glass, 1972), genetic engineering should be used in overcoming the genes' natural debilitating effects (Tullar, 1978). In relation to this disquisition it is the elimination of the debilitating and disabling genetic diseases, defects and disorders and the positive enhancement of the capacities that can assist in mastering, exploiting and benefiting mankind from the natural resource endowments (Mitcham and Mackey, 1972) that can count as justifying and necessitating the application of genetic engineering. The genes that ought to be selected for construction and eventual injection into the germ cells are those that can lead to the realization of the stated goal of leading a quality life. In this way quality life is the intrinsic good aimed at by genetic engineering.

I do not foresee the possibility of any controversy regarding the decision of whether some genetic endowments and some qualities like intelligence, height, and disease resistance contribute to quality life. But some genes will be controversial, whether they will contribute to quality life for example voice, eye colour and skin colour. Not unless each and every individual will be willing to be morally responsible, honest and outright and reject the trivial nature of some qualities sought, then this problem might be inescapable. It is my earnest

desire and hope that the world will come to appreciate and accept the virtues of a heightened moral responsibility and transparency in the face of genetic engineering.

2.3.3 OBJECTIONS BASED ON DEGRADATION AND DEHUMANIZATION.

Genetic engineering has been opposed because it will lead to "dehumanisation" and "degradation" (Kass, Fletcher in Shannon 1976; Ramsey and Murray in Mappes 1981). Procreation process is seen as sacrosanct and sacred. Genetic engineering, it is observed will involve the use of "Laboratory and its tools" which is "dislodging procreation from the marriage institution" and any resultant child from such a "technical manoeuvre" is more of a "technical product" (Kass, in Shannon 1976:299).

This technical interference on the process of procreation renders it and its products inhuman and dehumanising. Because of genetic engineering, people will be prone to seeing the genetically defective as "unfit to be born" and this will be a "threat to the radical moral equality of all human beings" (Ramsey and Kass in Shannon 1976:295). The process of genetic engineering will incline people to take a more negative view of those genetically defective or otherwise abnormal. This further will predispose treating them in a second-class manner (Mappes 1981; Kass in Shannon 1976).

I do not accept such objections because there are no demonstrable reasons to show that genetic engineering alone will promote and encourage dehumanisation and degradation unlike other radical medical intervention. It is the effects of genetic diseases and defects that can aptly be said to lead to dehumanisation and not the medical intervention like genetic engineering. If germ cell genetic engineering can be objected to on such claims of

dehumanisation and degradation then the same should apply to the whole range of medical interventions. This is *reductio ad absurdum* and it is fallacious. Therefore degradation and dehumanisation are incongruous objections.

On another count, objections of dehumanisation are rendered ineffective by the words of Fletcher (in Shannon 1976) when he addresses Kass (in Shannon 1976) thus; 'what does it mean to say as Dr. Kass does, that "Laboratory reproduction of human beings is no longer human reproduction". (Indeed, can he reasonably charge that laboratory reproduction is non-human and still call its products human beings?). Man is a maker and a selector and a designer, and the more rationally contrived and deliberate anything is the more human it is. Any attempt to set up an antinomy between natural and biological reproduction, on the one hand, and artificial or designed reproduction, on the other is absurd. The real difference is between accidental or random reproduction and rationally willed or chosen reproduction. In either case it will be biologic-according to the nature of the biologic process. If it is "unnatural" it can be so only in the sense that all medicine is. It seems to me (Fletcher) that laboratory reproduction is radically human compared to conception by ordinary heterosexual intercourse. It is willed, chosen, purposed and controlled, and surely these are among the traits that distinguish Homo Sapiens from others in the animal genus, from the primates down. Coital reproduction is, therefore, less human than laboratory reproduction-more fun, to be sure, but with our separation of baby making from lovemaking, both become more human because they are matters of choice and not chance. I cannot see how either humanity and morality are served by genetic roulette" (Fletcher in Shannon, 1976: 335 – 6).

On another occasion, dehumanisation and degradation are what man will have to "trade off" and become the basis of calculating the "opportunity cost" in order to be assured of quality life. In this connection Mesthene in Mitcham and Mackey (1972:116-117) writes, "when new tools emerge and displace older ones, however, there is a strong presumption that there will be changes in nature and in society. Opportunity costs are involved in exploiting any opportunity, and therefore also the opportunities newly created by technology. In so far as the new options are chosen and the new possibilities are exploited, older possibilities are displaced and older options are precluded or prior choices are reversed. The presumption, albeit not the necessity, that most of the new options will be chosen is therefore at the same time a presumption that the choice will be made to pay the new costs. Thus whereas technology begins by simply adding to the options available to man, it ends by altering the spectrum of his options and the mix or hierarchy of his choices"

From the above quotation it is explicitly clear that it is impossible to embrace genetic engineering technology without affecting such human values like dignity. My conviction is that the quality of life serves a higher good than assurance of dignity and humanity which however arises from the former. Once more, degradation and dehumanisation fails to serve as a morally significant objection to stop the application of genetic engineering.

2.3.4 OBJECTIONS BASED ON THE POSSIBILITY OF MISUSE.

The opponents of genetic engineering cite numerous instances where noble scientific findings have been misused with disastrous consequences like the case of "Agent Orange" (Burns, 1983:436) in Vietnam. In the guise of science and research, atrocities have been perpetrated like in the Nazi Germany under Hitler, where the aim was to create a superior

race. The opponents feel convinced that genetic engineering will also be prone to misuse. Shannon (1976), Mappes (1981), McDonagh (2000) cite a hypothetical example where a despotic leader may misuse genetic engineering to create a "docile population" for political gains or select the birth of men only in order to be able to maintain large armies.

The reply is that it is odd to think of such magnitude of misuse. This is because it would be a costly venture and time consuming. Such a patient leader has to wait for over eighteen years and requiring millions of people in order to realize his political plan. Also under a democratic, liberal and participative society with a hand in the regulation of genetic engineering such a possibility of misuse is minimal. This is not a worthwhile objection as it is impractical and very unlikely in real life. Strict guidelines and regulatory bodies like Federal Drug and Food Administration (FDA) of America can curtail this misuse. The possibility of misuse should not stop genetic engineering benefiting mankind by enhancing their quality of life.

2.3.5 RELIGIOUS OBJECTIONS

The severest objections against genetic engineering are from Christian and Islamic religion. The basis of these two religions is the belief that there is a supreme being who is the creator and sustainer of beings. According to the Christian faith , man is different from other created beings by virtue of the fact that he is the only creature created in God's image and as such he is the only creature that "He willed for its own sake" (Taylor and Lanza, 2000). This special origin that man is God-authored and in God's image is the root of the claim of the sanctity of human life. As such it is wrong to interfere with what is God's duty and concern, that is, it is God's duty to sustain and create life (Lanza and Taylor, 2000) and it is immoral for man to

"play God" in his attempts of using scientific technological knowledge in "imitational creation" of human life (Cook, 1968; Powledge in Mappes, 1981).

Taylor and Lanza (2000; 38) claim that the sanctity of human life is even attestable in God's command that "sex is purposively for the institution of marriage when it binds two persons into one and from such a union procreation is possible". For them to create life using genetic engineering other than natural sex is illicit.

The reply to the religious objection is that first it is imperative to note that in genetic engineering no life is "created" *per se* but rather genes are manipulated or as they would put it "tinkered with" in such a way to express the desired character trait. Secondly religious objections are difficult to defend "outside the confines of particular religions" (Singer in Mappes, 1996:527) and also difficult to defend outside the "confines of particular moral frameworks" considering that this is an era of moral pluralism. Nowhere else can the religious objection have weight other than within the confines of Christian and Islamic religions and within the confines of the religious ethics or religious morality. The ethics of Genetic engineering ought to transcends these confines. As Singer, (ed) 1994:5) puts it "Ethics has no necessary connection with any particular religion, nor with religion in general... ethics exists in all human societies, and perhaps even among our closest non-human relatives as well. We have no need to postulate gods who hand down commandments to us, because we can understand ethics as a natural phenomenon that arises in the course of the evolution of social, intelligent, long-lived mammals who possess the capacity to recognize each other and to remember the past behaviour of others."

The above reasons shows why religious objections cannot appropriately rebutt genetic engineering. The purpose of the whole range of modern medicine including biotechnology is to ensure the prolongation of a quality life, which appears to be a goal quite contradictory to the beliefs of religious proponents. If God has the duty to create and sustain a life then man has neither a role in ensuring its quality nor its prolongation. Religious opponents claim that genetic engineering contradicts the religious teachings. If human beings are willing to reject genetic engineering because it obstructs religious teachings, they would with equal force reject the whole of modern medicine. This is a view which is quite absurd and in direct conflict with conventional wisdom. If modern medicine by aiming at prolongation and enhancement of the quality life contradicts religious faith and teachings, then the ultimate rejection of modern medicine is the logical conclusion. This is another instance of *reductio ad absurdum*. No rational person would believe the veracity of religious objections.

t is important to distinguish "biological" and "spiritual" life. If man is God - created does he ıave a biological and a spiritual life as distinct entities or as the same entity?.

t is easy to deny the possibility of "spiritual life" considering the many different religions ınd even paganism. Does this mean that according to each religion there is a different piritual life for example "Christian spiritual life" and a "*Mungiki* spiritual life"? If this is ogically absurd then it is safe to argue that man has only a biological life, which is an mpirical reality. This biological life is not different from that of other creatures, and it is not vrong to "manipulate" it. If in genetic engineering the concern is with the biological life then he claims of sanctity and special origin of human life appear ill-founded and holding no veight against the going ahead with it.Another point is whether God has any obligation in

relation to human procreation. Is God obliged by anyone or anything and is it intelligible for anyone to talk of God's duty?

In response to the above question, it is hard for God to be obligated to anything including men. The qualities ascribed to God and by his very own nature man cannot claim rights on Him. If man cannot claim any rights from God because there is no ground upon which he can lay such a claim then it means, he has no rights and therefore God has no obligations or duties towards him. This exposition that there is no grounds for God's obligations to man means that the talk of procreation as God's duty is a misconception.

Paul Edwards (1967:419) explicates the concept of moral responsibility thus; "A person is regarded as morally responsible for some act or occurrence x if and only if he is believed first to have done x, or to have brought about x; and second to have done it or brought it about freely. But there are some duties, such as duties of benevolence when no one has a corresponding right to demand that they be performed." If there is no ground for claiming rights to God, do people in such cases have a right to that which they cannot demand to be done? As earlier shown having faith in God is a matter of option. If a person opts to believe then God has duties otherwise he does not. The concern here is whether God's duties are demonstrable in any way. Having mere belief is not enough that he will fulfill such duties.

Logically if God has neither duties nor any obligations with regard to procreation then it means that genetic engineering, as a technique is not immoral, as it violates neither God's duties nor obligations. Therefore, claiming that genetic engineering interferes with the

sanctity of human life or is "playing God" cannot intelligibly be a good reason to prevent man from going ahead with it.

The talk about God's duties and obligations is a contradiction in the face of genetic diseases and disorders on the one hand and the qualities of God on the other. This leads to a contradiction if I think of man being in God's image and God as the ultimate perfection and having duties and obligations to ensure every man's good health by virtue of his perfect nature. When anyone suffers a genetic defect or disease while others are normal and free of such disease then this implies that God has failed. This means that also he exercises his powers in the course of fulfilling his duties and obligations in a capricious and discriminatory manner and therefore He is unjust. I cannot comprehend a capricious, discriminative, failing and unjust God. In the course of one suffering genetic diseases, one can lay claims of right to good health from God. Man can demand his rights, which God has failed to fulfill. Apparently this cannot be true. Therefore, God has neither obligation nor duties towards man's process of procreation. Man is therefore free to control it.

The religious objection that it is wrong to apply genetic engineering is quite absurd and also contradictory. Such an objection begs the question; what do we mean by concepts like duty", "obligation", "right", and more importantly when applied to God? Such an objection also begs the question; what is the need of human intelligence in the face of natures' adversities? I concur with Peter Singer (in Mappes, 1996: 526) that if anything is in accordance with the nature of human beings then, "it is the application of our intelligence to overcome adverse situations in which we find ourselves". Religion should not be allowed to wag its ugly head as in the medieval times, when science was subservient. It attempts to

curtail the freedom of scientific research, development and application of quality of life granting technology. Religion in the context of genetic engineering is inconsistent with human realities and should be discarded.

2.4 ETHICAL STARTING POINTS FOR A DEFENSE.

It is vital that in this analysis of the moral foundation of the genetic engineering, I investigate the grounds upon which to construct the arguments for its defense. These are the ethical starting points for a defense. These are the rule utilitarianism, justice and a better society, freedom from biological necessity, and privacy, self-determination and bodily autonomy.

2.4.1 RULE UTILITARIANISM

Rule utilitarianism states that an act is right if it conform to valid rules of conduct and wrong if it violates such rules. Utilitarianism states that an act is right if it leads to the greatest good or happiness for the greatest number. According to Taylor (1975) it is the test of utility that determines the validity of rules of conduct. Germ cell genetic engineering's utility is underlined in its unqualified promise of quality life to the future generations. In this respect, promising and ensuring quality life is the rule of germ cell genetic engineering. Its promise to extend this promise to each and every individual (the greatest possible number) is its foundation on utilitarianism.

