

SCIENCE AND TECHNOLOGY AT THE SERVICE OF HUMAN LIFE IN AFRICAN COMMUNITIES (In the light of recent unconfirmed report on cloning of humans by the Raelian Sect)

Fr stan chu ilo

“For Africans, human life is to be prized and not priced; indeed there is an understanding of life as a spiritual chain of growth and development that begins in the womb and continues after birth unto the tomb. In traditional African society, even miscarriage is seen as a curse and abortion is perceived as an unspeakable taboo that wounds the spiritual bond of the family and the community. To be pregnant is seen as to be in the hands of God, since the pregnant woman is seen as a messenger of God because of the sacral quality of the gift in her womb. Thus the preservation of human life from the womb to the tomb is an essentially demanding but rewarding responsibility. The appreciation of the giftedness of each of us is the first condition for both being authentically human and properly oriented to live in society or to participate in leadership.”

There has been a recent report in the Western media on the successful cloning of a human being by a sect called the Raelian movement. The claim of this society has not been independently confirmed. The Raelian movement is the founder of the Clonaid Company, which claims to have produced the first cloned baby. The movement claims to have about 40,000 members in several countries, although the number is difficult to verify.

The sect, which believes humans were created by extra-terrestrial beings who had mastered genetic engineering, was founded in France in 1973 by a former journalist who worked for a racing car magazine. One December morning in 1973, journalist Claude Vorilhon was on his way to work in the French provincial town of Clermont-Ferrand. But - according to a book written by Mr Vorilhon, who is now known as Rael - instead of going to the office, on an impulse, he drove to a nearby volcano. There, he says, he was contacted by an extra-terrestrial being that emerged from a flying saucer and told him - in fluent French - that people from another planet created humans in laboratories.

The creators were known as the **Elohim** - a word that, in ancient Hebrew, meant "those who came from the sky". Mr Vorilhon was told to spread the word of the **Elohim** on Earth in preparation for their return. He describes them as being little over a metre in height, with pale green skin, almond-shaped eyes and

long dark hair. Since then the Raelians have grown into an international movement. Rael himself has reportedly relocated to the United States after complaining of harassment by the French authorities.

The Raelians' interest in cloning seems to stem from their belief that the human soul perishes when the body dies. Therefore, they believe, the key to eternal life is not the soul but the recreation of individuals from their DNA. In 1997, the group founded Clonaid, which now says it has cloned a human being. In 1990, the Raelians changed their symbol, originally a Swastika inside a Star of David. The idea was to improve relations with Israel and persuade the government there to let them build an embassy for the Elohim in Jerusalem.

([Who Are The Raelians?](#), BBC News, Dec. 28, 2002) Faithful to his commission, Rael has established a movement to spread the message of the Elohim and to build an embassy to welcome the extra-terrestrials back to earth. The message in large part explains who the Elohim are and how life on Earth came to be. Also, it is important for the embassy to be built in order for the Elohim to return to earth and share their scientific expertise. It has been revealed that the Elohim "will only come when we build their embassy, such is their love and respect for us'.

A friend of mine, who spent a week in a Raelian Sensual Meditation camp in the Quebec countryside, came back with a mixed report of the experience, which sounded like a cross between a nudist camp and a New Age retreat. The rules were simple: Everybody was free to say not to a sexual invitation, nobody had the right to feel jealous or possessive if their lover desired another, and the wearing of condoms was mandatory. The place was filled with gay men, girls fresh off the plane from Japan, Swiss women walking around naked -- and far too many Quebecois studs for my friend's taste. Like the Rajneeshi before them, the Raelian Movement is essentially a lifestyle cult. ***In increasingly irreligious Catholic societies***, Rael's success seems to derive from offering a structured environment for decadent behaviour: He offers a no-guilt playground for hedonism and sexual experimentation.

Concerning the extraterrestrial being of Elohim, who is supposed to save us, Rael wrote in an **apocalyptic** style, "To die for Elohim, that is the most beautiful thing that this planet has to offer. It is the key to Allah's garden or to the planet of perpetuity."

The adherents of the UFO sect, which is active worldwide, believe that the cosmic super-being of Elohim will soon arrive with UFOs and liberate people who have the proper awareness from their earthly valley of sorrow. So it is no coincidence that the magazine in which Rael makes his revelations bears the name "Apocalypse" (Nr. 101). The title and the program are the same. The

Raelian movement is represented in 50 countries on all five continents and has been especially active in Zurich for several years. The UFO sect made headlines in Summer of 1997 because it announced that it would soon clone people. Whoever wants a duplicate of himself can order one for \$200,000.

The Swiss adherents have introduced themselves at the Federal Assembly and have already demanded diplomatic status for Elohim. Besides that they want the government to erect a UFO landing field and an ambassador's residence. Otto Stich, who was then a member of the Federal Assembly, responded by asking if Elohim, as a counter-gesture, would be willing to establish a Swiss embassy on his planet. Since then diplomatic news blackout has been in effect.

Brigitte Boisselier, the chemist who made the cloning announcement, is a Raelian herself -- a bishop, in fact. At the news conference she appeared to be wearing the Raelian silver medallion combining the Star of David and a snowflake, symbolizing infinite time and space. Cloning humans is at the heart of the Raelian theology of "scientific creation," which they describe as an alternative to both Darwinian evolution and creation dogma of the major religions. "Cloning is the key to eternal life," Rael says. During the 1990s, Quebec granted religious status to the Raelian movement. It is significant that Quebec is the only predominantly Catholic province in Canada, yet it is in her backyard that this strange group is mushrooming with a legal recognition. Its representatives have conducted condom distribution programs aimed at Canadian teenagers. They also have tried to persuade Roman Catholics to renounce their faith, prompting lawsuits. Clonaid, the first human cloning company, was founded in February 1997; right after Scottish scientists announced the birth of Dolly the sheep, the first mammal to have been cloned from an adult. Rael and a group of investors created Valiant Venture Ltd., a corporation based in the Bahamas, to run Clonaid, a project whose main goal is produce the first human clone.

Clonaid says on its Web site that after pressure from the Bahamian government - - which feared the experiments, might be conducted on one of its islands -- Valiant Ventures was dissolved. In 2000, Rael handed the Clonaid project over to Boisselier. Boisselier formerly taught chemistry at Hamilton College in Clinton, and worked as marketing director for a unidentified large chemical company in France. In interviews, she has said her 24-year-old daughter would be among the young women in the movement who would carry cloned babies to term. Experts have dismissed the notion that Clonaid is capable of producing a human clone because Boisselier does not have a track record in the field of either animal cloning or human reproduction. But Rael has said: "Nothing can stop science."

