Anthropological Paradigms and the Ethics of Genetic Engineering

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An honest man's the noblest work of God.
– Alexander Pope, *Essays on Man*

Introduction

Browsing along the first pages of the Bible, in the first chapter of the book of Genesis, we are introduced into the Judaeo-Christian belief of creation. It tells of how God created the world, including humanity itself. Genesis narrates: "Then God said, 'Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air..., and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth'. So God created humankind in his image, in the image of God he created them; male and female he created them" (Gen 1: 26-27, NRSV). The question of interpreting man as the imago dei has always been a discussion among religious faithful especially during the early epoch of the Patristic period. Various interpretations have come up trying to approximate its intentional meaning through modern biblical exegetical studies or in the light of contemporary trends in Christian Theologies.

The honesty of man to himself is crucial in the ethical assessment of human actions. The goals, means, the nature of the act itself, and the motives of certain human activities reflect how man reckons himself, how he views himself, his nature, purpose and ultimate end. The goal of this essay is to explore the ethical nuances of genetic engineering in the light of an anthropological interpretation of the imago dei. In no way does this intend to lay down a categorical ethical

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judgment on certain technologies of gene manipulation, much less to resolve the controversies that abound.

Likewise, it should be clear that this essay is not primarily or substantially an exercise of theological discussion and assessment, though there will always be theological allocutions. It aims to explore the theoretic framework that constitutes the backdrop of the ethic of genetic engineering, the backdrop which constitutes the context of our judgments in the concrete cases of technological application.

In toto, the overarching concern is to encourage reflection and research, theological or philosophical, in a number of technologies that scientific progress has contributed to a better understanding of man, the world and ultimately – our faith in God.

I. Genetic Engineering

Ethical theory or ethics has yet to cope with the great strides science and technology have accomplished for the last two decades. These issues cover more completely those involving humans as objects or goals of clinical experimentation or research. In the area of genetic research, it is not wrong to establish a presupposition that genetic engineering or manipulation has always been for the benefit of man. Researches involving the mass production of high quality crops and the special breeding and nurture of genetically manipulated animals are rampant in the agriculture and animal husbandry of First World countries.[1] Such strides in scientific experimentation and research are well on the go without much moral debate entailing. But, when the researches and experimentation center on the human person himself, a lot of ethical implications are disclosed.[2]

Every human activity constitutes a moral dimension. Though this datum has absolute extension, we less correctly understand it,

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[1] In the Philippines, though not one of the First World Countries, genetics has also helped greatly in the introduction of a new variety of crops that offer a higher yield and has become more resistant to certain diseases. Among them is the IR-8 variety of rice that gave a boost to the agricultural income of our country in the late 1960s and early 1970s. See Francisco G. Reyes, *Science and Technology in the Philippine Society* (Manila: University of Sto. Tomas Press, 1973), p.31.

[2] Cf. *Catechism of the Catholic Church*, nos. 2292-2295. Cf. also John Paul II, The Encyclical *Evangelium Vitae* (25 March 1995), nos. 39-43, 53-57.

and lesser are we apparently conscious of it. In the field of genetic engineering, nay all human activities, ethical evaluation builds on a triadic field of judgment: the intending agent, the intended patient and the intentional act. As the title of this essay suggests, the area of inquiry revolves around (but not only to) the ethical assessment of the intentional act itself: the various technologies of genetic engineering in the light of a certain set of anthropological paradigms.

The term "genetic engineering," a term which came to fashion in the late 1960s, refers to "the directed alteration of genetic material by intervention in genetic process."[3]

The biological component of every living organism is the cell. Each cell, in its nucleus, contains the genetic blueprint of that species. This genetic blueprint, more commonly called, in the case of humans, the human genome consists of 100,000 genes arranged in some three billion base pairs in the 23 pairs of chromosomes. These chromosomes are so-called DNA (deoxyribonucleic acid) molecules. Since 1952, scientists have known that these spiral-shaped molecules constitute "the basic stuff of heredity." DNA molecules are responsible for the production of proteins, the building blocks of life. It is the proper functioning of the DNA molecules that determines the genetic well-being of a living organism. A change in a gene, as in mutations (or errors in direct technological alteration) causes malfunction in the production of the needed proteins, hence explaining some genetic defects or illnesses like thalasemias, sickle-cell disease, cystic fibrosis, haemo-philia and color blindness to name a few. It is the hope of genetic engineers that their researches may soon find gene therapies to some, if not all, of these. Through the manipulation of these genes with the introduction via vector of in vitro recombined DNA (rDNA), scientists intend to stabilize whichever dysfunction of protein production might there be in a patient.