Germ cell genetic engineering will give people longer, healthier lives with more choices and greater happiness (Feinberg and Feinberg, 1993; Pence, 1995; Shannon, 1976; Mappes 1981). The direct control of the body and mind through germ cell genetic engineering can

lead to immeasurable good (Hughes 2000:5). The search for such a good is a defensible rule of conduct.

2.4.2 JUSTICE AND A BETTER SOCIETY

According to Williams (1972) justice is fairness. Justice can be conceptualised as right and fair behaviour or treatment or the quality of being reasonable. Where justice is allowed to prevail, it is agreeable that one can expect that to be a better society.

Germ cell genetic engineering promises to set foundations for a truly democratic society. By acknowledging that the biological factors in most forms of inequality are probably slight, germ cell genetic engineering promises to create a more equal society simply by "eliminating congenital sources of illness and disability that create the most intractable forms of inequality in society" (Easton, 1997: 269). The society can go to a great length to give the ill and disabled full access to society, but their disabilities place limits on how equal their social participation and power can be. The knowledge and ability to ameliorate these sources of congenital inequality imposes an obligation on the society to apply germ cell genetic engineering to those cognitive impaired and incompetent (Kinitz, 2000). The principle concern here is that germ cell genetic engineering promises to make it possible to give the citizens the physical and cognitive abilities for equal societal participation. This will bring about an enhancement of the abilities necessary to an empowered citizen. These elements are vital for the foundations of a truly better and just society (Hughes, 2000:15).

2.4.3 FREEDOM FROM BIOLOGICAL NECESSITY.

Germ cell genetic engineering promises freedom in two broad ways. First germ cell genetic engineering promises to empower human beings to determine the genetic source and makeup of their offspring unlike presently where nothing but random chance rules supreme. It will be possible to choose, correct and even impart the desired genetic qualities courtesy of genetic engineering. The blind forces of nature have been condemning man to a kind of a biological necessity of chance far from his reach or control. The capacity to choose a certain genetic makeup is a guarantee towards exercising freedom free of biological determinism or necessity of fate. Secondly, by extricating human beings from biological necessity, germ cell genetic engineering promises biological freedom and self-determination.

Those factors wholly or partly determined by biological necessity pales before germ cell genetic engineering. For example, as Kinitz (2000:14) notes, "social domination pales before the domination imposed by the inevitability of birth, illness, ageing and death; burdens that germ cell genetic engineering offers to ameliorate. The goal of germ cell genetic engineering is to move human beings from the realm of biologic necessity to the realm of freedom since it has libratory power. Germ cell genetic engineering promises to ameliorate the social domination that has some biological determinants like patriarchy, which is partly based on women's physical vulnerability and their special role in reproduction.

2.4.4 PRIVACY, SELF-DETERMINATION AND BODILY AUTONOMY.

It is accepted as a general rule that "liberal societies which allow maximum self-determination will maximize social utility" (Hughes 2000:5). The right to self-determination dictates that society should have justifiable reasons before interfering with competent

individual persons who may opt to apply germ cell genetic engineering to themselves. Self-determining people, capable of independent autonomous decisions about their well being should be allowed the privacy to do what they deem fit with their bodies, except when they are not competent, or their actions will cause great harm to others (Hughes. 2000; Mill, 1969). The aims of germ cell genetic engineering do not amount to a clear and present danger to the public safety adequate to legitimize the violation of bodily autonomy and personal liberty.

My belief is that the capacity for self-determination to achieve quality life through individual autonomous decisions can address most of the problems against germ cell genetic engineering. The concern here is that people should not be forced to conform to eugenic policies. This should not be accepted in any democratic society. Individuals should not be forced to modify their own or their children's genome. It is in this relation that the UNESCO International Bioethics Committee, (1995:201) declares, "No intervention affecting an individual's genome may be undertaken whether for scientific, therapeutic or diagnostic purposes. without prior, free and informed consent of the person concerned or, where appropriate, of his or her duly authorized representatives guided by the person's best interests". This shows the ultimate ideals that a liberal and democratic society should adopt in the circumstances of exploiting germ cell genetic engineering.

In this chapter, I have presented a critical analysis of the ethical, social, religious, claims of dehumanization and degradation, and technical objections using a posteriori (pragmatic) ethical framework. Under the ethical objections, I have shown how "quality of life" concept as a part of the a posteriori ethical framework, can assist in the construction of an ethical

criterion applicable in selecting genes. It was established that technical objections namely, the possibility of risks is unsupportable especially in the early stages of experimental application when the technology is evolving towards perfection and precision. From the analysis dehumanization and degradation are inevitable and necessary evils upon which human beings will be required to assess their "opportunity cost". That is what they will have to forego in order to gain quality life. It was established that religious objection is founded on a misconception of what terms like duty, obligation mean when applied to God. From the discussion the conclusion is that man has a duty to control his own evolution through the process of reproduction. The findings indicate that there is none of the objections that can be considered as a serious moral objection against the going ahead with applying genetic engineering. In a liberal and democratic society these objections are solvable under a posteriori ethical framework of analysis. The possibility of misuse by despotic governments is a justified fear rooted in historical incidences. The difficult issue is to defend if there is a causal link that the past will be like the future. The fact that there have been misuse before does not justify future misuse. That is there is no logical connection between the past and the future. In the foregoing analysis I have established that there is a higher moral good to be served by guaranteed quality life from the utility of genetic engineering and therefore these objections should not curtail its application. It was showed how rule utilitarianism, justice and a better society, freedom from biological necessity, and privacy, self determination and bodily autonomy provides the ethical starting point for defending genetic engineering if it is practiced in a liberal and democratic society. The way for the application of germ cell genetic engineering has been cleared after replying to the objections, but in order to balance the moral equation there is need to establish the utility of genetic engineering. This is the topic, which I will discuss, in the next chapter.

CHAPTER THREE

THE UTILITY OF GENETIC ENGINEERING

3.1 INTRODUCTION

In the previous chapter, I have presented and reviewed the arguments against genetic engineering as propounded by the opponents. What was apparent as the strength of genetic engineering is the relevance of the concept of usefulness or utility in the quest for quality life.

The intention in this chapter is to examine the nature, meaning and the moral significance of the utility of genetic engineering under a utilitarian pragmatic ethical framework. The concept of utility is vital in assessing the moral foundation of genetic engineering. The significance of this chapter is that it will form the basic foundation upon which the morality of technological advancements can be assessed by analysing the concept of their utility. This is justified because unlike a mere human act, here the concern is the dilemma of choice on how to exploit a technical advancement. That is, in other words how to determine the morality of choosing how to apply a technological advancement. Unlike a mere human act like stealing or prostitution, technology requires a "heightened" norm of assessment. Right from the start, I am advancing the arguments in favour of the concept of utility as one of the standard of the assessment of the morality of genetic engineering. The term utility elicits the idea of focusing on the consequences. It is within the consequentialist ethical framework that the moral significance of the concept of utility will be analysed.

In the first part, I will attempt a definition of the concept of utility. In the second part the discussion will be on the moral worth of utility of genetic engineering. In this part the analysis will be on the medical utility entailed in diagnosis, testing and intervention measures

taken in cases involving genetic diseases and defects. In this part the currency of genetic engineering will be explored.

3.2 THE MEANING OF UTILITY

The term "Utility" is the capacity of being useful (Edwards, 1967). Being useful can be understood as a means to something or an end of something. Phrasing it in another way it should be understood as means to something else. This is the idea of being a method. The end of something is the result or consequence. That is, the purpose or end of something. The capacity of being useful is the ability or potentiality as a means to enable the realization of some desired goal. That is the fulfilment of a given aim.

Jeremy Bentham (in Singer 1994:307) States "By utility is meant that property in any object whereby it tends to produce benefit, advantage, pleasure, good or happiness, (all this in the present case comes to the same thing) or what comes again to the same thing) to prevent the happening of mischief, pain, evil or unhappiness to the party whose interest is considered; if that party be the community in general, then the happiness of the community; if a particular individual, then the happiness of that individual."

It can be argued that if utility is potency it can be evaluated only after being actualised, that is, empirically or by speculating on its possible effects. That is, rationally positing of the possible consequences of an act.

It is instructive at this point to recall the desirability of upholding and using the pragmatic ethical framework of analysis. This is because genetic engineering is a clinical phenomenon whose analysis should be based on empirical data. It is the analysis of the consequences that arises or will possibly arise from the application of genetic engineering that are vital in declaring it as having utility.

The talk about possible utility, which is only rationally comprehended, is not a contradiction. In genetic engineering. the concept of utility entails the benefits that will accrue on human beings. The benefits are extrapolated from the data accumulated from animal and computer simulated experimentations. Therefore this talk of utility is from empirical grounds. Utility can be intelligibly understood and analysed as an a posteriori concept without necessarily having first to apply the technology to man. When used to mean the method used or the consequence expected the term utility as such is an aposteriori concept.

3.3 THE MORAL SIGNIFICANCE OF UTILITY

The concept of utility is morally significant. It elicits how useful something is and in this way justifies its pursuit. The concept of usefulness indicate the way in which something ought to contribute to the moral good which is the objective reason and justification for genetic engineering's application.

The concept of utility is the foundation upon which the ethical theory of utilitarianism is constructed. As Beauchamp (1979:121) informs, utilitarianism has varied interpretations like 'the end justifies the means" or "we ought to promote the greatest good of the greatest number" or "what is, right is that which is most useful." In these formulations the

ındercutting intricate interrelationship between the 'end', 'means' and 'good' form the tructural edifice of utilitarian ethics. According to utilitarianism the concept of utility lemonstrate how something be it as a method or the consequences ought to contribute to the :ood of the greatest possible number of people.

'he term utilitarianisms refers to "the moral theory that there is one and only one basic rinciple in ethics, the principle of utility" (Beauchamp, 1979:123). The basic assertion of ıe principle of utility is that human beings ought to produce the "greatest possible balance f value over disvalue" for all persons affected (or the least possible balance of disvalue if nly evil results can be brought about) (Taylor in Mappes, 1981:19). What the principle of tility in the context of genetic engineering dictates is that for the latter to be morally efensible it ought to produce the greatest possible balance of value over disvalue for all ersons affected. That is, it ought to be beneficial by virtue of its utility either as a means or ıe consequences set to arise from it. When the concept of utility is formulated into a rinciple it is transformed into a tool for testing or measuring the morality of something. Vhen utility is a measure of good in utilitarian ethics, Taylor (in Mappes 1981: 19) writes ıus: "the basic concept of utilitarian ethics is, as it name indicates, the idea of utility: an act ›r something) is right if it is useful". Useful in which way, and in what sense and to whom? is appropriate to ask what is usefulness as " means" or as "ends" that genetic engineering :hnology promises to serve? I will address this question below but it is imperative to ‹plore further how the concept of utility, under the framework of utilitarianism is ıunciated and appropriated.

Utility as earlier indicated is the potency of being useful either as a means or as an end. For the utilitarian, something is good or right to be pursed if it is useful in bringing about a desirable or good end, "an end that has intrinsic value" (Mappes. 1981:22). The term "intrinsic value" is "the value something has as an end in itself and not as a means to some further end" (Beauchamp 1976:22). Intrinsic value is an inherent property.Genetic engineering as a method has the capacity of eliminating defective genes. This is its inherent value. Genetic engineering has an extrinsic value. These are its consequences. It is capable of bringing about quality life.

In order to analyse the moral significance of the utility of genetic engineering it is instructive to consider it first as a means. This will enable the enunciation of its moral defensibility as an alternative to the natural selection method.

There are certain things that are valued because of their consequences but people do not value them in themselves. These are seen as "means" to something else. Genetic engineering as a form of "technology is defined as denoting practical knowledge or the *modus operandi* level of construction" (Feibleman in Mitcham and Mackey, 1992:2). I propose that "Technology as skills," can only be morally analysed by positing its end results. That is, analysing its morality as an alternative means by paying attention to the consequences it brings about.

Genetic engineering technology when used as an alternative method in the process of human reproduction, will only have instrumental value. This means that genetic engineering will not be practised for its own sake but for the sake of something else set to arise from it. This may

in turn be valued not as an end in itself but as a means to some other ends. Through genetic engineering human beings will arrive at certain conditions of life that they would want to have and enjoy just for their own sake and this is the good health. Quality life entails good health.

There is a close connection between means and ends. If the end will be valued, the means would be valued too, that is, in placing a premium of value on the end, then indirectly it will translate to valuing the means. This prompts Mappes (1981:16) to declare, "If we did not value the ends, the means would lose its value too." In other words, if human beings will not value the consequences of genetic engineering (perhaps because they will be considered negative) then as a means to such ends, it will loose its value; if it loses the value as means then it will be morally indefensible. If genetic engineering will not gain value from itself as means but from something else, that is, the consequences, then its moral value will be entirely derivative. It is that which is the ultimate end and the goal of genetic engineering technology that can be said to be of intrinsic value – that which will be sought through this means for its own sake. Genetic engineering when used as a means to good health indicate that it will have an instrumental value. That is a value-derived from something else. Its value will be derived from quality life. This means that quality life will make genetic engineering morally defensible. In line with this analysis of intrinsic and instrumental value it is worthwhile to note that something can be intrinsically good but instrumentally bad or be both intrinsically and instrumentally bad.