While I think this group should not be taken seriously, since it is only looking for cheap publicity which it has gotten in abundance, but I also think this group is telling us especially the Western world the kind of mentality that has governed

our times. The point they are making is that in the world of today there are no moral absolutes, except perhaps the will-to-power be it in economic, military and political plains. Further more, this group offers a commentary on what a secular culture can produce. We live at a time when many people have lost the sense of transcendence and where the term 'religion' has been given to anything. Thus any kind of claim could be made in the name of God; all kinds of evil are also justified in the name of God. Unfortunately, as Steve Wonder once observed the people who abuse religion has never shown any proof of consulting with God to perpetrate the evils which they claim God sent them to effectuate. The Raelians are really a bunch of warriors against anything transcendent; they perhaps wish to overturn age-old theism in a medley of scientific hotchpotch. Cloning is the last stage in the rejection of God by modern society; it represents the greatest attack on the mystery of Divine transcendence since the Tower of Babel; it is the most vicious attack on life and the effigy of a hatred for life and what it represents; it denies the sacral quality and the mysterious content of the reproductive process; it is a war on the family and a disservice to our human community. Above all, cloning must be understood not just as the breaking of God's covenant or the attempt to overthrow God, it is rather the failure to be human, to be created and to be empowered from above. It is the beginning of the death of man rather the end of theism. However, it is necessary for us to understand how we got to this level, in order to see what we can do to properly be what we are made to be and to allow the world to grow both from above and from within.

It is thus important that we Africans, especially the intellectuals, religious men and women, and indeed all men and women of good will must not lose sight of this kind of pervasive mentality of the Raelians on Christianity, religion, life and God. In this essay, we shall adopt a metaethical standpoint concerned primarily with the justification of ethical principles. This stance will be furnished with deontological prescriptive that establish the rightness of an act prior to the action. This is because the consequentialist morality, which is the safety net of science and technology, has placed morality at the whims and mercy of scientific determinism and experimental results.

1.0 DEFINITION OF TERMS

1.1 SCIENCE

Science is a term that is derived from the Latin 'scire' – 'to know', and as a noun it means knowledge. Ordinarily, it is a systematized knowledge of any subject. It is a truth acquired through a body of principles and a methodic path. In this general understanding, all

branches of learning arts, humanities, and philosophy are all sciences since they are systematic and coherent studies of aspects of realities through a specific methodology. We are however, concerned with science qua science that is, the experimental physical sciences which have to do with observation and empirical verification and validation. In this regard, Heidegger notes:

“The distinction of science lies in the fact that in an altogether specific manner, it and it alone explicitly allows the object itself the first and last word. In this objectivity of questioning, definition and proof, there is a certain limited submission to what is, so that this may reveal itself.”¹

The goal of all sciences according to Heidegger is to seek what is in itself, with a view to rendering it according to its quiddity (*Wasgehalt*) and its modality (*sciensart*) an objective of investigation and basic definition. Through and in science, man, one entity (*seiendes*) irrupts into what-is so that what-is manifests itself as and how it is. However, science wishes to know nothing of **Nothing**. The nihilation of Nothingness, which is an *existentialle* in *Dasein*, is achievable by the self-projection of *Dasein*. Projecting into Nothing, makes *Dasein* to go beyond what-is-in-totality through self-transcendence. What Heidegger is saying is that *Dasein* gives meaning to science (What-is) since it goes beyond what-is-in-totality.

Many other philosophers and scientists have defined science. A consideration of these definitions will help widen our understanding of science. According to Conant, Science is;

... an interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observation. These conceptual schemes are abstract models that change from time to time. They do not in themselves constitute reality.²

This understanding appears to limit science to Carl Poppers' conjectures and refutations or R. Carnaps' protocol sentences where every scientific statement rests on a provisional foundation. If this definition is accepted, one could rationalise that the last word should not be said of any scientific standpoint and this means that science should not be absolutized. The foremost scientific and enunciator of the law of relativity, Albert Einstein defined science as;

... the attempt to make chaotic diversity of our sense experience correspond to a logically informed system of thought.³

Science has first a procedure, then a provisional aim or object of inquiry is isolated with an accompanying control experiment, then the period of institutionalization, when the law(s) so confirmed is generalized. We can thus draw out some characteristics of pure or physical sciences: which is not exhaustive:

- I. **Science does not seek the origin of things:** This is to be properly understood. There are not and can never be scientific discoveries. What we call scientific discoveries are only the realization by scientists of aspects of the complex prism of nature. Those scientists who are investigating for instance the origin of human life are operating in an area where they have no provenance since scientific investigation should confine itself to phenomena and laws of phenomenal reality and life goes beyond the physically determined laws of science.
- II. **Science is concerned with describing events and phenomena in the world:** It seeks the causes of events and phenomena. It is faithful to empirical evidence and so excludes epiphenomenal and immaterial forces from its enquiry.⁴
- III. **Science has laws and methods, which are neither immutable nor absolute:** Science concerns itself with laws, which are subject to revision in the light of the immersion into the vast array of the givens of nature. Thus many scientists believe that the laws of nature have some consistency to the extent that the course of time and space flow in an ordered nature. There is always some provisional bent to science, which is the basis for improving the works of science. Science is therefore predictable to the extent to which its probational status suffices. No person has provided the reasons why some works of science work in one instance and fail in another. This is not to discredit science but to give it the proper place in the scale of things as a means and not an end that should be absolutized the way the Western world does today. Many thinkers like T. Chardin and

Kierkegaard are of the view that mankind has not exhausted half the potentiality of nature outside man and the latent power inside man. According to Kierkegaard;

*The riddles of the universe reveal themselves only slowly to our investigation; there are many questions to which science today can give no answer. But scientific work is the only road, which can lead us to knowledge of reality outside ourselves.*⁵

- IV. **Science cannot stand on its own:** It is becoming evident to scientists that the sciences have no autonomy. We now have interdisciplinary dependency wherein knowledge gained in one branch of science is applied to understand more the contents of other branches of science.

This is because the reality which science seeks to understand and perhaps govern is a connected whole.

- V. **Science is oriented to man:** We can therefore say that any scientific field stands or collapses to the extent to which it promotes or destroys man's well being. This position is corroborated by the arrow-head of empiricism, David Hume who writes:

*All the sciences have a relation, greater or lesser to human nature; and that however wide any of them may seem to run from it, they still return back by one passage or another. Even mathematics, natural philosophy and natural religion are in some measure dependent on the science of man.*⁶

A little history of mankind's intellectual itinerary will reveal that philosophy and science were inseparable until the Modern period when Descartes began a separation of science and philosophy which was incomplete in his ideational scheme, and which still is not yet fully made in contemporary philosophizing. In Plato, Spinoza and Hegel we discover intimations of a religio-ethical dimension of science. Leibniz, Locke and Hume pursued a course, which was purely scientific but did not carry this course to its term. Aristotle, Descartes, Bacon, Berkeley and Kant allowed some metaphysical and ethical refraction to shine on the pages of their scientific works. According to Bertrand Russell there are two

different ways in which a philosophy may seek to base itself upon science:

It may emphasize the most general results of science, and seek to give even greater generality and unity to these results. Or it may study the methods of science, and seek to apply these methods, with the necessary adaptations to its own peculiar province.⁷

Philosophy also brings the ethical dimension to science. Sadly, atheistic thinkers, empiricists and materialists who have an incurable aversion to metaphysical principles, have dominated the domain of philosophy of science.