Over and above these, an attempt is being carried out to completely map and sequence the entire human genome. The Human Genome Project (or Initiative)[4] which began in the late 1980s aims at completely mapping and sequencing the human genome in some 15

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[3] Webster's *New Collegiate Dictionary*, 1983 ed., s.v. "genetic engineering."

[4] See Philip Elmer-Dewitt, "The Genetic Revolution," *TIME International* (January 1994) pp. 32-39.

years. This almost herculean undertaking is subsidized by the U.S. Federal Government with an estimated budget of $3 Billion at present. Recently, in December 1993, French nationals have announced that they had already roughly mapped the Human Genome. With this achievement, it is hoped that the Human Genome Project will speed up in their mapping. With the accomplishment, together with the specific locations of defective genes in genetic diseases, the introduction of a number of gene therapies follows. A number of diseases have been genetically located and various researches are being conducted for treatment.

There are four applications of genetic technologies applicable and used for humans.[5] They are: (1) Somatic gene-therapy; (2) Germ-line gene-therapy; (3) Enhancement genetic engineering; and (4) Eugenic genetic engineering.

1) Somatic gene-therapy

This genetic application is carried out by introducing a cloned normal gene specific to the defective gene or pair of genes into the appropriate somatic cells (cells other than the ova, sperm cells and their early precursors) of the impaired patient. This corrects the genetic defect of the patient by stabilizing the necessary protein production. There are four possible means of transferring the cloned normal gene into the specific cells: a) by using modified viruses as vectors, b) chemical means, c) fusion or genesplicing, and d) microinjection or electroporation.[6]

Somatic gene-therapy is already a reality and has met success in treating specific genetic disorders. However, this is in the case only of those gene cases with recessive conditions. Since genes come in pairs, recessive conditions are characterized by the dysfunction of both genes. Therapy is achieved by transferring a normal gene into the specified defective somatic cells to stimulate protein production. The first successful attempt on this gene technology was conducted on September of 1990 in Maryland, USA. The technology is used to treat a

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[5] James J. Walter, "Presuppositions to Moral Judgments on Human Genetic Manipulation," *Chicago Studies* 33:3 (November 1994) pp. 228-229.

[6] Luis Archer, "Genetic Engineering and Human Freedom," *Catholic Medical Quarterly* 4 1:1 (February 1990) p. 7.

case of ADA deficiency (adenosine deaminase deficiency), a specific blood disease with a recessive condition, which until then was incurable. Also, experimentations are underway, among others, for a cure of an equally incurable disease, cystic fibrosis.

Gene, which comes with a dominant condition on the other hand, is so far not yet feasible. This would entail the elimination of the defective gene in the gene pair. However, hopes are present especially with the great advances gene technology is being carried out.[7]

2) Germ-line gene-therapy

This gene therapy differs from the aforementioned in that it concerns precisely the germ-line cells. These refer to the ova or egg cells, the sperm cells and their precursors including cells of the early embryonic development. Somatic cell therapy is the treatment of the genetic disorder of a single person who, despite this treatment, can still carry the disease to his/her offsprings and the rest of his/her future generations. Germ-line genetherapy, differentiated from the other, refers to the total abolition of the defective gene in the person's genetic heritage, i.e., the genetic disorder will no longer be inherited by the offsprings.

At present, this gene technology is in active research with animals. The procedure is conducted by using "modified viruses or artificial pseudoviruses constructed by in vitro assembly of nucleic acids and proteins. The nucleic acids contain the gene to be introduced, flanked by DNA sequences so designed as to facilitate integration at the right locus, as a regulatory region for the appropriate control of the gene's expression."[8] The proteins of such vectors are technically designed as to appropriate itself to the specific target cells, i.e., the male germ-line cells.[9]

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[7] Aside from the recessive and dominant conditions, another genetic condition is multifactorial. This gene condition is actually the result of pairs of genes together with environmental factors. Heart disease and cancer are among the well-known examples of multifactorial conditions. See Agneta Sutton, "The New Genetics: Facts, Fictions and Fears," *The Linacre Quarterly* 62:3 (August 1995) pp. 77-78.