"The basic principle of utilitarian ethic is that the right depends on the good" (Taylor in Mappes, 1996:20). This means that something is considered morally right only by

determining the intrinsic goodness or badness of the consequences. Something is right only when it is instrumentally good and its rightness consists in its instrumental goodness. This is the true measure of the morality of any means used to achieve something (Taylor in Mappes 1981:34). The norm of evaluating the instrumental goodness of genetic engineering entails its capacity to contribute to quality life. Quality life entails concepts like "pleasure," "happiness" or "good".

In this way the moral norms of genetic engineering can be stated thus: it is morally right if it will bring about pleasure or "happiness" or "good" and "morally wrong" if it will bring about "pain", "unhappiness" or "intrinsic evil." These consequences should be seen in the light of quality life. That is, how the quality of life will be enhanced or not is the issue of concern in the moral analysis of genetic engineering.

In any human act, it is instructive to consider the intention. Intention is a moral norm. The concept of utility and intention are related to the "principle of beneficence" (Beauchamp, 1979). The basic aim or intention of genetic engineering is to benefit human beings to achieve quality life. The principle of utility supports the principle of beneficence, which is the hallmark of biomedical ethics. This means that genetic engineering is founded on the principle of beneficence via the principle of utility. It means that the utility of genetic engineering has the capacity to contribute to the desirable ideal standard of life. This is a moral ideal. Genetic engineering has a variety of benefits. Therefore it is worthy of human pursuits as it can contribute to "happiness", "pleasure" or "good".

How is utility an important concept in determining the moral good of genetic engineering? More so how relevant is the concept of utility in moral epistemology? Utility is a moral good that enables something to be known and declared morally acceptable. It is on the basis of that utility that the moral epistemology (that is, how a moral agent come to know something as morally good or bad) of genetic engineering is founded. That is, human beings come to know something is morally good if they repeatedly and consistently experience its utility. Consequently if genetic engineering possesses any utility, then through that utility they come to know that it is morally good. In this way genetic engineering will be known as a useful means leading to a morally desirable good. Utility as such will be the defining characteristic guiding the moral epistemology of genetic engineering. Utility of genetic engineering will therefore serve as a morally acceptable means to a moral good.

3.4 THE CURRENCY OF GENETIC ENGINEERING

McDonagh (2000: 36) poses the question thus "why is genetic engineering being so much worshiped and looked after as a saviour? Why are people seeking affiliations to genetic engineering as if it is all that matters?"

There are various reasons that explain why genetic engineering has of late gained so much currency. It is said thus: "genetic engineering has become an issue of 1990s" (Pence 1995:408). As an artificial selection method it is viewed as quick, perfect, effective and controllably predictable. It is certain and founded on the power of man's modern science. The currency is further propounded by evolutionary science. Charles Darwin's natural selection which is to be replaced by genetic engineering as the artificial selection method, is accused of being slow as portrayed thus: "nature has had three billion year to experiment

with genetic selection ... humans who have been present for less than one million year are now acquiring the ability to select the genetic traits of their own species" (Bishop in Mappes, (1996:546)". Natural selection is weak because it "cannot prevent the appearance of some individuals of inferior fitness" (Reich (ed)1978: 726).

Genetic engineering has been viewed as a conscious effort at quality control of the "pool bank of human genetic material which is undergoing a slow but inexorable decline in quality due to various reasons like dysgenic influences" (Burns (1983:421). Genetic engineering is proposed as a solution to rectify the defects occasioned by the continued use of conventional medical and health care. This continued use of conventional and health care results in maintaining people with genetically related diseases and disorders. Every successful techniques that lengthens the life span of persons with inherited defects increases the likelihood that such individuals will reproduce and pass on their defective genes to the genetic load of future generations. "Conventional medicine is now seen by the biological revolutionaries as one of the greatest threat to the human race" (Burns 1983:426).

Thirdly, the currency is found in the declining religious faith and the increasing faith in science (Singer 1994). Science expresses man's sincerity and intelligence in becoming an "architect" of his own evolution. Genetic engineering is a show of man taking first steps towards becoming a master of his own destiny. This existential claim of man's capacity of becoming a master of his own destiny raises the question "whether man can succeed equally well in directing the evolution of their own species toward goals regarded as good and desirable" (Reich (ed) 1978:726).

The fourth basis of the currency is the benefits set to arise from genetic engineering. It has the ability of opening a floodgate of opportunity of new choices. Genetic engineering will have two broad applications in the process of human reproduction. First it will be used in the "presymptomatic testing and screening" (Pence, 1995:384) "prediction, diagnosis and treatment of diseases that have a genetic component" (Mappes, 1996:481; Clark, 2000:14; Burns, 1983: 423). This application is a sure means of prevention, control and elimination of genetic diseases and defects.

The second way in which genetic engineering will be applied is in the character trait selection and enhancement. That is to enhance human capacities for example memory. Genetic engineering will be used in supplying a specific characteristic that the individuals might want for themselves (somatic cell engineering) or for their children (germ line-engineering), which would not involve the treatment of a disease. The most obvious example at the moment would be the insertion of growth hormone gene hoping that this would make the child grow larger.

In reference to the use of genetic engineering as a method to enhance capacities, the Council for Responsible Genetic (In Mappes, 1996:541) writes "some people may look forward to (the possibility of) introducing genes into the germ line that can enhance certain characteristics desired by parents or their custodians of the resulting offspring; germ line alteration could be perceived to meet future 'needs' to design individuals better at computers, better as musicians, better physically." It is hoped that the selected traits will enhance the quality of life of the offspring. If they will indeed enhance it, then the selection of character trait will be morally defensible.

Noting the benefits of genetic engineering in agriculture and citing a widely reported case of the introduction of an extra gene that specified growth hormone production to the mice that grew to double their normal size, the Council for Responsible genetics declares "the main selling point for germ line modification techniques over the long term would appear to be the prospects of enhancement of desired traits" (Mappes, 1996:541).

The case cited above demonstrates that other than the medical utility of genetic engineering, it has the potential of enabling character trait selection, physical and psychological enhancement of future generations. The potential benefits of these consequencies ensure enjoyment of life. It is safe to conclude that the currency of genetic engineering is founded on the concept of utility. This utility is the promise and the foundation of a quality life. By virtue of being a new prospect full of promise, human beings are willing to venture into it. Singer (1994) would contend with me that genetic engineering just like Copernican theory will triumph not because it is better than the natural selection but because it is a fresh approach to the quest for quality life and "full of promise"(Kuhn 1972).

3.5 THE MORAL DEFENCE OF USING GENETIC ENGINEERING

Are the prevention, diagnosis, controlling and elimination of genetic diseases and disorder by use of genetic engineering pose consequences that are morally precarious?

In order to develop a moral defence of using genetic engineering, it is important to start by briefly illustrating what is the prevalence and severity of some genetic diseases and disorders by citing documented data. Pence (1995: 385) informs that 'there are over three thousand five hundred "established" and two thousand five hundred "suspected" hereditary disorders,

and yet it is possible that most of us actually have heterozygous or homozygous genes for inherited disorders'. According to Pence (1995), by 1995 about twenty to twenty five thousand Americans had Huntington's disease (HD) a devastating and fatal neurological disorder for which there is no cure and no treatment. Breast Cancer, a hereditary disease and linked to a single gene kills fifty thousand American women each year, and it is estimated that at least one in ten women who are alive today will develop breast cancer by the age of eighty. The inherited form of breast cancer accounts for only about five percent of all cases, "but when the prevalence figures are as high as these, five percent itself represents a very high number" (Pence, 1995:409).

The lethal consequences of defective gene types and *Karyotypes* are still fairly considerable (Burns, 1983: 427). In determining causes of deaths of 1,014 children over a seven year period in the hospital of Newcastle in Great Britain, Roberts found "gene and chromosome defects to be responsible for forty two percent of the deaths in their sample. Single gene defects accounted for eight and a half percent of these childhood deaths, chromosomes aberrations two and a half percent, and those probably resulting from complex genetic causes thirty one percent. It is estimated that some type of chromosomes abnormality is present in almost half percent of live born infants and occurs in nearly one fourth of all spontaneously aborted foetuses. *Polyploidy* or *aneuploidy* has been found in almost two out of three such foetuses. Sex chromosomes anomalies occur with frequencies of up to two per one thousand live births and that such aberrations as *aneuploidy* (*trisomy* in particular) and even *polyploidy* are surprisingly frequent. More over, each person carries several deleterious or lethal genes, and roughly eleven million, three hundred thousand mutations occur in each human generation where almost none are neutral or advantageous" (Burns, 1983:422).

Mappes (1996) shows that the frequency of traits of sickle cell anaemia, a well known autosomal recessive disease characterized by acute attacks of abdominal pain and exhibits a range of severity is estimated at ten to twelve percent among the blacks in America. Typical of *autosomal* recessive diseases, there is twenty five percent or one chance in four that if two carriers of the sickle-cell traits procreate then the offspring will be afflicted with the disease. There is one chance in two or fifty percent that the person carrying the defective gene of Huntington's disease, an example of autosomal dominant disease, will pass it onto each of his children. There is a fifty percent possibility for a girl child to inherit carrier status like her mother of haemophilia disease unlike the male child who has an equal chance of being haemophiliac.

The above data on the severity and frequency of genetic diseases and disorder demonstrates that there is need for concerted efforts to be directed at prevention, control and elimination. It should be understood that genetic diseases and disorders are a privation from the normal health. Genetic diseases other than being a financial drain to the victims afflicted directly or indirectly, cause physical, emotional and psychological pain, stress, stigmatisation, loss of self-esteem and dignity. These consequences brought about by genetic diseases and defects are the anti-thesis of man's tireless quest for the realization of a quality life. Genetic engineering aims at assisting man to this end. Opposing genetic engineering is being irrational and inconsiderate.

It is the ability to eliminate such conditions, restore someone's health, save on economic and social costs, prolong life and ensure its quality as worthy of being human that the moral

necessity and justification of genetic engineering as an alternative method to natural selection takes its roots. Such benefits and the assured enjoyment of life and the derived pleasures from normal health all morally count as the utility upon which to declare genetic engineering as worthwhile. This is well corroborated by the contention that the basic intention of medicine is "not only that we treat persons autonomously and not harm then but also that we contribute to the health and welfare of the concerned" (Beauchamp, 1978: 135). It is on the unique capacity of genetic engineering to curtail the evils of genetic diseases and defects that its moral defence gains momentum.

In this chapter I have discussed what is meant by the concept of utility in relation to genetic engineering. It was established that the term has a two-fold meaning. First, it elicits the idea of the usefulness of genetic engineering as an alternative means of controlling the human reproduction process. That is because genetic engineering technology is set to replace natural selection method. Secondly it elicits the idea of the usefulness of the consequences of genetic engineering. This led to the analysis of the moral defensibility of the consequences of genetic engineering. The findings are that the quest of quality life is morally defensible. The findings show that the utility of genetic engineering is to contribute to and enhance quality life. Enhancing quality life being the ideal of living is a moral good. This is morally relevant as it is the yardstick used in assessing the moral defensibility of germ cell genetic engineering.

Why genetic engineering is so fashionable today is that after comparing it to natural selection method it is quick, predictable, efficient, effective and controllable unlike the later which is slow inefficient, unpredictable and uncertain. There are other reasons that explain genetic

engineering's currency. The decline in religious faith and the corollary rising faith in science and technology. This is leading to existential beliefs. The man's power and capacity to control himself using science and technology. The empirical factors like gene pool deterioration. The dysgenic influences like pollution and the quest for quality life combine into one force that gives the perception that genetic engineering is the only last recourse at hand to save humanity from the terror of defective genes.

The vindication of utility of genetic engineering is based on the data extrapolations from animal and computer simulated experimentations. This should convince the sceptics that it is possible to regard medical ethics as an experience-based field. This necessitated the use of pragmatic-empirical ethical framework in the analysis and support of the claim of utility of genetic engineering. This is where the data on prevalence of genetic diseases was highlighted to support the argument.

The nagging question is: if there is no serious moral objections against the application of genetic engineering and it has utility which is morally relevant, then hypothesising that it will affect the posterity, should it be applied? The answer is "yes". To ground the above answer, there is need to examine who are the future generations. What are their claims of rights and what are the present generation's duties and obligations in the circumstance of genetic risks? These are the issues to be discussed in the next chapter.