The philosophies that have been inspired by scientific technique are power philosophies, and tend to regard everything non-human as mere raw material. Ends are no longer considered ... This also is a form of madness. It is, in our day, the most dangerous form, and the one against which a sane philosophy should provide an antidote.⁸

The fundamental questions are: Who provides the sane philosophy? What constitutes a sane philosophy? Is it the teaching of the logical positivists like Schilick, Carnap, Neurath, Hempel et al who regard metaphysical statements as unverifiable tautologies? Is it A.J. Ayer's postulations that in the domain of metaphysics including all philosophy of value and normative theory, logical analysis yields the negative result that the alleged statements in this domain are entirely meaningless?⁹ What evaluative key could logical atomism of Russell and Moore provide to morally ground Euclidian geometry or Newtonian physics? How can Wittgenstein's linguistic hermeneutics clip the unwieldy inhuman dimension of science? **It does appear that science must once more recover its meaning and goal via reconciliation between science and faith presaged in the Modern period.** In an address to the Pontifical Academy of science, Pope John Paul II praised Galileo the student of Copernicus whose telescope helped confirm Copernicus' heliocentricism for his commitment to keep his science and faith together. According to the Holy Father, Galileo sensed in his scientific research the presence of the creator who, stirring in the depths of his spirit, stimulated him, anticipating and assisting his intuitions.¹⁰ Albert Einstein finds the meaning and possibility of religion in the mysterious which accompanies man's

tireless techno-scientific effort to comprehend reality or existence. The quantum theorist Planck in his ***Where is Science Going?*** Declares: *“There can never be any real opposition between religion and science, for the one is the complement of the other”*.¹¹ It is therefore necessary that we state that while philosophy is the handmaid of theology, religion is the mother of science because it offers the terminus ad quem of science. We therefore see as preposterous and precipitate, having no ***fundamentum in re***, Comte’s law of three stages which deposes what he calls the ‘metaphysical yoke’ to enthrone a definitive religion – positivism – under the so-called scientific prestige.

1.2 TECHNOLOGY

Science and technology are often seen as correlatives and so they appear. However, while science is based on observation of particular occurrences, inductive generalization and classifications of things according to the mode of their functioning, technology is a form of human activity concerned with the making and fabrication of products, machines, infrastructures and superstructures for man’s good. Etymologically, technology comes from two Greek words ‘***techne***’ and ‘***Logos***’ (Science).

Techne means a set of principles, or rational method in the production of something or in the achievement of an end. It can also mean the knowledge of such principles or method.¹² Technology in this sense is the application of science to enhance the quality of human existence. In Heideggerian vocabulary, technology understood as *techne-logos* is the revelation of the inner potentialities of the knowing man in new light of presencing in which he himself is also revealed as a bundle of potential actualities.¹³

Abstracting from Aristotelian fourfold causality, Heidegger arrives at the conclusion that the essence of technology is by no means anything technological; the essence of technology is located in the fourfold causality of Aristotle. Technology is thus understood as how man’s action (efficient cause) makes use of the givens of the universe (material cause) in producing technical things (formal cause) in view of a better life – an enhanced quality of life for man (final cause).¹⁴

Many people distinguish between primitive technology and modern technology in terms of their advancement of human civilization. Since we cannot divorce civilization from culture and since culture is a rich tapestry of varying tendencies, it seems

apropos to argue that many cultural factors influence the level of technological development of a people.

Technological progress is therefore assured on two grounds on the grounds that man seeks self-fulfillment through labour-the fabrication of things; including works of art-by creatively employing the physical and the mental, indeed of all the qualities of men and women. And on the grounds that ... social structures that are not conducive will be replaced by conducive ones.¹⁵

The industrial revolution of the 19th century has shown that when the requisite intellectual, political and economic environment is created, technological development would follow. This is not to detract from the fact that the necessities of war, deleterious climatic and environmental disasters could give rise to technological development. The industrial Revolution however marked a turning point in world history. The use of machines had revolutionized agriculture allowing more land to be cultivated, crops to be more efficiently harvested, processed and distributed to help sustain the ever increasing world population; aiding the understanding of man's anatomy and facilitating the formulation and administration of medicine which led to improved longevity.¹⁶

The Industrial Revolution also brought out the negative effects of technology: it led to colonialism of most of today's Third World countries marking the movement from the domination of nature to the domination and damnation of man by man, there was a rise in the emergence of atheistic thoughts and the ascendancy of humanism whereby man in the words of Jean-Paul Sartre could achieve a unity of a single consciousness in a new world without God "...man being condemned to be free carries the weight of the whole world on his shoulders, he is responsible for the world and for himself as a way of being."¹⁷

There was loss of job during the Industrial Revolution as a result of mechanisation, which atomized man; moral laxity reigned supreme with the attendant social contagion of insecurity. Above all, sophisticated war arsenals were produced and disrupted the arcane peace of a newly industrialized world. It is worth noting that the Franco – Prussian War (1870 – 1871) that disrupted the First Vatican Council in 1870 irrupted as a result of rivalry among the European powers over whose voice should resound over and above the others in determining the political equation of an emergent industrialized world of infinite probability.

In concluding this section, we wish to admit that as Shakespeare wrote in his Hamlet Act 1, Scene 5 "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy." Many scientists admit as much. For Kepler Johannes

whose three laws of planetary motion form the basis of modern planetary astronomy, the heavens do indeed declare the glory of God and there is no conflict between science and faith. Isaac Newton who developed the theory of differential calculus and the three laws of motion wrote theological as well as scientific works.¹⁸ Carl Popper, while not admitting the complementarity between science and morality admitted in his rejection of the inductive scientific method that scientific theories are an approach to the truth, but never the final truth. Discussing the origins of natural science, C.S. Lewis says: "Man became scientific because they expected law in nature, and they expected law in nature because they believed in a legislator."¹⁹ We must therefore give up any ideology of technological progress, which depends on the notion that human beings can be in total control of the world. This does not mean that we should abdicate our concern with human material progress through science and technology. In the history of science and technology many priests have made significant contributions, showing that the Church is one of the greatest agent for the cause of the sciences. However, the cause of science and technology is to be placed at the altars of the Most High God. Some of the scientific discoveries of priests worth mentioning include:

- The first geographical chart or map was produced by Fr. Mauro of Venice (1459).
- Fr. Lazzaro Spallanzani (d. 1799) was the first to explain correctly the nature of the spermatozoa and the physiologic process of digestion. He also proved the regeneration of matter and the falsity of spontaneous generation.
- Fr. Jose Algue (b. 1850) a Jesuit made valuable investigations on the large spiders of Malaysia and discovered the silk thread spun by them and made spinning and weaving possible. The list is endless and has been enriched by our own priests- in Africa, for example the pioneering agricultural revolution in Benin Republic is led by a Catholic priest – scientists and many lay faithful who have couched their scientific and technological works in a religio – ethical cumulus. In effect, we can conclude that the Church is a friend of science and technology. The Church is however against all forms of technicism which places absolute faith in our technological culture and makes the urge for technical control the motivating power of human thought and action; placing God at the periphery of human existence, while dichotomizing man through an innocuous scientific

mentality. This could be likened to Heidegger's 'enframing' of technology that is a situation whereby technology exhausts man, absorbing man to the forgetfulness of his own actualities.