[8] Archer, p. 9.

[9] Luis Archer added another classification of genetic technology, Gene Therapy in Embryos which is in principle similar to germ-line cell therapy. It is the application or introduction of genes into the newly in vitro fertilized ovum. The gene was

It is expected that in the near future, such technique of gene-therapy will be available for the human germ-line cells. It is hoped that with this technology, the progeny of humans with specific gene disorders will be spared from inheriting the disease.

3) Enhancement Genetic Engineering

This sort of application moves beyond the boundaries set by the principles of Medicine per se, that is, it has nothing to do with the curative or therapeutic intentions. Through the on-going research and experimentation by the Human Genome Project, it is projected that possibilities of enhancing or improving certain human traits and characteristics might not be a far future. As the Project intends to schema or identify genes responsible for specific traits and physical characteristics, enhancement genetic engineering aims at a cosmetic goal of refurbishing the physiological make-up of an individual and his/her progeny. This may be achieved through somatic cell engineering, when the enhancement is limited only to a certain individual, or may involve the germ line cells as when the patient intends to pass the enhanced characteristics to his/her progeny.

This application refers to the concept of designer babies where parents choose the specific traits and characteristics of their children which, in the parents' own discretion, the children ought to have. Such may include an increased capacity for athletic or mathematical skills or certain physical features that would be on top of the society's prejudicial judgment of what is beautiful or what is not.

4) Eugenic Genetic Engineering

Gene technology also offers a wide possibility in the application of eugenic principles. Eugenics aims at the genetic manipulation for the improvement or betterment of human nature.[10] Pushed to the extremity of eugenists' arguments, it asserts to the creation of the homo novum, the new man, the establishment of the superior class

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expressed in the tested animals, and transmitted to their progeny. High risks of failure however made it impossible for the human embyonic cells. *Ibid.*

[10] "A science that deals with the improvement (as by control of human mating) of hereditary qualities of a race or breed." Websters Ninth New Collegiate Dictionary, 1983 ed., s.v. "eugenics."

in terms of race, culture and genetic make-up through improvement of human intellectual acumen and physical capabilities and stamina.

Eugenics takes on two forms: a positive eugenics and a negative eugenics. Positive eugenics promotes the marriages of people belonging to a purportedly superior class in order to expand their own genetic heritage. Negative eugenics, on the other hand, aims at ameliorating the spread of people belonging to the "lower class" by discouraging marriages or preventing them from having more babies or not allowing them to have children at all.

The principle of eugenics is already present even before what we may usually reckon. Although eugenics is a term coined in 1883 by the English scientist Francis Galton (1822-1911),[11] eugenic intention was already present, at least on record, in Plato's Republic, depicting a superior class of human beings through selective breeding. In the U.S., sterilization laws were enacted in more than half of its states through the efforts of the American Eugenics Society founded in 1926. The bitter attack against eugenics was directed at the German Nazis because the extermination of Jews, blacks and homosexuals was inspired by eugenic intentions.

Nonetheless, a renewed interest arose in the 1950s due to certain diseases transmitted genetically. Example is the genetic disease sickle cell anemia transmitted through the union of marital partners carrying the defective genes. More than the prohibition of such union is the extermination of fetuses identified as carriers through genetic screening.

Apart from the exercise of negative eugenics, Eugenic genetic engineering could also offer the technology to redefine the human genetic make-up. After the completion of the Human Genome Project, scientists would have identified certain genes responsible for increased intellectual and physical capabilities. As professor Archer said, "if gene technology is one day able to alter the human genetic make-up, direct interference with human evolution is then possible."[12]

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[11] Early in his first major work, Hereditary Genuis (1869), Galton has already expounded his contention that selective marriages between the rich and noble could produce a gifted race among their progeny. The New Encyclopaedia Britannica, 15th ed., s.v. "eugenics."

[12] Archer, p. 10.