CHAPTER FOUR

POSTERITY, RIGHTS, OBLIGATIONS AND GENETIC ENGINEERING

4.1 INTRODUCTION

Pence (1996: 408) writes "genetic or germ cell therapy alters the hereditary genetic materials of an individual and thus affects only future generations, not the patient himself or herself; the patient's descendants will inherit altered genetic material". The Council for Responsible Genetics is more succinct in presenting the dilemma of the obligations to, and the claim of rights of the posterity when it writes, "Germ line modification is not needed in order to save the lives or alleviate suffering of existing people. Its target population are "future people" who have not yet been conceived" (Mappes, 1996:543).

In the continuing disquisition, it is imperative to examine a number of issues touching on the future generation. These are claims of rights, duties and obligations in relation to genetic engineering. First, the aim in this chapter is to investigate the future generation in respect to genetic engineering. Corollary to this, I will examine present generation's obligations and duties to the future generations. Lastly, I will examine the dictates of such obligations in the circumstances of genetic risks.

The relevance of this chapter is that it will ground the claims for being ethically obligated to the posterity in the context of genetic engineering. This forms the moral responsibility to direct genetic engineering to them. This will bear great relevance to the problem at hand of grounding the ethics that can guide the application of genetic engineering in the process of human evolution.

4.2 ARGUMENTS FOR THE RIGHTS OF THE FUTURE GENERATIONS

The potentiality of the future generation is to be actualised in the continuity of the procreation process. This realisation of the potency as guaranteed by the procreation process forms the structural basis for ascribing rights to the posterity and the correlative duties to them. Mary Warren (in Sikora and Barry (eds) 1978) supports the notion of potentiality when she argues that future generations are contingent beings nevertheless with potentials. Being potential is an "entity which is not now a person but which is capable of developing into a person given certain biologically and/or technologically possible conditions" (Warren in Sikora and Barry (Ed) 1978: 14). Genetic engineering technology promises to provide these biological conditions via the promotion and assurance of quality life.

The idea of potency is disputed by scholars like Martin Golding (in Sikora and Barry (eds) 1978) and Richard T. De George in Sterba (ed) (1988) who contend that since future generations do not currently exist, present generation do not owe them anything. Golding argues that since the interests and needs of the future generations, are unknown their basis of claims of rights cannot be known. Therefore we, as the current generation cannot have any moral responsibility in the form of obligations to them. This argument can be rebutted. This does not constitute a compelling reason why the interest of the future generations cannot be taken into considerations. This ignorance cannot constitute a good ground for the present generation's lack of obligation to the posterity. First it is weak and naïve to argue that the future generation will require radically different things to sustain themselves compared to the existing generation. For the last two thousand years ago man, has been depending on food, water and oxygen for his survival and all along striving for a quality life. Inductively human beings will always require these for their survival. How can the present generation

intelligibly think that in the next couple of years man will drastically change unless this is not sheer pretence? The desire for a quality life transcends spatial temporal horizons. A fulfilling life will be in order for the future generations. Not knowing the exact interests of the future generations, as Golding and De George put it does not justify not pursuing the application of genetic engineering. Since its benefits to future generations will be of a higher moral good, it should be applied.

There are various arguments offered to substantiate the rights of the posterity. First, rationality has been singled out as the only distinctive character that distinguishes man from all other things. Rationality, according to Schrender – Frechette (ed) (1993) is isolated as the only indispensable, powerful tool in man that is absent from all other creatures that can assist him in unravelling puzzling problems. The critical role of being moral, courtesy of rationality, is embodied in the words: "modern man must be a moral man, toward the future as well as the present, because the practical necessity and self interest of each make it desirable that we cultivate compassion and morality in us all"(Schrander – Frechette (ed) 1993:66).

In unison with other philosophers in praise of rationality notably Descartes, Leibnitz, Kant among others, it is important to note its powers in speculating, forecasting and hypothesizing about the future. Rationality will be vital in assisting men to think more about bettering the lives of posterity by first advocating for their rights to achieve quality life and ordering their actions accordingly. The vitality of reason in relation to genetic engineering cannot be over-emphasized. It will assist in deliberating about the good and the benefits that arise from genetic engineering.

The second argument that is appealed to when discussing the rights of posterity is historical and rooted in experience. According to Schrender – Frechette (Ed) (1993) men always retrospect on their past actions and assess how beneficial or lethal they have been and in that light they order their consequent actions accordingly. It is on the strength of this argument that the desire of exploring and developing an alternative to an action is given weight. This calls for caution, as our actions will be in future evaluated as how beneficial they were or have been. This argument reminds us as the existing generation, to consider that genetic engineering will not escape the a posteriori - ethical analysis (Kinitz, 2000).

The lesson from history is that man's various efforts to order his evolution towards a quality life has been frustrated by the inefficiency of natural method. The evidence of the moral strength of genetic engineering as an alternative is rooted in its suitability and effectiveness in bringing about the desired aim. But at this juncture it is instructive to send a cautionary note, that scientific knowledge can be abused. This calls for the society to participate in the controlling and guiding genetic engineering to curb possible misuse.

Being concerned with the rights of the future generations requires a radical shift in the realm of ethics. The past mistakes rooted in the pursuits of sanctity of life ethical framework are teaching mankind how defective the system is and as such the need for a replacement. (see the "empirical counter cases against the sanctity of life ethic" below)

This argument cements the need for prioritising on the future generation if the existing generation is ready to adopt a more responsive ethical framework (Anglin in Sikora and

Barry 1978). That is an ethics that encompasses other beings whether real or potential, human or non-human. Reason is a conclusively decisive and indispensable tool in defining how human beings ought to live.

The third argument as presented by Schrender Frechette (ed.) (1993) is that man has a duty not to jeopardize the welfare of contingent or unidentifiable persons in the future as this will usurp and prevent their potentials. This argument requires the recognition of the potential of future beings and in that light to defend their rights in order to enable the possibility of their actualisation. As such the present generation ought to ascribe and defend the right of future generations, as they are potential beings with a very high degree of potentiality. Whatever they do they must ensure the welfare of the potential beings. Genetic engineering is vital in this sense as it aims to ensure the quality of life of the future generation.

The above arguments point towards compelling reasons as to why present generation should be morally concerned and ascribe rights to the posterity. These rights will be the guiding principles in the application of genetic engineering. These rights ought to be embodied in ensuring quality of life. That is, these rights should be framed and enshrined in order to ensure that the future generation enjoys quality life.

4.3 OBLIGATIONS TO THE POSTERITY

There is need to examine in the face of genetic engineering whether the existing has obligation to the posterity. Secondly, it is important to examine the dictates o obligations to us who are the currently existing generation. Obligations are the moral basis that grounds and authenticates the claims of right. An obligation is defined as a rule, a law,

principle or an influence that morally forces one to do something. The possession of reason assists in demonstrating what man ought to do and why in respect to potential beings.

The nature and extent of the moral obligations has received extensive attention from scholars. Notably some like Golding in Monist 56 No 1 (1972) argue that obligations should be extended to the very near future generations while others like Robert Scotts in Sikora and Barry (eds.) (1978) argue that moral obligation extends to even the existing generations' remote successors. Others like Schwartz in Sikora and Barry (ed) (1978) ascribe obligations to future generations, irrespective of time. It should be noted that extending obligations to the future generations by virtue of their spatial temporal locations, leads to different version of obligation. This under utilitarianism is indefensible.

The idea that there are different versions of obligations to the future generations by virtue of their spatial temporal locations is untenable. This idea of different versions of obligations is wrong because first the assumption is that generations are discrete entities with such different and unique characteristics justifying directing to them different moral obligations. There is veracity in the claim that it is them who can know what is best for themselves and their immediate successors. But the empirical reality that humans have taken hundreds of years without any such marked difference in their pursuit for quality life or in their basic requirements for life, then it is justified to assume with such a high degree of probability that they will just be like the existing generation regardless of their spatial temporal locations. This is a good hypothesis to warrant current generation to not only guarantee the posterity the rights but to do so uniformly, irrespective of spatial temporal locations.

In pursuit of the utilitarian theory of obligation it is impossible to differentiate and accord different types of obligations to the posterity. Utilitarianism requires extending a uniform obligation. This dictates ordering the actions in such a way that they will lead to the greatest happiness of the greatest number of people. Utilitarianism dictates that regardless of spatial temporal locations of future generations the current generation's actions should contribute to their quality life.

The claims by opponents of genetic engineering and particularly the anti-prioritisation principle, that the current generation has obligations only to the existing generations can be shown on empirical grounds to be fatally defective. (See below "The environmental crisis) Take the example of being concerned with the existing people and directing to them the conventional medical and health care (Kavka in Sikora and Barry 1978). This allows the perpetuation of defective genes. This not only has had its enough share of negatively impacting on human health but it has ploughed back the same problems of defective genes to every generation. It allows perpetual perpetuation of defective genes by each generation. This proves difficult to eliminate some diseases. Medical intervention like vaccinations is intended actually to benefit the future generation. By vaccinating, the current generation prioritises on the future generation. It is in this way that genetic engineering aims at curtailing and controlling some genetic diseases. This is the manner in which prioritisation should be understood.

Borrowing a leaf from other fields where the concern has been for the only existing generation like in the use of natural resources the negative effects are the same which bespeaks of carelessness and lack of concern about the others who are not in existence. If during the industrial revolution, the then generation seriously thought about future

generations, the extensive damage to the environment that is being experienced today would have been an issue pre-occupying their minds. But this was not to be. The concern about their own well-being, as they were then existing, as if being in existence is all that matters – has lead to detrimental effects on the environment. It is the discrepancy in the defectiveness of this mentality of being concerned about only those in existence in respect to the environment that has led to the birth of environmental ethics. If such historical, empirical proofs demonstrate nothing with respect to genetic engineering and the posterity, then we are morally doomed.

There is need for concern about the others and not only those in existence in relation to prioritising on future generation (Warren, Anglin, Bennet and Kavka in Sikora and Barry 1978). This necessitates and justifies the need to prioritise on the welfare of the future generations. The point of concern here is that the people before us acted in a manner contradictory to the principles and dictates of utilitarianism. We, the current generation should not copy their mistakes.

Under the principle of obligation, it can forcefully be argued that the prioritisation dilemma can be resolved. There is a close connection between prioritising and acting. Failing to prioritise means failing to act in respect to a given course. It has been though that not acting is immune to moral scrutiny. Singer (1994) thinks otherwise. To act or not to act is morally equivalent. That is, unlike common belief, not acting is also morally praiseworthy or blameworthy. That is, acts of omissions are not morally neutral. Singer (1994) contends that there is an equal moral responsibility for those acts that someone has committed or omitted. Existential ethics give credence to this view when it states that " man ...once he finds

himself in this world, as a contingent matter of fact, and in the scene of human action , he is necessarily bound to choose freely. Even not to choose is necessarily to choose not to choose" (Kariuki, 1981:1).

In medical ethics, being faced with a case of a terminally ill person there are two courses of actions; an act of commission or an act of omission. Singer (1994) explicates the extent of the moral responsibility in both cases by way of a famous example. He examines the difference of the moral responsibility between actively killing someone by a lethal injection, an act of commission, or by letting someone to die by denying him food and/or medicine, a universally agreed act of omission. These acts are different but their consequences are the same. That is, the moral responsibility in both cases is equal and the same. Applying genetic engineering, which is to benefit future generations, is an act of prioritization. Not applying it is non-prioritising. These are acts of commission and omission respectively and both attract equal moral responsibility. This attests to the fact that the current generation has an obligation to posterity and therefore directing the utility of genetic engineering to them is morally praiseworthy. The greatest justification in directing genetic engineering to posterity is because of the higher good that will be served by the benefits resulting from its application.

An opponent of genetic engineering may think that it is safer to be morally responsible for an act of commission but not of omission and therefore opt not to direct genetic engineering to posterity. In such a case, that person is not in any safe a haven because of the knowledge (of the utility of genetic engineering), which is a moral determinant. Principally, knowledge will transform such an act of omission into an evil since that person deliberately ignored something he has knowledge about. In chapter two, I presented the case for genetic

engineering based on the knowledge of its utility. Therefore, having known the advantages of applying genetic engineering and opting to omit the benefit to those concerned by withholding the application will not make such an act any morally defensible but condemnable.

4.4 THE DICTATES OF OUR OBLIGATIONS IN THE CIRCUMSTANCES OF GENETIC RISKS

After examining the utilitarian foundations of the current generation's obligations to posterity, it is imperative to explore what such an obligation dictates in relation to genetic engineering and in the circumstances of genetic risks.

In this discussion, three cases of the dictates of obligation will be examined. These are the moral status of the germ cells, the morality of discarding the pre-embryos and aborting the foetus and the morality of freedom of procreation in the circumstances of genetic risks.

It was established that the utility of genetic engineering is based on the quest for quality life. I further examined the meaning and moral implication of quality life. For the sake of logical coherence and being systematic in this discussion, I will examine these issues in the reverse order starting with the morality of freedom of procreation, the morality of abortion and discarding the pre-embryo and lastly, the moral status of reproductive cells.

Right from the start the stand is that reproductive cells are morally neutral. It is not immoral to discard them. Also it is not immoral to discard the pre-implantation embryo. It is not

immoral to abort a genetically defective or diseased foetus. It is not immoral under individual moral responsibility to forfeit the freedom of procreation in the circumstance of genetic risks.