The manifestations of these will be shown in the latter part of the work. We conclude this section by re-echoing the words of the fathers of the Second Vatican Council:

*Science and technology require for their own intrinsic meaning, an unconditional respect for the fundamental criteria of the moral law; that is to say, they must be at **the service of the human person**, of his inalienable rights and his true and integral good according to the design and will of God.²⁰*

2.1 HUMAN LIFE

For Africans, human life is to be prized and not priced; indeed there is an understanding of life as a chain of growth and development that begins in the womb and continues after birth. In traditional African society, even miscarriage is seen as a curse and abortion is perceived as an unspeakable taboo that wounds the spiritual bond of the family and the community. To be pregnant is seen as to be in the hands of God since the pregnant woman is seen as a messenger of God because of the sacral quality of the gift in her womb. Thus the preservation of human life from the womb to the tomb is an essentially demanding but rewarding responsibility. The appreciation of the giftedness of each of us is the first condition for both being authentically human and properly oriented to live in society or to participate in leadership. One needs to be truly concerned and actively committed about the good of others, especially the unborn who are the connection with the ancestor and the community for him or her to be genuinely human and climb the scale of being. Human life is the sacred gift of God and the right to it is directly from God alone. Indeed, Africans believe in the sacredness of life and have always respected life as the greatest gift from God to the community. The child even when he is still in the womb is a corporate personality, in line with the belief that every person is the bearer of the collective destiny of the race since the life of each person is given for the enrichment of the community. This is why the present invasion on human life through abortion, contraception, sterilization, cloning and other forms of attack on the womb by some Western agencies with the support of African

governments is regrettable. From the philosophical perspective, life is a common phenomenon because man experiences life in himself and in others. Life, however, does not lend itself to an easy definition. A scientist would regard life as energy and power, which gives activity and mobility to a given device. However, no matter how finely ordered a mechanical device might be, its organization whether simple or complex is extraneous. Thus life, while maintaining itself by physical, chemical and biological processes belong to a realm above these processes. Metaphysically, life is defined as "that which makes a being naturally capable of self-perfective immanent activity".²¹

By immanent activity, we mean that the activity originates, remains and ends in the agent for its own good. How is this possible given the fact that whatever is moved is moved by another (***Quid quid movetur ab alio movetur***). Aristotle avers in his ***De Anima*** "what has soul in it differs from what has not, in that the former displays life."²² The soul is therefore the animating principle of life of a natural body having life potentially in it. Aristotle defines the soul as "the first grade of actuality of a natural body having life potentially in it."²³ Each layer of existence has its own animating soul. Plants have vegetative soul; animals have sensitive soul, while man has a rational soul.

Human life is ontologically different from all other forms of life because of man's soul and the complexities of his operation. If this is so, why do many people define human life in absurd terms? A scientist defined life as an accidental coincidence on a minor speck of interstellar dust." Samuel Becket in ***Waiting for Godot*** writes: "Life has no reasons; a struggling through the gloom, and the senseless end of it is the insult of the tomb." Shakespeare said of life that it is a tale told by an idiot, full of sound and fury, signifying nothing. For Longfellow "life is but an empty dream" while Thomas Browne saw life as the shadow of death.²⁴ I however do not think this is the type of life pro-lifers are called to defend. Gabriel Marcel, in this regard argue that **a correct understanding of human life, human person and dignity is not possible unless we succeed in making explicit the properly sacral quality peculiar to human existence.**²⁵ This brings up the idea of man as a person. **Indeed, when Christian philosophers talk of man as a person they mean the uniqueness, unrepeatability, absolute value and sacredness of the individual as an individual substance of a rational nature** (Boethius). According to Maritain,

*Whenever we say that a man is a person, we mean that he is more than a parcel of matter, more than an individual element in nature such as an atom, a blade of glass, a fly or an elephant.*²⁶

These reflection calls to mind the words of Psalm 8:3-4 "what is man that thou art mindful of him, and the son of man that thou dost care for him". This exaltation is re-echoed in Shakespeare's *Hamlet*, Act II, Scene II: What a piece of work is man! How noble in reason! How infinite in faculty! In form and moving, how express and admirable! In action how like the angel! In apprehension how like a God! The beauty of the world! The paragon of animals". Man is thus a 'specie being' in the words of Marx for whom his own life is an object for him. Heidegger sees the essence of human life in his ek-sistence meaning that man alone stands in the lighting or clearing of being and reciprocally stands out as man into the truth of Being. The lighting or clearing of Being belongs to the (Da) of the human being as there- being (Dasein).

In addition to his intellect, man has freedom and will, self-awareness, self-consciousness, self-knowledge and self-transcendence. Human life is therefore in the words of B. Lonergan one mediated by meaning through which man achieves authentic subjectivity "... of genuine attention, genuine intelligence, genuine reasonableness, genuine responsibility."²⁷

Various theories of life like mechanicism, organicism, spontaneous generation, evolution, the Big Bang theory or even Monod's generation by chance or Heisenberg's uncertainty principle fall in the face of vitalism.

Indeed, none of these theories can be exculpated from reductionism, which is an attempt to make the part greater than a whole or to understand the whole through the parts. Also, they fail to explain the irreducible requirement or the first principle of existence what Chardin calls the 'radial' or 'the within' of things. Through his principle of hylomorphism, Aristotle has shown that there is a union between the body and soul, which is neither provisional nor accidental, but substantial. Man is thus united in the unity of his totality. To the reductionists Aristotle argues:

This is why we can dismiss as unnecessary the question whether the body and the soul are one: it is as meaningless as to ask whether the wax and the shape given to it by the stamp are one ... Unity has many senses, but the most proper and fundamental sense of both is the relation of an actuality to that of which it is its actuality.²⁸

Christianity holds that man is created in the image and likeness of God. **The deepest layer of the human person's dignity and rights consists in its property of resembling God. No understanding of man could be accepted unless it incorporates his intimate link with God his creator. This intimate link and sublime union was**

brought about by the Incarnation when Christ identified with man in all the dimensions of his existence and ennobled human nature (life). It is in the mystery of the Word made flesh that the mystery of man truly becomes clear. By his incarnation Christ has united himself in some sense to every man for "man is the only creature on earth that God willed for himself".²⁹ In this regard Pope John Paul II teaches thus:

*In Christ and through Christ God has revealed himself fully to mankind and has definitively drawn close to it; at the same time, in Christ and through Christ man has acquired full awareness of his dignity, of the heights to which he is raised, of the surpassing worth of his own humanity, of the meaning of his existence.*³⁰

Human life, whether intellectual, spiritual, affective or political demands the sublimest respect because of its spiritual origin and ontological constitution; man, according to Kant, exists as an end in himself and not merely as a means to be arbitrarily used by this or that will.