II. Anthropological Paradigms

Any judgment is an informed judgment. Assent to truth or falsity regarding the ethical assessment of specific intentional acts moves within the periphery of a certain context. As James J. Walter demonstrated "any informed moral judgment about the genetic manipulation of the human genome is always shaped within a context."[13] Walter argues that this field of evaluation takes on the foryn of theological and anthropological presuppositions. Ethical assessment and mutual assent to these presuppositions are proportionate. When mutual assent is greater, the evaluation of technologies in genetic engineering is more positive and vice-versa.

Nonetheless, the purpose of this essay is not to recapitulate these theological and anthropological presuppositions. Rather, it is to use these presuppositions, specifically the anthropological, as paradigms or models to disclose the ethical nuances that constitute the backdrop of any informed judgment on concrete genetic technological application.

One of the anthropological presuppositions enunciated by James Walter was the religious view of humanity as created in the image of God, human as the *imago Dei*. This concept can be interpreted diadically: first, the imago dei as steward of God's creation and, second, the *imago Dei* as God's co-creator. There are various interpretations in defining the relationship of these two. There is the idea that they are inversely proportionate. If we assent to the interpretation of humanity as steward of creation, then we cannot tamper with it, redefining it according to our feeble standards. Much less should we tamper with our human nature which for some may mean precisely as the characteristically divine image of God in men and women. To affirm stewardship absolutely is to deny co-creatorship absolutely.

Another suggestion is the interpretation that stewardship is to be understood as co-creatorship. This idea reckons that "to be a responsible steward is to participate in the ongoing adventure of evolution through seeking to unleash the potential within nature, including human nature. To be a steward is to be an actor, a designer, a

[13] Walter, p. 229.

planner, a co-creator."[14] Though such an observation is clearly more "fruitful" than the former interpretation, somehow it proposes an ambiguous stand regarding the relationship of the two. Stewardship is seen as co-creatorship. This understanding undermines the contextual contribution of stewardship in ethical assessment. It superimposes the idea of co-creatorship to that of stewardship. Hence, now it appears that these anthropological presuppositions move along a dialectical line. They appear now as mutually exclusive, two sides of the same coin diametrically facing the opposite directions. Thomas A Shannon seems to suggest an either/or relationship of the two.[15]

Herein now lies the reason why the author prefers to understand these two not just as presuppositions but as models. They are paradigms that mutually correlate to disclose value-judgments in the ethical assessment of contemporary technologies in genetic engineering.

1) Humanity as Steward of Creation: Paradigm of Stewardship

The idea of stewardship in religious consciousness is a more traditional approach in human responsibility towards the rest of God's handiwork. This manner of interpreting the *imago Dei* assumes "that this stewardship was exercised by observing the limits inherent in the order of nature and society. The order of society was based on the order of nature and that order was established by God at creation. Thus both orders were divinely sanctioned and set the boundaries for acceptable behavior."[16] As these orders are consonant with the divine law of God, humanity's involvement do not include then the alteration of our genetic heritage as that constitutes, to a sizable extent, a divinely ordered workmanship. "Our principal moral duties," says Walter, "are to remain faithful to God's original creative will and to respect the laws that are both inherent in creation and function as limits to human intervention."[17]

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[14] Thomas A. Shannon, "Issues and Values in Genetic Engineering: A Survey," *Chicago Studies* 33:3 (November 1994) p. 261.

[15] Thomas A. Shannon, *What are They Saying About Genetic Engineering?* (Mahwah, New Jersey: The Paulist Press, 1985) p. 21.

[16] Ibid.

[17] Walter, p. 234.

Utilizing the concept of stewardship as a paradigm in assessing technologies in genetic engineering, the idea no longer offers a categorical limitation when creation is understood as a dynamic evolution. Precisely because it ensues some difficulties in the light of the doctrine of evolution, stewardship then appears *passe*, or relegated as an archaic perspective which moves human to passivity amidst the unfolding of contingent natural events in human and cosmic history. Stewardship as a paradigm redeems needed value-judgments necessary in accessing the ethical implications of genetic technology. Here, there are at least three value-judgments disclosed in analyzing the paradigmatic role of stewardship: (1) the need for diagnosis or genetic testing in view of therapeutic interventions in genetic diseases; (2) the moral imperative for therapy; and (3) the necessity of preventive measures in the transmission of diseases.