Procreating in the circumstances of genetic risks – particularly if one is at the risk of perpetuating defective genes to the off-spring is immoral. This is because there is an obligation founded on utilitarian ethics that dictates that we restrain from acting in such a way that may lead to the unhappiness of future generations. There is also an obligation to provide every possible child with "a normal opportunity for health" (Purdy in Mappes, 1981: 468; Fletcher in Mappes 1981:475; Lappe in Shannon 1976: 343; Fletcher in Shannon, 1976: 319; Kass in Shannon 1976: 295). Putting potential children at the risk of genetic diseases and defects is to abuse this obligation that requires providing every possible child with a normal opportunity for health. A normal opportunity for health is a guarantee to quality life. Procreating in circumstances of genetic risk is to perpetuate and increase genetic diseases. This violates the posterity's right to quality life. Knowing the negative effects of genetic diseases and defects imposes an obligation to protect the welfare of the posterity. Genetic engineering is morally defensible because it promises to compensate and correct the effects of procreating in circumstances of genetic risks. This is either through germ cell or somatic cell genetic engineering. Utilitarian obligation dictates doing that which is to the greatest general welfare and well being of the greatest number. This encompasses the present and the future generations.

The need to ensure good health to posterity dictates restraining the freedom of procreation in cases of genetic risks (Purdy in Mappes 1981: 470). This should be a moral obligation of every individual. In a liberal and democratic society people should not be coerced not to

procreate. Rather it should be inculcated in their morality. To most people. procreation regardless of one's genetic make up has been thought, albeit erroneously, as an "inalienable natural right" (Fletcher in Shannon, 1976: 324; Purdy in Mappes, 1981). But as the analysis of the foundations of "natural rights" (Finnis in Singer, (ed) 1994: 256) shows it is defective as it is founded on the claims of the absoluteness of the sanctity of human life. This ethic heaps rights as prior and paramount to human needs (Fletcher in Mappes, 1981; Singer, 1994; Fletcher in Shannon, 1976). As Kass and Fletcher (in Mappes 1981 and Shannon 1976) will contend, "rights are always imperfect and they are modified by human needs which have more profound basis". The need and desires for a quality life militate against such claims of inviolable rights to reproduce in circumstances of genetic risks. So, to claim that one has a right to procreate in total disregard of other factors like genetic risks is morally wrong. From a practical point of view, man should understand the uselessness of the immense social and economic costs that go into supporting the victims of genetic defects and diseases. Today's world requires a fundamental shift from the traditional view. A much higher morality is served when the freedom to procreate is seen as a privilege rather than a right. Society is sharing more and more of the costs of raising, educating and providing the recreational needs to the genetically defective. Unbridled freedom to breed serves neither freedom nor moral justice when it saps a nation's economy without purpose and when it pollutes and wastes the limited air, water, open space, and other resources that belong to everyone. "Above all, it cannot be condoned on any grounds in regularly committing inordinate numbers of people to destinies of squalor, disease, calamity and starvation" (Tullar 1984: 386). Such costs are unjustified especially now that the current generation have a choice to mitigate the effects of defective genes by use of genetic engineering. In the circumstance of making an alternative choice from natural selection method, man finds

himself with the moral responsibility of whatever course he chooses. The choice of opting for genetic engineering is morally defensible as it forestalls the negative consequences of defective genes to the individuals and to the nation or society in general. People ought to change their perception of the concept of right. This is where the right to breed is often viewed as a kind of biologic obligation to perpetuate one's family lineage. This is a wrong belief. It should be discarded.

The possibility of recanting one's rights to reproduce in circumstances of genetic risks is in conformity with the ideals of utilitarian ethics. No one would wish to give birth to diseased and defective children, as this would reduce their happiness. This is the very same way anyone normal would not have wished to be born defective or diseased genetically. Under a utilitarian ethical framework in circumstances of genetic risk, the obligation dictates the provision of "quality life." This is based on the "normal opportunity for health to every possible child. This overrides the unbridled right to reproduce" (Purdy in Mappes 1981). Acting under the obligation of ensuring quality life to future generations, it is not immoral to practice abortion. Is morality of abortion defensible in the circumstance of genetic risks when acting in accordance with the utilitarian obligation? Reason dictates that there is good that is set to arise from preventing the existence of possible children who are at actual risk of genetic diseases and defects (Purdy in Mappes, 1981; Singer, 1994; Pence, 1995; Fletcher and Kass in Shannon, 1976). The obligation of trying to provide the future generation with quality life (based on the denial of absolute claims of a right to life) shows that man has to act in such a way that he must ensure the coming into being of a happy future generation. Doing anything at his disposal to prevent anyone being born genetically defective is morally defensible.

Let me now turn the attention to the examination of the moral status of the germ cells. Man is in need of a moral norm that can assist him in determining the morality of the germ cells. Within pragmatic ethical framework, the empirical norm that can be adopted is the "level of sentience." Sentience is "the capacity to suffer or to experience enjoyment" (Singer 1979:58). The germ cells and the foetus have no capacity to experience either pain or enjoyment. They have no intelligible interest. Therefore their interest of not suffering or enjoying cannot be injured in any way. Since they do not suffer, there is no harm inflicted on them by either aborting or discarding them. Therefore it is not immoral to discard germ cell or to abort foetuses since they are not morally relevant. Even if it would be immoral to abort or to discard them, my conviction is that discarding germ cells and aborting genetically abnormal foetus would bring about a higher moral good. This is the assurance of quality life. This would vitiate the immorality of aborting and discarding genetically defective cells and foetuses.

There are claims by the opponents of genetic engineering that germ cells and foetus have the potential to become a person and they are injured when discarded or aborted. My considered reply is that if proved to be genetically defective or diseased the potential is not of leading a normal life but an abnormal life which will be lacking in quality. On the basis of the obligation of ensuring quality life one can terminate the realization of such a potential life. Another reason against the potentiality theory is that it leads to an absurd conclusion if followed to the letter. If one has an obligation to ensure the realization of the potential of each and every germ cell, and if one man's ejaculation contains over a hundred million sperms and a woman has over forty five thousand oocytes in her lifespan, then we should

make sure that all such cells come into contact with each other and fertilize to bring forth a child. If this is not absurd, it is strange. This is another case of *reductio ad absurdum* Consider also the absurdity that is always found in clinics and hospitals when trying to realize the potential of every possible being. Extremely defective and perpetually vegetative children who will never lead a normal life are kept alive – all in the name of actualising their potential. But this is more of the absurdity of acting within the sanctity and not quality of life ethic. It is also important at this stage to realise that the utilitarian obligation of ensuring quality life to every possible child would dictate a greater necessity and justification to discard the germ cells and the pre-embryo if genetically defective or diseased (Purdy in Mappes, 1981). This is because, acting otherwise, the consequences would violate the requirements of this obligation and knowingly contribute to the unhappiness of future generations, which is morally blameworthy.

The moral controversy about the moral status of the germ cells, abortion and procreation in the circumstances of genetic risks is fanned by the ignorance of the opponents of genetic engineering. Genetic engineering has the capacity to pre-empt these moral controversies. It has the power of "dissembling", "reorganising" and "creating" (Kinitz 2000:42) the DNA molecule to effect the required changes. The power of recombinant – DNA technology will not lead to the possibility of conceiving of genetically defective germ cells —courtesy of genetic screening. This in turn will pre-empt the possibility of discarding the pre-embryo or the need for aborting a foetus, and in the long run there will be no restriction of the freedom of procreation by the genetically defective couples.

In this chapter I have examined future generations and why they will exist. I have examined their claims of rights to the currently existing generation. Their only intelligible claim is that of quality life. I have showed why the future generations have claims on us and using the utilitarian ethical framework, I was able to examine the obligation to them. The dictates of the obligations in the circumstances of genetic risks were shown to be the quest for quality life. As such, I found out that it is morally not wrong to abstain from procreation, to abort a foetus or to discard genetically defective pre-implantation embryo or the germ cells. The reason for this conclusion is that no harm is done on reproductive cells or the foetus, as they do not have any sentience. This is also grounded on the obligation to ensure a normal opportunity for health to every possible child. That is a guarantee to do away with reproductive cells or foetus that may bring forth a genetically defective child. A normal opportunity for health is a guarantee for leading a quality life. Genetic engineering guarantees quality life to the future generation.

CHAPTER FIVE

SANCTITY VERSUS QUALITY OF LIFE ETHICS AND GENETIC ENGINEERING

5.1 INTRODUCTION

"As a nation we must choose between the sanctity of life ethic and the quality of life ethic" Ronald Reagan said in 1983 (Singer 1994:106).

As indicated in this quotation there are two broad frameworks of ethics namely that of quality-of-life and sanctity-of-life (Singer, 1994; McDonagh, 2000). Their orientation, practices, foundations, aims and dictates are different (Hughes, 2000).

Sanctity-of-life ethic, founded on the anthropocentric view of ethics professes an absolute right to life, calls for an absolute stand against taking away of human life as it is sacred and has an intrinsic value. That ethic (anthropocentric) places a very high premium on human life and not of any other creature. It "is unusual in its emphasis on the sanctity of every human life, but only of human life" (Singer, 1994: 165).

The quality of life ethic thrives, on the other hand, on the recognition that, in practice the value of human life varies. It is this variation that guides the way of making appropriate decision and the manner of acting in relation to a life (Singer, 1994: Mc Donagh, 2000).

Both of the above types of ethics bears heavily on the overall framework of biomedical ethics in which the ethical regulatory framework of the biotechnology of genetic engineering lies.

In this chapter, I will briefly examine the origin, nature and the guiding principles of anthropocentric ethics in which the sanctity of life ethic takes root. In order to expose the

weaknesses of the sanctity of life ethic. I will briefly present empirical counter cases against anthropocentric ethics. By revisiting the a *posteriori* ethical framework of analysis, I will advance the case against the sanctity of life ethic in the practice of genetic engineering.

In order to fill in the gap left by the dethronement of the sanctity of life ethic, I will advance an argument for the quality of life ethic in the practice of modern medicine and its appropriate suitability in the research, development and application of genetic engineering.

The significance of this chapter is that it will demonstrate the foundations of genetic engineering on quality of life ethic.

The relevance of this chapter to the whole disquisition is that it will propose, illuminate and advance the case for the quality of life as the appropriate ethic, that can be incorporated or used in the evaluation of the morality of genetic engineering.

5.2 THE FOUNDATIONS OF THE SANCTITY OF LIFE ETHIC

There is need to examine the foundations of sanctity of life ethic. By doing this, it is possible to expose the invalidity of the claim of sanctity of human life; this will show why and how genetic engineering conflict with the claim of sanctity of human life. The invalidity of the sanctity of human life is intended to show how and why genetic engineering is not harmful, as it does not injure it.

Gove *et al* (1972) defines anthropocentricism as that centering on man or considering man to be the central and most significant fact of the universe. It is the assumption that man is the measure of all things or interpreting the world in terms of human values and experiences.

There are three main philosophical traditions that will be considered in this section namely the classical Greek humanism, the rationalistic Cartesian dualism and the Judeo – Christian concept of the great chain of beings (Plato, 1965; Taylor, 1988; Singer, 1994). These traditions rest on very questionable assumptions. They simply beg the question:What makes human life sacred? These three views, which ground the anthropocentric view of ethics, lead man into seeing his own life as special, sacrosanct and sacred.

5.2.1 The Classical Greek Humanism

The sanctity of life is embedded in the inherent superiority of humans over other species. This is as explicated in the Greek definition of man as a rational animal. The animal nature was identified with 'brute' desire that need the order and restraint of reason to rule them. This is just as reason is the special virtue of those who rule in the ideal state (Plato, 1965). Rationality was then seen to be the key to the superiority of men over animal. Reason enables men to live on a higher plane and endows them with a nobility and worth that other non-humans lack. The Aristotelian view that "nature makes nothing without some end in view" (McDonagh 2000) was used to support the contention that the less rational were created to serve the interests of the more rational - non-humans and slaves, and human respectively.

This view does not provide an argument neither for human superiority nor for the sanctity of life. The Greeks held that humans in virtue of their rational capacities have a kind of worth greater than that of any non-rational being. In this case rationality's value lies in its importance for human life. These non-rational creatures achieve their species-specific good without the need of rationality. The humanistic outlook of classical Greek thought does not give a neutral (non-question begging) ground on which to construct an argument for the claimed sanctity of human life.

5.2.2 The Cartesian Dualism

The second philosophical doctrine underlying the anthropocentric view of ethics is that associated with the seventeenth century French Philosopher Rene Descartes who is regarded as the founder of modern philosophy (Singer 1994). Influenced by the new science of mechanics, Descartes held that all material things including animals are governed by mechanistic principles analogous to those governing a clock. He opined that man possessed a soul that differentiated him from animals and this is what is commonly referred to as Cartesian dualism of soul and body. He claimed that animals are mere "automata" or machines and lack the divine element that makes men spiritual beings (Holmes, 1984: Descartes, 1970). In this way, human beings belong to both the material world and the world of immortal souls which makes it possible for men "to be conscious and to have thoughts" (Singer, 1994: 168). Animals without an immortal soul cannot be conscious, as they are mere machines. Without consciousness animals when hurt may make sounds or noises but this doesn't mean that it is as a result of pain as they cannot feel it but it is just like the way a clock can make noises. Animal actions, Descartes contends, are more complex than those of a clock because they are more complex machines made by God unlike a clock made by man (Singer 1994).