Let me state what I conceive as the ten Christian principles on human life:

1. Human life is the sacred gift of God and the right to it is directly from God alone. Human life is received neither from techno – science nor from man nor from society but from God. The principle here is that you cannot give what you don't have nor can you take what you do not own.
2. God alone has absolute proprietary right over human life. Man's use of it is limited to possession and usufruct. The principle here is that one cannot act as he pleases in his personal life and in his inter-subjective relations.
- 3 All human life is equal before God. This means that there should be no segregation, social stratification or profiling on the basis of race, tribe, sex, nationality, age or creed etc.
4. Human life has an absolute inviolability once it is innocent. The Holy Father and many men and women of goodwill are calling for the abolition of death sentence since it does not remove the guilt of crime nor equalize the social balance tilted by the criminal. One act of violence cannot nullify another act of violence, even if one act of violence like murder is carried out

by a wicked person and the other by a justice-enforcing state apparatus. Thus the killing of a murderer cannot bring a sense of closure to the fact that he killed another nor does it also nullify the fact that one more death in this case the death of the murderer diminishes the world.

4. The absolute inviolability of the innocent person does not lend itself to and is above the calculations of utility.
5. Human life is to be respected and protected absolutely from conception to natural death.
6. All human life is for the service of God and the neighbour in conformity with justice, prudence and charity.
7. Every life is worth preserving as long as God designs to sustain it. This guards against euthanasia sustained by the myth of physical efficiency and productivity.
8. Man is a composite of soul and body. The preservation and cultivation of both constitute the object of his right to life.
9. Every one has a right to be conceived and born in a family environment. All interventions on the genetic heritage of the human person and embryonic manipulation not aimed at correcting anomalies constitute a violation of the right to bodily integrity and contradict the good of the family.

3.0 THE PLACE OF SCIENCE AND TECHNOLOGY IN HUMAN LIFE: A META-ETHICAL AND DEONTOLOGICAL CONSIDERATION

Though science and technology cannot produce that final adjustment of well-defined generalities, which constitute metaphysics, they have no doubt improved the quality of life. Nuclear physics promises to provide inexhaustible sources of energy though the Chernobyl (Ukraine) nuclear power plant leakage of 25th and 26th April 1986, the worst technological accident this century has shown us the limitations of technology. According to the UN Chronicle (Spring 1996) about 9 million people have been affected, 375,000 people have been displaced; 800,000 were severely affected and morbidity rate was 30 per cent. The former UN Scribe, Boutros Boutros-Ghali at the 10th commemoration of Chernobyl said: "Chernobyl has become synonymous throughout the world with our fear of technological catastrophe: it symbolizes a penance for our unchecked desire for progress." Today there is real threat to nuclear

proliferation even as dictatorial regimes like the one in North Korea seeks to threaten the world with its nuclear arsenals. We face the danger of weapons of mass destruction as well as the increasing threat of terrorism brought about by the wrong use of weapons.

There has been an explosion in information technology. Cybernetics (internet, MIS - Integrated Management Information System, LAN – Local Area Networks, CD Roms i.e. digital information copied unto smaller compact discs, E-mail etc) are automating industrial and commercial operations and making the world a global neighbourhood. Biogenetics and biochemistry are disclosing the secrets of life and may soon retard aging and death. Astronomy and the many space shuttles are opening up life in outer space and wielding a marriage between man and the complex constellations above him. Indeed science and technology have improved the quality of human life in a great way.

We must however be wary of techno-scientific triumphalism, which our secular – materialistic world is imposing on human life. We shall now discuss seven (7) areas where science and technology have not served man properly: War Fare, Environmental Pollution, Disease Control, Inter-Subjective Relation, Birth Control, Manipulation of human reproduction and Manipulation of Genetic make-up of man.

3.1 WARFARE: The 20th Century can rightly be described as the century of wars through sophisticated weapons. Though the Cold War has thawed. The situation in the Balkans, the present hellish onslaught against the Chechnens by Russia, the Intafidah in the Middle East, the threat of war in the Persian Gulf, the senseless suicide killings, the terrorist attacks on the the Twin Towers and the terrorist activities from the Paradise Hotel in Mombassa, Kenya to the theatre killings in Moscow and the painful killing of Bali, the Xenophobic violence of Indonesia against the East Timorese, the painful sequestering of human lives in the Horns of Africa and the restive situation in Kashmir are sad reminders that men prefer to war-war instead of jaw-jaw.

The deep rumbling of war that we hear in the Arabian Gulf and from the Halls of the UN is the thunder of national pride and economic adventurism that would create dungeons of poverty and cast a dark cloud of insecurity and terrorism in the world. Violence and war can only bring the peace of the grave; it brings temporary victories but not permanent peace; it brings pride to the victor and suffering to the defeated; it humiliated the opponent but does not reform him. War brings bitterness to the survivors and brutality to the destroyers. It is a bypassed phase in our human evolution and should be considered by all men and women as the sign of spiritual impoverishment. People go to war because they have weapons of war produced by science and technology. Indeed; "The

vast instruments of terror that have been built are external monuments of our evil passion.

Nothing in the non-human world afford the ground for existing hostility.³¹ The horror of these weapons of mass destruction was manifested in Nagasaki and Hiroshima when only 45kg of uranium and 20,000 tons of chemical explosives were released destroying 62,000 houses with thousands of human victims. The fallout from these weapons can cause serious radioactive effects that can destroy the whole human race. Other effects include the distortion of colour pigment, mutation of genetic component, poisoning of aquatic lives, destruction of the flora and fauna and cancer.

3.2 ENVIRONMENTAL POLLUTION: The unethical exploitation of the earth has thrown up our world into the throes of environmental degradation. In the US, 142 million tons of smoke and noxious fumes are dumped annually in the atmosphere. Jacques Cousteau estimates that fish and plant life declined in our seas by 50% in the last 20 years and the oceans could well be dead by the turn of this Millennium. If the oceans died, mankind will vanish because through the incredibly rich underwater plant life they produce, man gets the oxygen for respiration.