These three value-judgments are mutually related in the context of stewardship. As stewards of God's creation, our task revolves around maintaining and continuing its present state. Humanity's role is to preserve and conserve nature and creation in conformity with the objective natural law divinely enacted. However, certain irregularities and dysfunctions ensue as cosmic history unfolds. Humanity as stewards act to maintain the balance as they are capable of doing it. In the case of a concrete human being, certain physiological abnormalities as diseases are observed that needs to be treated, an act that even moves further, not only as a gesture of kindness or respect for God's creation, but as a moral imperative. Hence, a process or method of determination is necessitated in order to predict the possibility of a child or a young adult developing certain diseases (predictive testing), or the possibility of a person to transmit genetic diseases to his/her progeny (carrier testing), or the determination of the health of an unborn child (prenatal diagnosis).

The task of stewardship analogically is not limited only in a return to a prior state of stillness after ripples are produced from a thrown pebble. As steward, a person also makes sure that such ripples might not result again by protecting the pool from the curiosity of some wayfarers.

True enough, diagnosis and genetic testing, therapy and some preventive measures are values inherent in stewardship. In no way are they alien to the function of man as steward of God's creation. However, things are not that simple. Despite the inherence of the

aforementioned values, there are ethical nuances involved which might or in some cases, actually put at stake the basic rights of people. These nuances include the motive of application, the right to privacy and information, among others. Any application that would impinge freedom and curtail the exercise of basic rights, and violates the dignity of a person fall short of categorical acceptance in ethics. The value of therapy, for example, plays an eminent part in accessing the licitness of a certain application in the light of objective moral norm. However, the motive of therapy alone would not suffice especially when the risks that may incur far outweigh the benefits that a certain application can offer. Preventive measures in curtailing the spread of genetic diseases with eugenic intentions are not acceptable either. So are diagnosis and testing in view of inducing abortion whenever a certain genetic defect or malformation is present in a fetus, or the possibility of extermination in the presence of a likelihood of developing grave genetic disorder late in life of a new born baby. Indeed much of the ethical situation here is dependent on certain conditions.

Even the moral stance of prenatal diagnosis is conditional. The Congregation for the Doctrine of the Faith for instance says that "If prenatal diagnosis respects the life and integrity of the embryo and the human fetus and is directed towards its safeguarding or healing as an individual, then the answer is affirmative."[18]

The setback of a stewardship interpretation of the imago dei is the tendency to fall back into passivity or inactivity. A person just stares at nature, promenades amidst its beauty and whenever s/he encounters something out of place, picks it up and puts it wherever it should be. Creativity seems to be out of the question, just letting things be according to what they have been since creation. The paradigm which tries to respond to this setback is the interpretation of the imago dei as co-creator.

2) Humanity as co-creator: The Paradigm of Co-creatorship

Understanding humanity as co-creator is a more recent interpretation of the *imago Dei* in the light of the theory of evolution (not to be confused with evolutionism) and current studies in genetics. In

[18] Congregation for the Doctrine of the Faith, *Respect for Human Life in Origin and the Dignity of Procreation, Donum Vitae*, Febr. 22, 1987, art. 1, n. 2.

contrast with the concept of stewardship, it sees humanity as actively involved in the unfolding of events in cosmic history. This paradigm offers a dynamic conception of the human not solely as a determined creature but also as a codetermining co-creator, with God as the absolute creator. As Thomas A. Shannon reckons, "The model of co-creator assumes that nature is dynamic and changing and that the end of the process is open, but related to the absolute future of humanity. Responsibility is exercised in this model by shaping and directing the evolutionary process according to values and criteria perceived to be appropriate in the light of goals that will promote human and social goods."[19]

However, such an interpretation carries the weight of a number of objections that are based on certain biases toward genetic research and a naive understanding (or misunderstanding) of a certain dialectic between the theory of evolution and the belief on creation. Properly understood, this co-creatorship is not an entirely foreign dogma of cognitive understanding, even independent of any religious confession. James Walter succinctly put that "As created co-creators we are both utterly dependent on God for our existence and simultaneously responsible for creating the course of human history."[20] Karl Rahner, the great German Jesuit theologian of the 20th century, has enunciated that:

As far as a Christian understanding is concerned, man is not simply the product of 'nature', as if nature alone were able and authorized to determine and model man's being. Man is not only the being who is commissioned by God to further God's work of creation, the being who both may and must 'subdue the earth', i.e. his environment. Rather man is characteristically the being who has been handed over *to himself, consigned to his own free responsibility.... Freedom is the* inevitable necessity of selfdetermination, by which man [...] makes himself what and who he wants to be and ultimately will be in the abiding validity and eternity of his free decisions.[21]

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[19] Shannon, *What Are They Saying...*, p. 23.

