

# Human Genome Project: The Role and Responsibility of Human Beings Today

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**Abstract:** Human Genome Project unfolds our collective identity as humankind. We progressively seem to acquire more power and greater responsibility. Our collective identity reminds us that all our actions have a profound effect on the environment and on virtually all forms of life. We become stewards of our own Genome and this calls us for greater responsibility. With the discovery of the nature of DNA and the genetic code, a new previously unknown world was opened up that lies within each of us; within the cells of all other living creatures. Insights into all that was considered to be human nature, from disease possibilities to dispositions were poised to enter humankind's collective consciousness. Our explorations of the then unknown world which now have initiated unfolding in and through Genetic Revolution impels us to delve into the anthropic implications of the genome mapping and of the project of being human.

In the middle of the 20th century, Pierre Teilhard de Chardin viewed human beings as "Evolution become conscious of itself." Today in the beginning of the 21st century we can well broaden this understanding as "Evolution become capable of consciously extending or eliminating itself." So too in the reflections ahead, the author probes into the shift that has taken place in our understanding of Human beings as co-creators; Human understanding of God; Human longing for fulfilment; Humans as being at-home in the universe; human capability to affirm life; human urgency to make choices as well as human vocation as trailblazers of self-extinction or self-extension.

After focussing on the unique role and responsibility of humans in the universe of life, the author says that it is the task of the present humanity has to make constant and responsible choices collectively to determine our destiny – to extend or to extinct. In this sense today's human beings are the trailblazers for the whole of life. We have reached the level of consciousness that other living beings can hope for. Either we can foster the evolution in all living creatures or we can wipe out evolution and consequently life itself from earth.

**Keywords:** Enhancement of life; Extinction of life; Evolution; Human choice; Human dignity; Human Genome Project.

“The DNA structure initiated an intellectual revolution that has given us answers to questions that have exercised the human mind since the dawn of reason”. – *Walter Gratzer*<sup>1</sup>

“The further the spiritual evolution of mankind advances, the more certain it seems to me that the path to genuine religiosity does not lie through the fear of life, and the fear of death, and blind faith, but through striving after rational knowledge... My religion consists of a humble admiration of the illimitable superior spirit who reveals himself in the slight details we are able to perceive with our frail and feeble mind.” – *Albert Einstein*<sup>2</sup>

Watson and Crick's model of the structure of DNA opened the door to discovering how genes are copied and passed on from parent to offspring, and how they direct development from embryo to adult. When they discovered the complementary base-pairing of the DNA double helix, Watson and Crick realised that genetic information contained in the sequence of bases could be copied with one strand of DNA forming the template for the making of a new strand. The new information could then be transferred from the nucleus to the cytoplasm to instruct the making of proteins. These 'work houses' make up the architecture of cells and tissues, and carry out vital tasks such as energy uptake and use, hormone synthesis, and sending and receiving messages. Over the next five decades, molecular biologists were elucidating the mechanisms involved to make enormous advances in biology, genetics and medicine. They now have a vast tool kit for manipulating and cloning genes, producing pure proteins on an industrial scale and 'reading' DNA sequences; ultimately to understand the full set of information stored in the 'books of life' - the genomes of entire organisms.

Human Genome Project unfolds our collective identity as humankind. We progressively seem to acquire more power and greater responsibility. Our collective identity reminds us that all our actions have a profound effect on the environment and on virtually all forms of life. We become stewards of our own Genome and this calls us for greater responsibility. With the discovery of the nature of DNA, and the genetic code, a new previously unknown world was opened up that lies within each of us; within the cells of all other living creatures. Insights into all that was considered to be human nature, from disease possibilities to dispositions were poised to enter humankind's collective consciousness. Our explorations of the then unknown world which now have initiated unfolding in and through Genetic Revolution impels me to delve into the anthropic implications of the genome uprising and of the project of being human.

## **1. Humans as Evolution Capable of Extending/ Eliminating Itself**

The technological and moral evolutions have caused a great shift in our understanding of us. In the middle of the 20<sup>th</sup> century, Pierre Teilhard de Chardin viewed human beings as "Evolution become conscious of itself." Today at the beginning of the 21<sup>st</sup> century we can well broaden this understanding as "Evolution become capable of consciously extending or eliminating itself." So too in the reflections ahead, I would like to probe into the shift that has taken place in our understanding of Human beings as co-creators; Human understanding of God; Human longing for fulfilment; Humans as being at-home in the universe; human capability to affirm life; human urgency to make choices as wells as human vocation as trailblazers for self-extinction or self-extension.

## **2. Humans as "Created Co-Creators"**

The Biblical account of creation depicts the creation of human beings in the image and likeness of God, which gives to each individual an intrinsic value. For Christians God as creator implies that the universe of space, time and humanity is dependent on God. Contemporary Christian view holds the position of "Continuing Creation" which affirms God's immanence and participation in the ongoing world. Universe and everything in it moment-by-moment depends on the sustaining activity of God and provides us the faith that we, as men and women, are created in the image of a personal God.