According to the UNEP, 80% of all marine pollution is caused by various human activities on land. More frightening is the depletion of the Ozone layer by methyl bromide and Hydro chlorofluorocarbons (HCFCs) among other chemicals, which are causing global warming, and the diminished oxidation of the atmosphere all of which threaten human life. Unfortunately, the signing of the Kyoto Accord has become a political issue in those industrialized countries whose unrestrained environment pollution led to the Kyoto Accord in the first place.

There are also cases of ecocide by the industrial world against the Third World. Green Peace International reports that since 1986, the US and Europe have shipped hazardous wastes to at least 11 developing countries – Brazil, Haiti, Lebanon, Mexico, Nigeria, South Africa, Syria, Venezuela and Zimbabwe. At least 38 other countries are being proposed for waste schemes. Some of these wastes contain lead, arsenic, polycyclic, aromatic hydrocarbons; PVC plastic which if burned would release two most toxic substances, dioxins and furans into the atmosphere.

3.3 DISEASE CONTROL: Science has not found a cure for AIDS, Alzheimer Stroke, Cancer, Parkinson's disease etc. For Africa unfortunately ravaged by malaria, typhoid fever, Ebola fever and sickle cell, science has offered little cures but not vaccines, which could obliterate them like small pox. Some of these diseases pose the most serious threat to life in Africa along with poverty, bad government, illiteracy and the debt burden. Even

though, the Western World would attribute these to over-population, we think population is not a problem to Africa if the West valorizes trade with Africa, soft pedals on its economic protectionism, cancels the debts of Africa and ceases from foisting an unwholesome birth control regime on Africa, Africa would rise. If the Western world wants Africa to survive, why is it that the AIDS treatment drug AZT is placed at an unaffordable price to Africans?

- 3.4 INTER-SUBJECTIVE RELATION:** Apart from debasing man morally and spiritually another danger of our scientific determinism is that of alienation. This is the view of Erich Fromm, who sees man's alienation in modern society as total, pervading his relationship with his fellow men, to his work, his food and to himself. Our expanded knowledge has not abolished war, fear, exploitation, inhumanities etc, rather it has isolated men, made them anxious and uneasy than ever;

Confused as to his place in the scheme of a world growing each day closer yet more impersonal, more densely populated yet in face-to-face relations more dehumanized ... man has become mechanized, routinized, made comfortable as an object.³²

Man is thereby losing what Viktor Frankl the Viennese psychiatrist calls a value – centre with an accompanying vacuous existence. This is clearly manifested in our birth control and reproductive technology where we have through our uncontrolled sexual appetite and lack of fellow-feeling, sundered the humanistic – spiritual springs which anchor human life to the divine mast in its origin, unique history and destiny. We must seek a renewed sense of community in the world wherein solidarity with the poor and the suffering would take central place in the world of today; the individualism of the Western society is one sad tale that could be healed by the community spirit in Africa which is also threatened by the selfishness that the struggle for scarce resources has generated.

- 3.5 BIRTH CONTROL:** Six forms of birth control methods have been identified in many parts of the African continent: Barrier methods, hormonal method, intra-uterine contraceptive device, voluntary surgical contraception (sterilization), abortion and natural family planning.
- Barrier Method – condoms (male and female), spermicides, diaphragm.
 - Hormonal Method – Female and male pill (the latest being) gossypol introduced by John Hopskin University USA injectable

contraceptives (the latest in Nigeria being cyclofem and implants e.g. norplant and implant).

- IUCD – Copper T.380A (Common in Nigeria) and multiload CU 375.
- Voluntary Surgical Contraception – Vasectomy (males) and bi-tubal ligation (BTL) for females – an euphemism for sterilization.

A recent study shows that the number of families using the natural family planning method is going down. This is because of the activities of the Planned Parenthood Federation of Nigeria (PPFN), Society for Family Health, and United States Agency for International Development (USAID), United Nations Fund for Population Activity (UNFPA), UNICEF, and Pathfinder Fund etc, all of which promote artificial birth control. The same propaganda is carried on in our newspapers and billboards. The pro-life movement in Nigeria, for example, seems to be overwhelmed by the anti-life campaign of these international organizations. It is sad to note too that the West predicates its foreign assistance to Third World country on their compulsory adoption of artificial birth control.

One may ask: **Why is the West so much concerned about Africa's population?** Is the West concerned about the good of Africa and it watched in silence when the genocide was going on in Rwanda and Burundi? Are the Western countries interested in the good of African when it has failed to cancel the bludgeoning debt of African countries which self-serving leaders with the active connivance of the Western countries, brought on their people? The list could go on. The reason for the interest of the Western world in the population of African is far from altruistic, as we shall immediately show. The population control movement had its origins in the *Essay on the Principle of Population* of Rev. Thomas Malthus. Malthus had argued that population increased by geometrical progression, while food supply increased by arithmetical progression. The population would overtime outstrip food supply leading to poverty, misery and vice. Darwin in his *The Origin of Species* argued that civilized societies weakened themselves by a misplaced compassion for the savages of the earth who should not be allowed to propagate their kind. Francis Gulton used Darwin's ideas to formulate the science of eugenics. This is the belief that certain people are of a superior strain and that the race can be improved from them. The two most influential campaigners for birth control, Marie Stopes in England and Margaret Sanger in America were both racists and eugenicists whose primary interest in birth control lay not in assisting women to space their children, but in the prevention of births to group considered undesirable.

According to Marie Stopes: **“Society allows the diseased, the racially negligent, the thriftless, the careless, the feeble minded, the very lowest and worst members of the community to produce innumerable tens of thousands of stunted, warped, inferior infants ... to drain the resources of those classes above them who have a sense of responsibility.”** She advocated the sterilization of all women of inferior stock to prevent any miscegenation. Sanger coined the slogan “birth control to create a race of thoroughbreds”. She advocated the sterilization of such women. Both co-operated with the Nazis during the holocaust since the ideas of Hitler in *Mien Kampf* were akin to theirs. The Nazis programme to breed a master race moved swiftly from mass sterilization to euthanasia of the physically and mentally handicapped, to the concentration camps in which six million men, women and children regarded as inferior perished in gas chambers. When the truth of the Nazi holocaust became known after the war, the eugenics movement went underground only to come up with family planning with the deceptive ideas of global over-population. This new holocaust was targeted at defenseless lives in the womb and hapless women and families.³³

The West because of its unwholesome family planning practices is fast losing its Replacement Level Fertility (RLF). Caroused by her techno-scientific power and buoyed by an anti-life contraceptive mentality, the West has turned to Africa to destroy her pristine respect for life and sever her deep communitarian culture that irradiates from the centre of the **Umunna (family lineage)**.