The difficulties met in comprehending the Cartesian dualism are immense. It is instructive to note that Cartesian idea is metaphysical. Such metaphysical claims stops any further advancement of an ethical argument. They are indemonstrable claims always portraying ethics as an absolutist and a rigid discipline, which it is not. Ethics is practical and empirically founded. This fact Cartesian dualists and proponents of sanctity of life should appreciate to know.

5.2.3 The Judeo-Christian Concept of the Great Chain of beings

The third major foundation of the idea of sanctity of human life is the Judeo-Christian concept of the great chain of beings and the Hebrew's view of creation. (Singer, 1994; Holmes, 1984; Taylor in Pojman, 1985).

Humans are superior to animals and plants because their creator has given them a higher place on the "chain of beings." The chain begins with God at the top, and then moves to the angels, who are lower than God but higher than humans. The humans are positioned between the angles and the beasts, and then on down to the lower levels occupied by non-human animals, plants and finally inanimate objects. Humans, being "made in God's image" (Genesis 1: 26-27) are inherently superior to animals and plants by virtue of their being closer in their essential nature to God (Lanza and Taylor, 2000; Holmes, 1984). The metaphysical and epistemological problems of this conception of chain of beings are insuperable. It begs the question; what it is in a being that enables this ordering? Being created in God's image does not provide the ground for this ordering.

5.3 EMPIRICAL COUNTER CASES AGAINST THE SANCTITY OF LIFE ETHIC

Why is sanctity of life ethic anti-genetic engineering? Sanctity of life is being examined and condemned as it is unfairly opposed to the possibility of letting genetic engineering to be applied in the process of human reproduction. In other words, it is the inappropriate ethical framework in which genetic engineering application ought to be morally defended on. Sanctity of life doctrine "protects" spiritual and hence biological life from genetic engineering. This is wrong. The following counter cases show sanctity of life ethic as unfounded, inappropriate and misplaced. The claim of sanctity of human life should not hold us back from practicing genetic engineering. Claims of sanctity of human life should be discarded to pave way for genetic engineering application.

The anthropocentric view of ethics, which is an embodiment of the sanctity of life ethic, is currently under great siege; the weight of the challenge against it is unbearable. "Like cosmology before Copernicus, the traditional doctrine of the sanctity of human life is today in deep trouble" (Singer 1994: 188). It has been condemned as too rigid. unresponsive, unnecessarily protective, unfairly discriminative and constantly thriving on a serious fatal pretence always risking crumbling on its own weight as its very foundations are shaky, inconsistent and incoherent. In this tattered shape and in dire need to sustain itself in power, the sanctity of life ethics has been very hostile to its archrival, namely modern science and technology. Science has shred its edifice into pieces albeit a little bit late when great damage has already been done. It becomes self-defeating to deny the evils of the anthropocentric view of ethics in the face of the compelling reasons grounded in human experience.

The shredding of sanctity of life ethic call for an edifice that will recognise that ethics is an evolving discipline, which must be in constant review of itself in order to incorporate the emerging realities like genetic engineering.

5.3.1 The Copernican Revolution

The Copernican revolution is one of the empirical counter cases against the sanctity of human life.

Geocentricism is the theory that the earth is the centre of the universe and all other planets and heavenly bodies including the sun revolves around it (Edwards 1967). Nicholas Copernicus proposed to replace the geocentric with heliocentric theory in which the sun replaced the earth as being the centre of the universe.

The new theory despite its promising vigour, consistency and simplicity by virtue of contradicting the church's teaching which was a conformist view of the sanctity and the anthropocentric view of ethics risked being rejected (Singer 1994). Under geocentric theory, the centrality of man in his universe was believed to be a confirmation of the special nature of his life. The geocentric theory cemented the idea of sanctity of human life. The rejection of geocentricism implies the denial of sanctity of human life. Copernican revolution greatly undermined the claim of sanctity of human life. Copernican revolution rejected the religious domination and heralded the era of modern science. Modern science has little regard for claims of sanctity of human life. This is because these claims are indemonstrable, metaphysical and have no scientific relevance.

5.3.2 The Theory of Evolution

The second case to counter the foundations of the sanctity of life ethics is Charles Darwin's theory of evolution. As formulated in his two great works *"The origin of species"* and the *"Descent of man,"* Darwin in his theory undermined the foundation of sanctity of human life by teaching "that we too were animals and had a natural origin as the other animals did". (Singer 1994: 171). Basing his claim on scientific evidence of comparative embryology and physiology and the adaptive tendencies among living beings he reached the irrefutable conclusion that all species had a common origin. Therefore man is no different from other species. The consistent empirical data supporting Darwin's theory of evolution is immense. The theory too undermines the Judeo – Christian theory of creation and with this goes the claims of being created in God's image. Therefore the claim of sanctity of life is refuted.

5.3.3 The Environmental Crisis

The third case out of empirical data to necessitate the countering of the sanctity of life ethics is the predisposing factors that have led to the emergence of environmental ethics in the twentieth century (Pojman 1988; Singer (ed) 1994). For the first time in history, man realized the uncertain future that he had as a result of the wanton destruction of the environment. The damaging effects inflicted on the ecosystem – air, water, soil, animals and plants – by the development of science and technology is equally telling. It is these unfortunate circumstances that led to a dire need for a close re-examination of the attitude to the natural world (read non-human entities). At the level of this environmental crisis, the blame has squarely been placed on the nature of the sanctity of life ethical framework. It is from it that science and technology, the vessels of evil on the environment, emerge. Christianity as the pillar of sanctity and the anthropocentric view of ethics urge men to dominate, exploit and

lord over all creations and ultimately on the universe as a whole. White, a professor of history at University of California infuriated by the do-not-care attitude of the Christian religion, call Christianity "the most anthropocentric religion the world has ever seen" and call for a new kind of Christianity that would "depose man from his monarch over creation and set up a democracy of all God's creatures" (Singer 1994: 173). The emergence of the environmental ethics is therefore an anti-thesis of the traditional view of ethics where human life is regarded as sacrosanct and sacred.

5.3.4 Minority and Animal Rights Campaigns

The fourth case to confront the sanctity of life ethics is the call to an end of speciesm, and the discriminative tendencies like racism and slavery.

The repugnant and the seemingly unshakable edifice of sanctity of human life has been greatly undermined by the emergence of anti-speciesm calls in the name of animal rights advocacy and animal liberationists movements. Speciesm is, according to the Oxford English Dictionary, the discrimination against or exploitation of certain species by the human beings, based on the assumption of mankind's superiority. Animal rights activists and liberationist points out the analogue similarities of racism and specieism. They challenge the adoption of the idea of human equality based on some characteristics like equal value of life to be analogously equivalent to the very same principle being adopted in the case of segregation and discrimination against other species. The discrimination by human beings against other species alleging their own superiority is found wanting. The attack on specieism is based on the fact that nothing is in the *species homo* that makes it superior in any way over other species in this universe. (Refer to "the foundations of sanctity of life

ethic" above). They argued further that the idea of human equality still unfairly leave most sentient beings outside the moral realm. Animal liberationists challenge "If we are now able to see that the fact that a human being belonging to a different race is not a good reason for giving less consideration to the interest of that being, then why should the fact that a being belonging to a different specie be a good reason for doing so?" (Singer 1994: 174).

Animal liberationists viciously attack anthropocentric view of ethics as "a speciest morality" (Singer 1994). They advocate for giving of an equal consideration to the interests of all beings who have a minimum level of sentience. Belonging to different species is not an ethically justifiable reason for giving the interests of one being more consideration than another. This has had a profound impact on the way man ought to treat non-human beings, that is, plants and animals.

Why should we as human beings practice genetic engineering on plants and animals and not on ourselves if this is not speciesm, which is being condemned as rationally unjustified? If specieism is unfounded as racism is, then the sanctity of human life is equally unfounded. All species are equal.

5.3.5 The Behavioural Research on non-human Animals

The fifth counter case against the sanctity of human life is found in recent researches focussing on the behaviour of non-human animals and particularly so the primates. In an attempt to save the sanctity of life ethics from total collapse, man has claimed that it is only himself who is rational, uses language, makes and utilizes tools and who has "an autonomous sense of morality" (Kant, 1969) and therefore distinct from all other beings. These claims

have safely passed by without offering any concrete defence to the anthropocentric view of ethics when one considers the immense behavioural knowledge of non-human animals and particularly the great apes. On the tool making and tool usage, the pioneering work on great apes by Jane Goodall and Dian Fossey (Singer, (Ed) 1994; Singer, 1994) have repeatedly broken down the barriers which man has erected between himself and other animals. Goodall and Fassey documented chimpanzees not only using sticks to fish for termite but also shaping them appropriately before the various tasks at hand (Singer 1994). Chimps have since then been seen making and using a variety of other tools. One has even used a stone to turn another stone into a sharp edged cutting tool. Capuchin monkeys, for instance, can shape bone fragments with a stone before using them as probes for cutting tools (McGrew, 1992; Sugiyama 1994).

On the unique capacity to use language as if it is only language that matters, despite the lack of vocal cords which are needed to produce sounds, chimpanzees have demonstrated to be efficient learners and users of American sign language. This proof has broken down the belief that human uniqueness lies in the capacity for language. Singer (1994: 175 – 176) writes, "Koko, a gorilla, has a vocabulary of over one thousand words and can understand a much larger number of words in spoken English as well. Chantek, an Orang-utan, has used signs to tell lies *(for those who may claim telling lies is uniquely human)* – although there have been attempts to suggest that what the apes are doing is not 'really' language but just a response to cues provided by human beings, the immense amount of data now accumulated including the data on apes signing to each other or to themselves, now makes this explanation unteanable".

In "*Rethinking life and death*", Singer (1994) provides the final straws for blowing out claims of rationality as the grounds of the distinctive superiority of man. He writes "it remains true that we reason better than the other social mammals, but the objectives to which we apply our reason are generally ones we share with them: to obtain food, to gain sexual partners, to rise in social status, to protect our family, and to defend our territory. Even the most basic moral principles by which we constrain our behaviour, like the rule of reciprocity, and the obligations we have to our kin, as well as constraints on our sexual behaviour, are things we share with other animals"(Singer, 1994:176). All these similarities points towards the fact that non-human animals and humans are the same. Therefore sanctity of life is not after all convincing.

5.3.6 Similarities between human and non-human morality

The claim that only human beings are in possession of morality has also been criticised and rendered as inadequate to be a justifying reason for thinking of themselves as superior to other animals. This is especially so when they are compared to their near relatives, the gorillas, chimpanzees and apes. Apes show common strains of sexual morality and virtues of cooperation just like the human beings. "This demonstrates beyond any reasonable doubt that morality is not a special field for human beings" (Singer, (ed) 1994:57).

It can be argued that man's refined morality distinct from though related to animals provides a strong case for showing similarities of origin, aims and practice of ethics between human and non-human animals. Therefore recourse to morality as a barrier of the supposedly superior status of human beings over other non-human animals fails to withhold and serves no constructive purpose.

5.3.7 Genetic Taxonomy

The recent ways of classification based on genetics is another strong case against the constrained view of the sanctity of human life. Scientists' recent ways of classifying humans and their nearest ancestors in the light of the emerging knowledge of genetics proves to be the last undoing of the traditional anthropocentric view of ethics. The accurate ways of measuring the genetic differences between various animals in the field of molecular biology has led to the rejection of the many years of assumed belief that humans evolved as a separate branch from all the other great apes. This new knowledge is having "its implications for the way scientists classify humans and our nearest ancestors" (Singer, 1994: 177). In the strength of the emerging evidence from molecular biology, it is being proved that the differences between man and the great apes is not that of kind but of degrees.

This is a decisive evidence, that the existing two hundred year old method of categorization of beings has no sound scientific basis. It has been tailored to separate man from other animals and thus retaining him in the privileged status. This is no more explicit than when one considers that " we share 98.4 percent of our DNA with chimpanzees" (Singer 1994: 177). Genetic taxonomy tears down the claim of the sanctity of human life and the corresponding claim of superiority over other non-human animals.