“‘To create’ is a verb describing the origin of novelty in the world through the continuing activity of God. In principle it could occur either as a continuous process susceptible scientifically. Creation with a spontaneous act of God is not describable scientifically. Creation with a capital C refers to a foundational biblical world-view based on faith in God.”<sup>4</sup>

Creativity, which is the central part of human personhood, finds its source within God, the creator who continues His creative activity throughout human history. Reciprocally, humans reflect God in their creativity. God does his creative work through immanent means; the emergence of the new species through the law of genetics is God’s creative work. “Humans are often partners with God in producing what comes to be, “imaging forth” artifacts as God did in creation. God’s initial creation becomes a paradigm for the ongoing creative process in the world.”<sup>5</sup>

In fact, HGP, is the best example and model for such creativity and ingenuity, where humans can truly claim to be “created co-creators.” So we need to explore the complexity of life with wonder and gratitude. “If the ‘glory of God is [hu]man fully alive,” then obviously a human being who more ingenuous and creative gives ‘more’ glory to God. Such humans become the image of God better. Such astounding possibilities make us ‘created-co-creators’ in its most appropriate sense. This implies that the God we believe in is not the ‘God-of-the-gaps’, the God who satisfies one only at the limit-situation of one’s death. We do not need crisis moments to lead us to God. It is the conviction of a genuine believer that God can be found in the depths of the daily lives and not necessarily at the end of daily lives.”<sup>6</sup>

We have an instinctual drive to worship other gods, made of our own *liking*. Only genuine mysticism can free us from our tendency to create gods that suit us, gods in our own likeness. We are prone to fashion gods with our own hands or intellect that fit our own expectations, conveniences and fancies. But God cannot be manipulated by our physical, emotional or intellectual powers. Only when we can bend down before the Ultimate (Other) can we abandon ourselves and in the process foster forgiveness, trust, innovations, fondness and creativity. The HGP and other related developments in the biological sciences could be looked upon as an enhancement of human dignity. It raises humans from the level of mere creatures to that of co-creators or partners in the ongoing process of creation, or ‘created co- creators’.

### 3. Human Longing for Fulfilment

Even as co-creators, humans exist and evolve in a dynamic relationship with the rest of nature. As evolved mammals we are dependent on biological process to sustain our individual and collective lives in spite of our technological abilities. The created world despite being so breathtakingly startling still remains incomplete with almost infinite possibilities for further developments. Humans with their powerful and innovative resources of science are called upon to collaborate in completing the most transcendent task of finding fulfilment by being co-creators.

The HGP emphasises this positive aspect of scientific developments. Scientific developments have led to a paradoxical tension as science reveals more and more the complexity of living beings. Human Genome Project reveals that different species of living organisms are linked to each other intimately. The complexity of our human constitution builds interconnectedness. Human beings have undergone cultural evolution along with biological evolution. Biological evolution is based on the transmission of genetic information encoded in DNA by means of sex cells, while cultural evolution is based on our technological prowess. Therefore human beings are a symbiosis of genes and culture'; physiology and technology.

In such a prevailing scenario, the role of religion is not just to follow the path of science but also to evaluate, guide and shape human explorations and nurture hope for the future. What is called for is creative appreciation, critical guidance, prophetic fostering of life in its totality. Above all such a society and religion has to be a voice for all life forms. Such a society nurtures values, fosters life and promotes community from the awareness that we are all children of God.

Far beyond all these material progress, the deepest human longing for fulfilment is intimately embedded in the cave of our hearts. It is much more than material and is often met in the spiritual realm of encountering the Divine within one's own self and in the other. Moreover, there is a collective search for fulfilment where community is the focal point of encountering the sacred, which is actualised in the community of the faithful, in various human communities. Our holistic search for wholeness affirms our embodiment. Human hope and fulfilment has to begin with this present world, in the 'inaugurated eschatology', in the here and now.

## 4. At-Homeness in the Universe

In spite of the perceptible contradictions and anxiety we feel in this world, religion gives us the certitude that “everything is good.”<sup>10</sup> This feeling good brings in us a sense of being at home in this universe. This feeling of at-homeness stems from our deepest rootedness in the universe and our openness towards our fellow living beings. Being at home, we can safely reach out to all in need from the singularity we experience from our interconnectedness. Without negating a future eschatological vision, but affirming inaugurated eschatology, this sense of belonging urges us to transform this world with deepest commitment, with responsible freedom and fullest hope in the present. “For it is only by putting to death what is old that we are able to come to a newness of life.”<sup>12</sup>

The HGP has provided reliable support to the theory of evolution by reconfirming the view that all living beings have a common origin, have originated from the same primordial stuff. The Genome Project and related developments show this unity in diversity of the living world. Just as atoms of different material elements are made up of the same fundamental particles, the DNA of different beings is made up of the same kind of nucleotides. Even in the sequencing also one can see a remarkable similarity. The prophetic vision of Pierre Teilhard de Chardin sheds light that, “However long it may endure the human world will hence forth only be able to continue to exist by organizing itself evermore tightly upon itself”. We need to uphold the insight that we are earthly beings and the entire cosmos is our habitat.