The Africa's understanding of man as a corporate personality makes him a being – with others the unborn, the young as well as the old and the dead. Is it not hypocritical that after signing the Mexico Declaration of 1984 and the Cairo Declaration of 1994 rejecting abortion as a means of family planning, most countries of the West still uphold the legality of abortion? Is it not unwholesome that despite the many dangers posed to women's health and emotional trauma, the West is actively promoting abortion in Nigeria? I understand the abortion pill RU 486 is now marketed in Nigeria by Hoechst. The Nigerian government seems to have adopted a conspiracy of silence in this regard. No Nigerian law upholds contraception or sterilization yet condoms are freely marketed and in some places freely distributed as the golden route to safe sex. However, safe sex is irresponsible sex and sex without love and commitment. Again, in the laws of the Federal Republic of Nigeria Vol. 21 Cap 45 of the Criminal Code Section 222 – 260 abortions is outlawed, but the drive for commercial gain has vitiated the fidelity to the Hippocratic oath in many doctors. The government has not failed to monitor the doctors nor has the Church spoken loudly about the existential moral cesspool of abortion and contraception. As the Holy Father has said:

*We are facing an enormous and dramatic clash between good and evil, death and life, the 'culture of death' and the 'culture of life'. We find ourselves not only 'faced with' but necessarily in the midst of this conflict'. We are all involved and we all share in it with the inescapable responsibility of choosing to be unconditionally pro-life.*³⁴

We conclude by noting that it is not science and technology that determines what should be licit in birth control hence the slogan, 'if it is possible, it is desirable' should be jettisoned' but man's nature (reason) and his ultimate destiny and transcendental upsurge determines what is good for man. Even if population problem exists (which is not the case at least in Nigeria), we reject all unethical birth control measures and systematic anti-child bearing campaigns sometimes propagated with pressure and misinformation, which are against our cultural and religious identity.

3.5 MANIPULATION OF HUMAN REPRODUCTION: According to Evans Debra, in the history of science, the twentieth century will be remembered for many things, but among the most significant, the disconnection of life's beginning from the intense intimacy of sexual love will be ranked right along with the Manhattan Project, mass-produced antibiotics, and the discovery of DNA.³⁵

Before 1938, when the first public egg hunt was announced by John Rock and Arthur Hertig and the studies of geneticist, Robert Edwards and obstetrician – gynecologist Patrick Steptoe in England, very little was known about the intricate mechanisms of sexual reproduction. It was not until 1827 that the existence of a human egg was discovered. Another sixteen years went by before it was clearly demonstrated in 1843 that a sperm actually enters an ovum during conception. Only in 1875 was it shown that fertilization takes place when the nucleus of the sperm joins with that of the ovum. The two sex hormones produced by the ovaries, estrogen and progesterone were not discovered until 1924 and 1934. It was at this point that Rock and Hertig entered the race to discover additional secrets about early human development. The results of their experiment have been an amazing interference in the domain of reproduction by man. Some landmark events in reproductive technology are:

- 1782 – use of artificial insemination in dogs
- 1890 – birth from embryo transplantation in rabbits
- 1953 – use of cryoprotectant to successfully freeze and thaw animal sperm.
- 1976 – first baby born after IVF in UK

- 1983 – embryo transfer after uterine lavage (embryo flushing).
- 1985 – baby born after gamete intra-uterine Fallopian Transfer (GIFT).

Let us briefly define these reproductive processes;

- I. **Artificial Insemination:** is the deposition of the semen of the husband (AIH) or a donor (AID) by a mechanical instrument into the cervix of a woman's uterus. No sexual relationship is involved.
- II. **In Vitro Fertilization (IVF):** Refers to conception occurring in a laboratory apparatus. The name literally means 'in glass' fertilization. Laparoscopy has greatly enhanced this process. Semen is usually obtained through masturbation.
- III. **Surrogate Mother:** A woman who agrees to have another couple's embryo transferred to her uterus for the period of gestation until the time of birth; a woman who bears no genetic relationship to the baby in her womb. The common usage is a woman who agrees to be artificially inseminated with the sperm of an infertile woman's husband for a fee and the womb for sale.
- IV. **Artificial Embryonation (AE):** The process by which a human ovum is artificially inseminated within a woman's reproductive tract and then flushed out five to seven days later for transfer to another woman's womb; or the transfer of an embryo from the womb of a fertile donor to the uterus of an infertile recipient who will attempt to carry the embryo to term. It is also called in vivo fertilization. This is closely related to Embryo Transfer (ET). The placement of an embryo fertilized in vitro or in vivo into the uterus of a woman.
- V. **Cloning:** I stumbled on a hand-out for scientists on cloning and this is what the instruction advocated for the process of cloning from beginning of the process to its end:

Materials

- Human Tissue: Pure human cells of one tissue type, from the individual who will be cloned.
- Human Tissue Culture Media: Media in which these human cells will grow and divide.
- Minimal Human Tissue Culture Media: Media in which cells will stop dividing, and enter a state of "quiescence" without dying.

- Laboratory supplies: Incubator, Sterile Hood, petri dishes, microscopes, and tools capable of removing and implanting cellular organelles, such as the nucleus, from one cell to another.
- Unfertilized human egg cells.
- Human Egg Cell growth media: Media where fertilized eggs will grow and divide.

Procedures

1. Grow the human cells to be cloned until you have a good supply.
2. Transfer the cells to minimal media. [For now, The Sheep Cloning Paper is a good reference for exactly how long.] This should allow the cells to live, but they should stop dividing and enter quiescence. This is likely the step in which the cells lose their differentiation, and revert to a more totipotent state.
3. When the cultured cells are in the quiescent state, get an unfertilized human egg cell. Remove the nucleus from this egg cell. Try to minimize damage done to this cell and discard the nucleus.
4. Take one of the quiescent cells in it's entirety, and implant it inside the coat around the egg (known as the zona pellucida) next to the egg itself.
5. Electroshock the egg. [For now, The Sheep Cloning Paper is probably a good reference for how much and how long to electroshock.] The electroshock induces the fusion of the two cells, so you should be able to tell when you've electro shocked enough just by looking at the cells. The rebooting of the human genetic program is believed to be initiated by the replacement of donor cell protein signals by egg cell protein signals, but the electroshock might assist in moving those protein signals across the nuclear membrane as well. Electroporation is a common technique for moving DNA molecules through a cellular membrane.
6. Repeat the last three steps as necessary until you have enough clones. Expect a lot of them not to survive because of cellular damage and other mishaps. Allow the embryos to grow and divide a few times in Human Egg Cell growth media.
7. Implant the embryos in human mothers where they will be carried to term, and born normally.

From this process one would see that cloning is the artificial reproduction of an organism that is the exact genetic copy of a living organism. The nucleus of a mature but unfertilized egg is removed by microsurgery or is incapacitated by radiation. Then, the cell is provided with a nucleus from a donor body cell, often taken from the intestine.³⁶ Cloning can give genetically identical children to those incapable of getting children by natural and artificial method. It could replicate some individuals of great genius. It allows the preservation of a given genotype that might be seen as a way of attaining biological immortality. It

helps in tissue or organ repair in later years. Couples can pick the sex and physical characteristics of their child. It can help overcome some genetic defects and diseases of a clonee in the cloned.