5.3.8 The Emergence of Phenomenology

The enunciation of the phenomenological method has also had its impact on the sanctity of human life. Edmund Husserls' theory of phenomenology when incorporated in the ontological study of being as was done in Europe after the second half of the nineteenth century leads me to greatly detest the idea of human being that they are created by God. The

study of being as such in the circumstance of pure factual existence gives no idea of God. Fletcher in his article "Indicators of human hood: A tentative profile of man" (in Shannon 1976), informs that man despite being religious is not as such by nature. Fletcher writes, "Faith in supernatural realities and attempts to be in direct association with them are choices some human beings make and others do not. Mystique is not essential to being truly a person. Like sexuality, it may arguably be of the fullness of humanness but it is not of the essence. This negative proposition is required by our basic guideline, the premise that a viable biomedical ethics is humanistic, whatever reasons we may have for putting human well being at the centre of concern." (Shannon, 1976: 324). This phenomenological approach to the study of ethics shows that human being is a pure facticity, that is, he is just in existence. Kariuki (1981: 1) informs that, "Freedom is the meaning of human existence. It is a pure factual necessity.' That is to say, the human reality is not able not to experience freedom. For the human existence is necessarily a consciousness of freedom. However, human freedom is a contingent fact. In other words, the truism that man is free means simply that nothing external to the human consciousness can necessarily determine the human reality to perform any particular act. For the human consciousness is the ultimate determinant, that is, absolute norm of free action. This means that man is free; in other words, he is freedom. However, man cannot choose himself as freedom. He is condemned to be free. This is because he did not originally create himself. That is to say, man did not bring himself into this world."

Under existential ethics man realizes himself as a project through the experience and exercising of his freedom. There is no guide that man can rely on in his ordering of actions. The concept of God as the origin or order lacks meaning. This is what makes Sartre (1963)

to say that God is dead. Existential ethics effectively debunks out the idea of God as the creator of human beings and with it the idea of sanctity of human life is eroded. Emergence of phenomenology and the debunking of the idea of sanctity of human life show that man is free and responsible in opting for genetic engineering.

The counter cases against the sanctity of human life shows that it cannot hold back the current generation from applying genetic engineering. That is sanctity of human life is a vague, empty concept to appeal against genetic engineering. Having discussed the counter cases against the sanctity of human life let me examine the weaknesses of sanctity of life ethic in the practice of modern medicine.

5.4 THE CASE AGAINST THE SANCTITY OF LIFE IN MEDICAL ETHICS

Why is sanctity of life doctrine wrong, misplaced and inappropriate in medical ethics? How does it hinder the possibility of applying genetic engineering? What are the shortcomings that the sanctity of life ethic has brought about in the course of medical practice? How incompatible is sanctity of life and genetic engineering?

Recent advances precipitated by science and technology in modern medicine has profound impact on the practice of medical ethic. This has unfortunately led to so much pressure on the need to reform, overhaul and recast the medical ethics founded on the concept of sanctity-of-human life.

The doctrine of the sanctity of human life has been found wanting in various aspects. Let me examine how it has failed in the practise of modern medical ethics and now more particularly

why I consider it as a hindrance to the possibility of morally accepting genetic engineering in the process of human reproduction.

As earlier argued the doctrine of the sanctity of human life is an a priori metaphysical concept. It grounds some claims of absolutes that have been shown by experience to be wrong. Being metaphysical is intended to mean that the phrase 'sanctity of life' is not grounded on any experience. It assumes that each and every of human life is intrinsically valuable. When this idea of intrinsic value is incorporated in medical practise it leads to an absolutist "traditional medical ethic that never asks whether the patient's life is worthwhile, for the notion of a worthless life is alien to the principle of the sanctity of human life" (Singer, 1994: 57).

The sanctity of life in the context of medical ethics is vague, empty, useless and unhelpful when one is faced with a situation requiring a decision to be made regarding the normality or ideal value of life. Sanctity of life doctrine cannot assist in the deliberation about life and death issues in modern medicine, which is concerned about the quality and not the sanctity of life of a given person. When man is led by such a vague phrase leading him nowhere, the consequences are best described as absurdities, contradictions and hypocrisies. Peter Singer (1994: 57) captures the scenario of being faithful to the sanctity of life thus: "we all like the notion of the intrinsic worth of human life. We accept such a noble idea without much critical scrutiny; as long as it does not restrict us from doing what we really think is important. Then one day we find it is making us do things that are manifestly pointless, or likely to lead to disaster. So we take a better look at the fine phrases we so readily accepted. And start to wonder why we ever believed them in the first place. Then we drop them".

There are ample examples to illustrate the above remarks as witnessed on a daily basis: the caring of anencephalics, maintaining- by use of modern technology like respirators- of vegetative persons decrepit of any possibility of regaining or gaining consciousness, caring of greatly immature babies in the incubators maintaining those on the verge of death from terminal illnesses. Comparing the above cases with an ideal quality life they prompt one always to ask, "Could we really believe that every human life is intrinsically valuable?" (Singer 1994:57). This scenario is courtesy of the claim that everybody has a right to life irrespective of the quality, which is a reformulation of the absoluteness of the sanctity of life doctrine. The absoluteness of the sanctity of life ethics shows such things as "right to life" and "procreation" as intrinsic, eternal, objective, inviolable, pre existent phenomenon. They are not contingent on biological or social relativities and the prevailing needs. The obvious facts contradict this notion for example the absolute claim of right to life is nullified by capital punishment and abortion, which are rationally defensible.

Sanctity of life concept in its universal and absolute declaration does not recognise that the value of human life varies. For example a normal child and an anencephalic one, their value of life obviously varies.

The sanctity of human life targets the spiritual life; a non-existent and a useless concept in the practice of medicine. The idea of the sanctity of life, being a religious concept, as such, values life in spiritual terms. Its incorporation in the practice of medical ethics leads to a contradiction and appears hypocritical. To me the provision of medical and health care services by the religious – affiliated organizations or any one who is a believer in the sanctity of life is an incongruous scenario. If, for example, the churches that sponsor provision of

medical and health care services are honest, they could have realized that they are pursuing quality of life and not sanctity of life. No wonder that is why for those who are at the mercy of ignorance and hypocrisy of the sanctity-of-life ethic, are at ease and peace praying for someone on the hospital bed – why should not prayers alone do? Why combine medicine and prayers?

In the present-day pluralist world dominated by science and technology, any continued belief in the sanctity of life is untenable. This is because the sanctity of life being a religious concept cannot be universalised to the whole world. There is need for a universal medical ethic that is applicable irrespective of the beliefs of particular people. This will be founded on the concept of quality of life. The quest for quality life is natural to man irrespective of human conventions.

This is because it transcends all races, beliefs and cultures. Furthermore the present-day world being reduced to a global village, there is need for a universally coherent and applicable type of medical ethics.

Any strict examination and analysis of the co-variants of the principles of biomedical ethics for example the principle of autonomy, principle of non-malficence, principle of beneficence and the principle of justice and virtues, integrity, ideals and professionalism. the morality and the guiding ethical theories, none has an element or relation to the sanctity of human life but quality of life. To talk about the sanctity of life in medical ethics is an absurdity. Perhaps this is what prompts Joseph Fletcher, after denying that man is a worshipper, to declare; "this negative proposition is required by our basic guidelines, the premise that a viable biomedical ethics is humanistic, whatever reason one may have for putting human well being at the

centre of concern" (Fletcher in Shannon, 1976: 324). Humanistic is that which is related to basic existential fact of human reality. Humanism is a system of beliefs that concentrate on common human needs like quality life and seeks ways of solving human problems by use of reason rather than on faith in God.

The basic repercussion of the sanctity of life ethics is that it portrays science and technology as injurious to biologic human life as it ""tinkers" with it. This view has greatly hindered research, development and application of genetic engineering (see chapter two on Reply to Religious Objection). This is aptly demonstrated by the claim that technology dehumanises and degrades human persons. The logical import from this claim is that in order to curtail dehumanisation and degradation, the option is to stop further advancement OF science and technology. But Joseph Fletcher (in Shannon 1976: 323) on this regard says, "men are characterized by technique, and for a human being to oppose technology is "self hatred". We are often confused on this score, attitudinally. A "test-tube baby," for example, although conceived and gestated *ex corpo,* would nonetheless be humanly reproduced and of human value. A baby made artificially, by deliberate and careful contrivance, would be more human than one resulting from sexual roulette - the reproductive mode of sub-human species." The sanctity of life ethics does not recognise that man is not non – or anti – artificial. In this way, that which will result from genetic engineering will not be less human as the doctrine of sanctity of human life would like to portray.

The non-recognition of varying value of life, which is one of the unsuitability of the sanctity of life in modern ethics, is portrayed in the uproar over abortion issue. The acceptance of abortion is one source of pressure on the structure of sanctity-of-life ethic. Abortion involves

not absolutes of life *perse* as the sanctity of life ethic would lead us to believe but involves the empirical decisions about matters of degree. Abortion is founded on "what kind of life and under what kind of conditions" (Singer 1994: 91). Abortion has been legalized in many liberal countries like America and the Netherlands. An illustrative example where sanctity of life ethic recognises no variance of value of life is like in a case of a boy called Andrew, who was born alive, but so premature that his survival was doubtful and if he survived, there was a high risk that his prematurity would result in brain damage and some form of disability. Andrew's parents asked that no heroic measure be taken to save his life, but Andrew's doctor threatened to take them to court if they did not consent to the procedures they advised. Andrew was placed on a respirator "and continued to be treated even after it became clear that, if he survived at all he would be brain – damaged" (Singer, 1994: 83 – 84). The idea implicit in the acceptance of prenatal diagnosis and abortion is the willingness to make the quality of life judgements. That is, the judgement that life with a particular kind of disability is not as desirable as the life of a normal child. This is an expression of the "priority of quality of life over sanctity of life, at least as far as the foetus is concerned" (Singer, 1994: 93). The sanctity of life ethic require a basic acceptance that the value of life is in how useful it is to the person living it. This acceptance should be grounded on experience and not on a priori metaphysical claims. Genetic engineering and medicine in general and their ethics contemplate contributing to this relevant experience of quality life. The relevance of any ethic will recognise this undeniable fact of human existence.

5.5 The case for quality of life in medical ethics

Having established the weaknesses of the "Sanctity of life", let me now examine and defend the concept of "quality of life" in medical ethics.

I consider the quality of life as the practice aiming at ensuring that the value or worth of biological human life is enhanced or increased. This leads to consequences that lead to the enhancement of other relevant factors of human life. It originates from the recognition that there are factors that are negatively affecting the quality of the ideal characteristics expected of human life. These negative factors are therefore in need of being consciously counteracted. From this recognition, it is the moral responsibility of the individual, society and the medical fraternity to ensure that their actions are aimed at promoting these ideal qualities and characteristics that make human life worthy of being lived. The quality of life concept is responsible and has a direct bearing on psychological, economic, social, physical and mental well being of an individual. These elements contribute to a person's happiness.

In the practice of ethics guided by the notion of quality of life, "there is the recognition that the quality of human life varies" (Singer 1994: 190) On the basis of this recognition, paramount decisions concerning the life of a person are made under quality of life ethic. Biological life precedes the spiritual life. Without a healthy biological life the possibility of the spiritual life is hard to comprehend. The recognition of the variance of the quality of life enables the uniformity of application of medical principles since the goal of human life universally is to lead quality life. This is further reinforced by the non-absolutist stance of the quality of life. This eliminates the incoherencies, contradictions, absurdities and hypocrisies as those marking the practice of medicine under the principle of the sanctity of life. In other words, since the quality of life is empirically founded on clinical cases, it is practical and pragmatic. Being practical and pragmatic are the essential features of any human endeavour (Kinitz 2000).

Diseases and defects affect the quality value of life. It is the efforts to restore this value that research, development and application of medicine and medical technology has been possible. It also enables taking of appropriate decisions responsive of each particular case involving genetic diseases and defects. For example, it is on the basis of the quality of life that clinical decisions about an anencephalic child and a normal child are possible with regard to the extent of medical care intervention. The quest for a fulfilling life is the drive for the adoption of quality life in the modern world just as it has been from time immemorial. Man's basic aim of living is to enjoy a prolonged healthy and happy life. Genetic engineering promises to contribute to the self-awareness, capacity to relate with others fruitfully, save on economic costs and enhance physical qualities. As such, basic goals promised by genetic engineering are to ensure, increase and enhance the characteristics that can make human life more enjoyable. These include the prolongation of life, control and elimination of diseases and defects arising from genetic defects and enhancing those characteristics that can promote man's life. Viewed in this context genetic engineering is best suited to be pursued under the quality of life ethic. The quality of life ethics is the basis of development of science and technology, and recognises man as a technically oriented being in his endeavour to survive. Therefore reforming and prioritising on the primacy of the concept of quality life but not sanctity of life in modern medical ethics is the surest way in which human beings can see and analyse the ethical foundations of genetic engineering.

In this chapter I have analysed the basis of the anthropocentric view of ethics. The findings are that it has no morally defensible grounds. It is founded on shaky, logically inconsistent and question begging premises. Further, it was established that it is calculated to sustain the

supposedly superior status of human life over all of other beings. At the centre of the anthropocentric view of ethics is the claim concerning the sanctity of human life. Being a religious idea, it is metaphysical and a priori. But it is vague, unhelpful, logically unconvincing and question begging when placed under an empirical perspective. It often leads to absurdities and contradictions.