[20] Walter, p. 234.

[21] Karl Rahner, "The Problem of Genetic Manipulation," *Theological Investigations*, vol. 9 (London: Darton, Longman & Todd Ltd., 1972), p. 227. See also "The Experiment with Man," *Ibid.*, pp. 205-224.

In Rahner's theological anthropology, a person is seen in his/her existential situation. For him, self-transcendence, which leads to or which characterizes human self perfection, is the free and responsible exercise of one's freedom situated within history. Humanity is dynamically and intrinsically involved in God's self-communication in history in the realization of the Kingdom of God. Placed within the broad context of Rahner's theology, genetic engineering could not simply be dismissed "as an unethical project."[22] The whole intentional framework of such a project is in consonance with Rahner's major tenets of theology. Even the revered moral theologian Bernard Haring did not easily dismiss the studies in genetics, on the contrary, he felt admiration. "Admiration," says he, "is my first response... to the findings of science in the field of genetics, where scientists have been able to decipher the language of the genes."[23] For the Swiss Ecumenical Theologian Hans Küng, genetic manipulation is legitimate but only" when it serves the protection, preservation and humanization of man."[24]

Utilizing the concept of co-creatorship as an anthropological paradigm in genetic engineering discloses at least two value-judgments: (1) it gives impetus for the realization of human potentialities, in this case potentials in science and technology; and (2) the manipulation, modification or alteration of nature including humanity itself. Over and above these value judgments is an overarching concern for per-fection. Precisely because nature is seen in the process of perfection, humanity is given an impetus, the motive of perfection, to co-determine the course of history on what human potentiality might suggest on good discernment. Such an idea is not totally different in the wider context of human historicity.

Despite studies that seem to disvalue the philosophy of George Wilhelm Friedrich Hegel (1770-1831)[25] he has clearly thematized the

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[22] Ibid., p. 227.

[23] Bernard Haring, *Ethics of Manipulation: Issues in Medicine, Behavior Control and Genetics* (New York: The Seabury Press, 1975), p. 159.

[24] Hans Kung, *Global Responsibility: In Search of a New World Ethic*, trans. by John Bowden (London: SCM Press Ltd., 1991), p. 32.

[25] Jurgen Habermas reckoned that early in the 1940s, Karl Popper has criticized Hegel as an antagonist of the open society. Cf. Jurgen Habermas, *Moral Consciousness and Communicative Action* (Cambridge: The Massachusetts Institute of Technology Press, 1990), p. 1.

contribution of some people who have "changed the course of history" and whose identity represents epochs in world history. This he called "World-Historical Individuals." They are extraordinary persons who have influenced their time with their avant-garde ideas, mostly suffering great afflictions and sometimes even costing them their lives, the Socrates of their epochs.[26] Such may correspond the term social or historical manipulation.

To be more specific, countless scientists have made great breakthroughs in medicine and technology furthering the tide of scientific revolution especially at the dawn of the 20th century. To cite Nobel laureates in the human and natural sciences is but a crude and minimal way of identifying men and women who, in their own respective fields, can be called World-Historical Individuals.

However, with the advance of genetics, the paradigm of co-creatorship in human genetic manipulation seems to some as an altogether different chapter of a single book. They are more than wary to consider that such technological intervention still falls within the ambit of co-creatorship. They prefer to play-safe in the cubbyhole of the paradigm of stewardship when, faithful to its intentionality and nature, we verifiably do more justice by placing it within the greater backdrop of the paradigm of co-creatorship. Such an obscure attitude results from fear that what is now at stake is humanity itself. One author began his article with these words: "Despite our reluctance to admit the truth of the matter, there is something a little frightening about the concept of genetic engineering."[27] Indeed, it is right that humans be cautious with what s/he can do (distinguished from what s/he ought to do) for such endeavor may either lead to his/her advancement towards perfection or self-destruction. Reasonable application of well-discerned judgment however is elementary.