Added to cloning is the embryonic stem research. For many years, adult stem cells have been used to treat diseases like Parkinson, multiple Sclerosis, Crohn's disease among others. These stem cells or Master Cells obtained from the blood, bone marrow, skin, brain tissue, muscle and fat is now being jettisoned by some scientists who think the best stem cells could be those obtained from an embryo. They thus propose the multiplication of embryo for scientific or therapeutic purposes. All these are signs of a growing loss of the mystery of life and respect for the right of the unborn.

Are these processes licit? How do they constitute threats to human life? The Congregation for the Doctrine of the Faith's document ***Respect for Human Life in its Origin and the Dignity of Procreation*** of 1990 offers the best sound response to these questions. This document is widely quoted even by our separated brethren. Let me enunciate some of the salient instructions in this great magisterial document.

1. Life is a gift from God. Generating life via these afore-mentioned procedures goes beyond the limits of man's dominion of the earth. It counterfeits the natural processes of reproduction and devalues human life. No couple has a right to a child unless granted by God. Children are not among those rights, which we can enforce scientifically.
2. "Science and technology are valuable resources for man when placed at his service and when they promote his integral development for the benefit of all; but they cannot of themselves show the meaning of existence and human progress."³⁷
3. These procedures because they do not respect the substantial union in man between the spiritual soul and the human body are an onslaught on man's identity and personhood.
4. The transmission of human life is entrusted by God to man and involves a personal – conscious act. Methods of reproduction, which are applied to animals and plants, should not be used for man.
5. The Human embryo should not be used for diagnostic, therapeutic, scientific and commercial interests. These encourage the

commodification of the embryo and genetic disenfranchisement of new born.

6. Life begins from the moment of conception. The embryo could never be made human if it were not human already.
7. Therapeutic procedures must respect the life and integrity of the embryo and should not involve disproportionate risks to it.

We may conclude this section by noting with Dr. Leon Kass:

What is new is nothing more radical than the divorce of the generation of new human life from human sexuality ... the mysterious and intimate processes of generation are to be moved from the darkness of the womb to the bright light of the laboratory... we are considering not merely new ways of beginning individual lives, but also new ways of life and new ways of viewing human life and the nature of man. A man is partly where he comes from and the character of his life and his community will no doubt be influenced by the way he comes.³⁸

3.6 **MANIPULATION OF GENETIC MAKE-UP**

Modern genetics began with the Austrian Monk Gregor Mendel in the 19th century. He studied inheritance by means of experiments with garden flowers. He discovered genes as the repository of more or less dominant and recessive traits of hereditary. In 1902 Walter Sutton discovered that genes are located in the chromosomes through his studies of grasshopper. Thomas Morgan discovered that chromosomes determine the set of offspring. While way back in 1867 Friedrich Meischer discovered that cells contain a slightly acidic substance in their nuclei called nucleic acid. By 1940 it was discovered that the genes with the cell chromosomes are made of DNA. It was James Watson and Francis Crick who determined the structure of DNA in 1953 and also found out that information transformation occurs in a given gene is transcribed into a messenger DNA. It was in 1970 that scientists Nathan and Smith discovered that one could splice the DNA to change the genetic code. This technology can be used to repair damaged or undesirable genes (therapeutic use); it can also be used to redesign offspring with genes and traits of one's choice (eugenic use) or create altogether new organisms for use in agriculture and industry. In man, this has led to genetic screening, sex selection, and gene-splicing in recombinant DNA. Our response to these could be summed up in the words of Amald De Marco:

The enthusiasm for genetically engineering homo novus or homo futurus betrays a profound misconception of genetics. Man is infinitely more than his genotype. Genetic engineering can do very little to improve him as a human being. ³⁹

CONCLUDING REFLECTION: ROAD MAP FOR THE THIRD MILLENIUM

In the first Christian millennium, the threat to faith was a loss of awareness of the identity of God as both Creator and Father; the divine monarchy was in the danger of being supplanted by a supreme diarchy of two distinct ultimate principles – one of good and one of evil, one of the creation of matter and the other of the salvation of soul, one of the old covenant, the other of the new. During the second millennium, the threat to faith was the near rejection of the first article of faith, because of the loss of an awareness of the difference between creature and creator, finite and infinite, world and man. In the third Christian millennium, the Harvard expert on world strategy Samuel P. Huntington foresees the ingress of a clash of civilization as the emergent global tendency. The conflict in the Third Millennium will be between the culture of death and the civilization of love; between the optimistic pseudo – idealism of techno-scientific ascendancy and the pessimistic pseudo realism that extends from Machiaveli to Hitler even up to Milosevic that bends man under the iron will of violence. These could be in form of terrorism, cultural conflict, and wars for economic interests among others.

Above all, the collective totalization of man, which Chardin envisions in his Christogenesis, when the positive leaven of Christianity shall crystallize in the world, cannot come without a clash and a battle. Pope John Paul II calls on us theologians and philosophers to introject a **Sapiential dimension** into the vast secularistic trajectory of our age in the next millennium. This involves the casting of a genuinely metaphysical range as a foundational Archimedean point to undermine the anti-transcendental empirical techno-scientific order that threatens our corporate existence in this planet earth. At the end of this millennium, we must move from phenomenon to foundation, from mere experience to deep awareness of our human destiny as homo viator (pilgrim). Theologians are called upon to make not only an **itinerarium mentis in natura** but also an **itinerarium mentis in Deum** (Bonaventure) to fully penetrate the heart of philosophy, theology and other fields of learning so as to be enlightened pro-lifers and articulate vanguard and defenders of the deposit of faith. As the Pope counsels, the sapiential dimension is all the more necessary today **“because the immense expansion of humanity’s technical capability demands a renewed and sharpened sense of ultimate values. If this technology is not ordered to something greater than a merely**

utilitarian end, then it would soon prove inhuman and become potential destroyer of the human race".⁴⁰

We propose therefore the humanization of science and technology in this New Christian Millennium. This cannot be possible until we adopt and adapt a **theandric** – cosmic dynamic relationship(a God- man-world symmetry) – an ethical metaphysical position that properly understands the complimentary relationship between techno-science and faith at the service of human life, and their mutual enrichment of man and nature in the love of his neighbour and worship of God.

As stewards of this created earth we should not to be afraid to build in this Millennium a civilization worthy of the human person, a true culture of life, a civilization of love that respects the dignity and rights of all especially the unborn. In doing this, we shall see that the tears of the unborn children of the last century, the cries of the many victims of wars and genocide, the silent sobs of those who have died through euthanasia and the wailing of the numberless many deprived of justice and peace in this passing millennium, have prepared the ground of a new spring time of the human spirit recreated by the Most Holy Trinity.

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