It has been shown how sanctity of life has formed a barrier against the moral acceptability of scientific and technological advances especially germ cell genetic engineering in medicine. I have proposed "quality of life" ethic to replace it as it is more promising, consistent, honest and pragmatic. It has been shown that the possibility of seeing genetic engineering as morally permissible and justified is only in the framework of "quality-of-life" ethic. This is contrary to the 'sanctity of life' ethic which is overly religious. It is therefore my conviction that any attempt of analysing the moral foundation of genetic engineering must be based on 'quality of life' and not "sanctity of life" which will block it and run contrary to the basic ideals of human existence and endeavours.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

There are two ethical frameworks of analysis that can be used in the analysis of genetic engineering. On the one hand is sanctity of life and on the other is the quality of life ethic.

The aim of this study is a critical examination of the type and suitability of the ethical framework that can provide the foundation of the moral defence of genetic engineering application in the process of human reproduction. The concern was prompted by the desire to resolve the controversy surrounding the morality of germ cell genetic engineering. The point of departure was that the various perspectives used in the analysis of the morality of germ cell genetic engineering are responsible for the persistence of this controversy. From the fact that ethics is an empirical and pragmatic enterprise, this necessitated the use of a posteriori ethical framework of analysis. This to the best of my conviction is the only framework full of promise in resolving the moral controversy surrounding germ cell genetic engineering. Quality of life concept has a high affinity to a posteriori ethical framework. Genetic engineering by aiming at quality life therefore means it ought to be analysed under this framework of ethics. Quality of life is an a posteriori concept.

By adopting the a posteriori ethical framework it was hoped that the problem of the multi-perspectives of analysis will be resolved. This use of multiperspectives was leading to a variety of contradictory conclusions which further lessens the possibility of reaching at a consensual idea about the morality of genetic engineering.

At this stage, the aim of this chapter is to asses the extent to which the findings are consistent with the research premise (hypothesis) of this study and as well as to evaluate the contributions that the study has made.

6.2 RECAPITULATIONS

Having stated the aim of this study there is need to integrate the objectives and the findings and relate them to the hypothesis. This integration will show the extent to which the research premise is true and in tandem with the findings.

In chapter two the objective was to reply to the objections levelled against genetic engineering. The guiding conceptual framework enabled the division of the objections into two groups. Those that are metaphysical and hence resolvable under the a priori-ethical framework. There are those objections that are based on empirical pragmatic grounds, and hence can be addressed through the use of consequentialist ethical theory. This was necessary because in the practice of medicine, which is an empirical practice, right and wrong is derived from consequences. Within this framework it was established that none of the compelling objections can be termed as insoluble when addressed pragmatically through public policy. Pragmatic public policy is an integration of the consequential utilitarian principles and a participative society under a radical, liberal and democratic political framework.

Four starting points for defending the application of germ cell genetic engineering were explicated. These four ethical starting points when combined with those factors that were stated as necessitating and justifying the application of genetic engineering - gene pool

deterioration, failure of natural selection method and knowledge of the benefit of the technology – and it was established that the technology is morally defensible. Genetic engineering has morally compelling benefits that if well pursued will contribute to, and enhance a higher good by ensuring the quality of life. From this conclusion. then, the principle of quality of life forms the foundation for supporting genetic engineering. Further the principle of quality life offers compelling reasons as to why human beings should reject the objections levelled against it and instead seek it.

In the third chapter the objective was to examine the meaning and the moral significance of the utility of genetic engineering. From the discussion, it was established the two ways in which one can understand the concept of utility. One way is by considering it as a useful alternative means instead of natural selection method that can be used to control human reproduction. The second way entails the usefulness of the consequences set to arise from the application of genetic engineering. Both of these two ways of conceptualising genetic engineering are underlined by the principle of utility, which means the capacity of being useful. Being useful in this disquisition is understood and used to mean the capacity of contributing to quality life. It was established that as an alternative means, genetic engineering is more laudable than the natural selection process that it is set to replace. This is because it is fast, efficient, predictable, controllable and effective. These qualities bear directly and heavily on human nature. This is unlike natural selection, which is slow, ineffective, inefficient, unpredictable, random and hence uncontrollable.

Regarding the usefulness of the consequences that one envisages to be resulting from the application, it was established that it will be possible among other things to predict, control

and correct genetic diseases and defects, enhance man's biological survival capacities. These noble consequences are the basis of fulfilling the principle of quality life.

The moral significance of the utility of germcell genetic engineering lies in how effective as means utility is and in how useful as consequences utility is. Therefore utility as effectiveness as means and usefulness as consequences are the grounds of the moral defensibility of genetic engineering. The intricate relationship between the means and ends shows that if the ends pursued are morally worthwhile and the means used are defensible genetic engineering or whatever else is in question is morally defensible as worthwhile. Using genetic engineering to achieve quality life is a morally defensible goal.

In the fourth chapter the objective was to examine the nature of the claims of rights of posterity and the extent of current generation's obligations with regard to genetic engineering. This objective is relevant considering that genetic engineering is directed to future generation who are "not yet conceived." The conviction that the future generations have rights and these rights are grounded on quality life, was reached through the analysis of their high probability of coming into existence. Reason, and the continuous nature of the procreation process directly shows that there is such a high probability of the future generations coming into being. The conceptual framework of utilitarianism obligates us, as the current generation to ensure that future generations benefit from our actions. One way of doing this in the context of genetic risks is to contribute to their happiness by controlling genetic disease and defects .This will enhance the future generation's capacities of enjoyment by use of genetic engineering.

Corollary to the rights of the future generation is the question of the current generation's obligations. Without obligations rights are empty rhetoric. For the sake of logical coherence, such obligations are founded on utilitarian grounds. Utilitarianism dictates that man ought to do good and ensure that good always. The suitability of utilitarian obligations is that it dictates the current generation to contribute to the happiness of the greatest possible number. The greatest possible number includes future generation.

What does the utilitarian obligation dictate to the current generation in the circumstances of genetic risk? This question is prompted by the conflicting nature of the obligations under the principle of quality of life and the ideals best pursued under the sanctity of life ethic. Crucial in resolving this dilemma is the principle that everybody has an overriding obligation to ensure a normal opportunity for health to every possible child. Through the dictates of this obligation of guaranteeing every possible child a normal opportunity for health, it was established that it permits aborting genetically diseased and defective foetuses. This is further cemented by Singer's (1979) morally relevant principle of sentience, which allows doing as one wishes with an object provided that he does not injure its interests or harm it in any way. Foetus and germ cells have no sentience, as such one cannot harm them by discarding them if genetically defective or diseased. This doing away with them is justified as no one wishes to bring into existence a child with an abnormal opportunity for health as the above obligation and the dictates of utilitarianism requires man to do. Concerning the right to procreate in circumstances of genetic risks, it was established that in consequential ethical framework, such rights are qualified by needs. As such needs supersede rights. The need for quality life supersedes the right to procreate.

The negative consequences set to arise by upholding and respecting such rights do not serve any morally worthwhile good. These rights to procreate ought to be forfeited. This forfeiture should not be through coercion. In a liberal and democratic society this would be morally indefensible. Instead through the recognition and appreciation of the good set to arise from one's act of restraining from procreation in circumstances of genetic risk, the forfeiture should be through exercising one's self-moral responsibility. That is, forfeiting the right to procreate should be an individual responsibility through an autonomous will of the self and not by coercion. This forfeiture of the freedom to procreate will serve a higher good. Uniquely the problems of discarding the germ cell, aborting and refraining from procreation are to be ameliorated by genetic engineering intervention. That is genetic engineering has the capacity to "correct" the genes of the cells themselves.

The greatest noble aim is to achieve a quality life for ourselves and for the offspring and for the offspring of our offspring and so forth to infinity. This unbound quest for quality life is attestable in the possibility of application of genetic engineering. The respective praise and the condemnation that is directed to acts with regard to their contribution to happiness or suffering confirm the moral responsibility that is attached to the obligations in ensuring the quality of life. For example, in assessing the moral praiseworthy of nuclear technology one ought to evaluate its contributions to quality life. So in this line of thinking, genetic engineering is ethically founded on the principle of quality life. If man has an obligation to pursue quality life, then it is morally justified to appropriate genetic engineering. Therefore the obligation to pursue quality life entails and morally justifies the practising of genetic engineering.

In the fifth chapter the objective was to enunciate and defend the quality of life instead of sanctity of life as the appropriate ethical framework within which to asses the moral defensibility of genetic engineering. In that analysis it was established that the sanctity of life in the practice of medical ethics is misplaced. This is because medical ethics is consequentialist (a posteriori) and the sanctity of life is non-consequentialist (apriori). This mismatch is the centre of the controversy surrounding genetic engineering since there is no way an a posteriori (consequentialist) issue can be approached through a priori (non conseqentialist) way without seriously threatening its logical consistency. With this in mind, I analysed the foundations of the sanctity of life and established that these foundations are logically incoherent and inconsistent. The factors that are currently threatening the sanctity of life ethic were examined. At the centre, the strain is concentrated on its hypocrisy, contradictions and the absurdities to which it always leads.

Having noted the misplaced foundations and the weaknesses of sanctity of life, the case for the quality of life was presented. The strength of the principle of quality of life is in the fact that it is a consequentialist term, practical and defensible under a posteriori ethical framework. In this way it is compatible to medical practice. As such, it bypasses the problems that the sanctity-of-life ethic is bedevilled with. With its ability to deal meritoriously with clinical cases, based on empirical grounds and within a host of practical precedents, the quality- of-life ethic avoids contradictions, the absurdities and logical incoherencies that face the sanctity of life ethic. Quality of life as such thrives on the outright recognition of the fact that the value or worth of human life varies. This variance is dependent on and directly proportional to the envisaged quality of life. This recognition

enables the appropriate handling of a case on merit and consequently the appropriate prescription of medical and health care intervention measures.

Genetic engineering with its roots on this basis of recognition of varying values of human life is appropriately placed to deal with the problem of human health and its goal of attaining ideal quality. The sanctity of life is a claim innocent of any helpful or morally significant content that can assist in the bettering of human's biological life. To claim that human life is sacred and sacrosanct in the practice of modern medicine is therefore incongruous. Sanctity and being sacrosanct are useless and vague concepts unless preceded by quality in life. That is one cannot intelligibly comprehend a sacred life without first having a quality biological life. This grounds the primacy of the quality of life, which is guaranteed by genetic engineering over sanctity of life. If medical ethics recognises and prioritises on the quality of life and not the sanctity of life then what this simply means is that it is only appropriate to analyse the ethical foundation of genetic engineering within the framework of quality-of-life ethic and not sanctity of life ethic. In this way the research premise or hypothesis has been proved true.

The aim of the research was to examine the appropriate ethical foundation of genetic engineering. The objectives have been directed to this end. First, the utility of genetic engineering is grounded on the promised quality life. Secondly objections were countered by the higher good that is set to arise from genetic engineering. This higher good is the quality of life. Thirdly, future generation have claims of right to a quality life. The corollary obligation and duty to ensure such quality life is vested on the current generation. Fourthly it was established that the medical practice is grounded on the quest for quality life. The

theoretical framework dictates to the current generation to ensure quality life to future generation. As such, genetic engineering has a high affinity to the quality of life as a utilitarian ideal. Therefore, genetic engineering ought to be evaluated on the basis of quality of life ethic. The appropriate question should be; what is the ethically relevant framework that can be used to evaluate germ cell genetic engineering? The appropriate answer should be; the ethically relevant framework that grounds and can be used to evaluate genetic engineering is "quality of life". Therefore the ultimate ethically relevant question concerning the foundation of germ cell genetic engineering should be: On what basis should the morality of genetic engineering be evaluated? It is on the basis of the germ cell genetic engineering's capacity to contribute to quality life that its morality should be evaluated.

6.3 The Contribution of the Research Study

The significance of this research study is that it has attempted to defend and justify germ cell genetic engineering in the process of human reproduction. It has attempted to delineate quality of life as the relevant ethical concept in pragmatic consequentialism as the way through which to analyse germ cell genetic engineering as ethically justified. It has attempted to clarify some morally relevant concepts like obligation, utility, quality and sanctity of life among others which bear heavily on the discussions and deliberations on the ethical defensibility of genetic engineering. It has ultimately enunciated and succeeded in defending the quality-of-life ethic as the morally significant foundation of analysing the morality of genetic engineering.

The relevance of this study is that it has shed light on an important issue about the quality of human life in an era dominated by schisms between religion and science and technology. It

has tried to defend how and why germ cell genetic engineering should be morally praised and not being condemned, by virtue of its capacity to contribute to quality life which is a moral and physical good.

I hope that these research findings will be of utility to policy makers, students and the general public when they are involved in deliberating about germ cell genetic engineering.

6.4 Recommendations

This study recommends:

1. A change of the present ethical attitude by re-orientating and educating the current generation about the empirical non-absoluteness of the worth of human life in order to open the possibility of a wider acceptance of germ cell genetic engineering as morally defensible.
2. The enactment of regional, national and international rules and regulations and the encouragement of more societal participation in the regulation of research, development and application of germ cell genetic engineering so as to control the possibility of misuse.
3. Further multi-disciplinary researches about the suitability of applying germ cell genetic engineering on humans due to its potential advantages.

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