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[26] Though of course the overarching peculiarity of Hegel's idea of "World Historical Individuals" is the latters inchoatively immediate conformity with the Spirit, the author's inclusion in this essay of Hegel's contribution to Philosophy is not to highlight the Hegelian Philosophy of the Spirit. Rather, it is to emphasize Hegel's primal affirmation of those distinguished men and women in the unfolding of history. Cf. F. H. Hornedo, "Theories of History and the Philosophy of Science," *Nature, Science and Values: Readings*, edited by Norberto Castillo, O.P., Ph.D. (Manila: The University of Santo Tomas Press, 1988), pp. 326-329.

[27] Joyce G. Bradshaw, "What's Wrong with Genetic Research?," *Social Justice Review* 86:9-10 (September-October 1995), p. 135.

The paradigm of co-creatorship approximates the ethic of gene technologies which may include germ-line gene-therapy, enhancement and eugenic genetic engineerings. There are not much qualms on the issue of somatic cell gene-therapy particularly if therapeutic motive per se may itself be a moral imperative vis-a-vis a reasonable judgment on its risks and benefits. This stance is upheld and supported by the paradigm of stewardship which includes, among its disclosed value-judgments, the therapeutic goals which science and technology can offer. However, the case of germ line gene-therapy, a therapeutic intervention into the human germ-line cells which affect not only the patient but which would include his/her progeny, will not hold in the still waters of the paradigm of stewardship. Inasmuch as it involves a therapeutic goal, critics fear that there is a possibility that it may ethically backslide into eugenics. Somatic cell therapy has gained general approval in some countries,[28] but not with the germ-line therapy. It has not always been easy to draw a categorical division between therapeutic and eugenic applications in medical science. What are the costs that might ensue from and benefits offered by germ-line gene-therapy" Seeing the diagram (see diagram A) provided for *prima facie* immediately makes one conclude rightly that the possibility of an ethical acceptance over the issue of germ-line cell therapy is slim and nil. However, as it has been reiterated often already, this is due to the technical inadequacies of the present state of technology that somehow casts a stark gloom of eugenics. If germ-line gene technology would already be able to face squarely its negative implications by addressing its deficiencies, then perhaps a general consensus might be achieved, like in the case of the somatic cell therapy.

Ian Barbour had given three conditions to approve of germ-line therapy. He said that extensive studies should be pursued in the area of somatic cell therapy in order to insure the positive prospects of good effects expressing themselves on the patient after genetic alteration has been conducted. This duration should extend over a long and considerable period of time to measure and register its indirect effects. Another, germ line therapeutic techniques should be continuously conducted on animals for a long and considerable period of time. This should include the succeeding generations of the genetically mani-

[28] In the U.S., for instance, the Office of Science and Technology Assessment has published a report, *Human Gene Therapy - Background Paper*, in December 1984 favoring Somatic cell gene-therapy.

pulated animal in order to measure and register both the direct and indirect effects of the techniques on the patient and its progeny. Lastly, Barbour said that a wide public approval should be sought since, when applied to humans, its effects will also extend to the patient's generations or progenies, the unconsented beneficiaries of the technology of today. Barbour reckoned that at present, these conditions have not been met yet, even closely. Nonetheless, perhaps after a long wait, this technology might become available for the human species.[29]

After a long discussion on the ethical nuances of germ-line gene therapy, what can we now say about enhancement and eugenic genetic engineerings. The issues on the last two genetic techniques that we have considered are almost insurmountable even with a perfect success of a concrete application. For one thing, the therapeutic goal is completely out. Properly speaking, these technologies are cosmetological than medical. As such, they fail to have a more solid ground for an acceptance in ethics compared with the first two. The hope for them may even be void. What are the bases for these statements which are almost a denunciation of human potentialities in the area of genetic engineering? As the paradigm of stewardship leads to a certain passivity or inactivity on the part of humanity, the pitfall of a paradigm of co-creatorship is that human tendency to "play God." Hence, the main locus of the problem is not technological but attitudinal. Even with the advance of technology, the issue confronted and questioned is the human attitudes, views, and ultimately beliefs. Technology would comprise a minute detail and the main bulk remains on the attitudinal level of human cognition.

The human being will always be an historical being, a being situated in time, conditioned by the culture of his/her time but always hoping to reach that level of perfection, fulfillment and realization with which his/her being has being divinely endowed. The diversity of world cultures is awesome that cultural biases will always abound. Our ideas of what is good, what makes one beautiful, which is perfect are culturally prejudicial especially when judgments are based on the superficial externality of things. What might be beautiful for me might not be beautiful for you. We cannot reduce humanity in the spiral strands of genes. All sciences in dialogue with other forms of

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[29] Ian Barbour, *Ethics in an Age of Technology*, vol. 2: *The Gifford Lectures 1989-1992* (London: SCM Press Ltd., 1992), p. 197.

discipline abhor reductionism. A reductionist mentality among scientists serves nobody. Physiological constituency is integral but does not define the entire human person in terms of behavior, emotions, psyche and intelligence. A person is a complex of factors interrelated with one another. There is no place for any form of biological reductionism with which every geneticist and ethicist should be wary of in the application and evaluation of certain concrete technological applications.

Perceived positively, these challenge ourselves, how we view nature and how we relate with nature consonant with our views. It is this pitfall that the paradigm of stewardship tries to respond in a positive way. The paradigm of stewardship reminds us that we are only co-creators, with limitations in the actualization of our God-given potentialities. We cannot usurp the divine prerogative reserved only to God, the supreme and perfect creator on whose being we only participate. Such is the interplay between the two paradigms, correlative and complementary.

Conclusion

After a brief and rudimentary exposition of certain gene technologies and after accessing the ethical nuances of certain technologies in genetic engineering in the light of the anthropological paradigms of stewardship and co-creatorship, we might ask: Is there a radical paradigm shift between the two? To affirm that there is is tantamount to an acceptance of a position that is more susceptible to the eugenic goals of technological intervention in science and medicine. We need to be wary in accessing stewardship as traditional and co-creatorship as modern apropos to the technological age that we are in now. Indeed these paradigms should be viewed vis-a-vis in the ethical assessment not only in genetic engineering but also other technological advances in science and industry. Indeed, each interpretation offers a conceptual framework in accessing genetic engineering, however, to understand them merely as presuppositions (which to some is understood as mutually exclusive) entails the loss of a dynamic and integral approach to ethical judgment. To posit a relation of paradigmatic synthesis would offer a more favorable suggestion that preserves each other's ethical framework but not falling to each one's logical pitfalls and limitations.

TABLE A

COSTS	BENEFITS
The price to be paid for any mishaps would be high, since these would be he reditary and transmitted froni one gen eration to the next.	Medical utility and necessity: GLGT offers a true cure or palliation for many genetic diseases, and sometimes the only effective way of addressing those diseases.
Germ-line therapy means treating or subjecting future generations to today's techniques which may seem crude and simple by tomorrows standards.	Prophylactic efficiency: by preventing the transmission of disease genes, GLGT would obviate the need to per forin costly, risky somatic cell gene would reduce abortions.
Some of the disease genes got rid of might carry information for other traits than the disease we wish to eliminate; some good traits might be lost in the process.[1]	Respect for the autonomy of patients and scientists: we should respond to the reasonable requests of prospective patients, and to the reasonable research of individual scientists and scientific community.[3]
By depleting our common gene-pool, we might genetically impoverish future generations.	
GLGT (Germ-line gene therapy) techniques would open the door to attempts to enhance human traits through germ-line intervention, which could exacerbate problems of social discrimination based on those traits.	
GLGT experiments would involve research with human embryos and effects upon their offspring, effectively placing them in the role of unconsenting re search subjects.	
GLGT techniques' would violate the rights of subsequent generations to in herit a genetic endowment that has not been intentionally modified and possibly cost valuable genetic diversity for the human race as a whole.[2]	

[1] Agneta Sutton, "The New Genetics: Facts, Fiction and Fears," *The Linacre Quarterly* 62:3 (August 1995). *passim.*

[2] Anthony Fisher, "The Human Genome Project: Hopes and Fears," in *Philippiniana Sacra* XXX, 90 (September-December 1995): 490.

[3] Ibid.