Ethical and moral issues arising as a spin off from contemporary developments in modern technology can act as trailblazers to evolve policies of fairness and justice, to reflect on and to ensure the well-being of the entire Cosmos. The breakthroughs in the genetic revolution impel us to think what we are and what we want to become. Genetic research, it is hoped, will help us ultimately to unlock the secrets of life processes and understand human destiny. Contemporary theories of evolution have provided us with a new sense of our place in the universe.

## 5. Affirming Life Unconditionally

The more we explore the complexity of life the more we come to realise the complexity of our own make-up. For instance we are beginning to understand genome as the complex distributed system. The cytoplasm and the environment determine even gene expression in the production of proteins. Unfolding of one level of complexity

presents another level of complexity. Human existence is totally dependent on God and is contingent. Even if the genetic advancements can enable human immortality, these human constructions itself entail that human construct necessitates dependency on God who enhances life.

God is the God of the living. The crucial question to pause at this juncture is whether immortality can be identified with eternity; whether human immortality essentially eradicates human suffering and pain; for eternal life implies fullness of life. Hence immortality that the scientific advancements offer does not disqualify ontological dependency on God who is the fullness of life. Moreover Ethical concerns also take precedence with regard to human behaviours in an immortal human society.

Seeking immortality holds credibility both from a scientific perspective as well as from a religious perspective since God affirms life that “I have come that you may have life, life in fullness.”<sup>15</sup> This Human task and responsibility to enhance life can never be substituted as humans ‘playing God’ from the mere fact that though immortals we are dependent on God. We find ourselves often moved to praise God and worship him because of the various affirmations of life in us not from the frustrations that we will die. Future is born from the present and the concerns of the present affirm God in the here and now rather than the concerns of the future which are still beyond our comprehension and are uncertain even if humans becomes immortals.

## **6. From Casual Chance to Creative Choice**

Genetic revolution not only influences what we as human beings want to have, but also what we can become and what we are. This calls for a responsible and careful discernment rather than arriving at ready-made decisions. “Developments like HGP render the situation even more significant and relevant, since they bring in a new and important dimension to this area. Not only does the HGP confirm the main conclusions of evolution, it offers the real possibility of the appearance of a new true *Homo sapiens* species in a much shorter time. This can bring about a serious qualitative change in the status and destiny of humans, involving extremely important, social, ethical and religious implications.”

Advance in genetics presents us with a promise and predicament. The promise is that we may soon be able to treat and prevent a horde of debilitating diseases. The dilemma is that our new found genetic knowledge may also enable us to manipulate our own nature to enhance our muscles, memories and moods; to choose the sex,

height and other genetic traits and to make ourselves “better than well”. Even though immortal human beings may emerge with scientific advancements, the vital elements for our curiosity and quest would be to look into the emotional possibilities of these ‘super-humans’ - their ability to hope for something; to trust in someone; to approach the divine mystery with awe and gratitude.

The larger society has a role to play in determining the future of society and shaping the destiny of life. We might dynamically deny or passively confront the scientific advancement, but this position of blocking all types of progress will only become counter productive in the long run keeping religion and science as opponents to each other.<sup>15</sup> Moreover the inactive, uncritical submission to the dictates of Technology will not lead to true progress and development of human destiny. A scientist has to be one who pays attention to the existential concerns and promote spiritual values and respect ethical norms. And the religious person has to be one who respects scientific technologies without overlooking their social consequences that imply. Further, religions help us to realise that we are not the sole masters of the universe and we cannot take responsibility fully of the chaos and disorder of the universe. We need to turn our hearts towards the power beyond us, then we are in a better position to bring about the Kingdom of God.

Humanity has to make constant and responsible choices collectively to determine our destiny – to extend or to extinguish ourselves. Genetic advancements put before us the need to make decisive choices as we plunge into tomorrow’s horizons throbbing with promises.

## **7. Humans as Trailblazers of Own Extinction/ Extension**

The 21<sup>st</sup> century is full of promises and perils. Genetics and molecular biology are decoding the formulas of life itself. As humans embark upon large-scale genetic engineering of other species and of ourselves, this new pattern of evolution becomes the driving force of the future evolution of the planet. The “struggle of survival” is inherent in nature. Biologists see the emergence and progressive evolution of life as a result of this struggle. Some of the contemporary scholars like Richard Dawkins hold the view that goes to the extent of postulating that life is the quest of “selfish genes” to perpetuate itself.

Unlimited technological progress coupled with rampant moral lethargy seems to be leading us to our own annihilation. We refuse to see the side effects or “collateral damages” of our technological



advancements. The present generation with its scientific dynamism and religious vision, it is hoped, will trace a more authentic and viable cosmic and human future. Our destiny is truly in our hands. The choice is open to us! Standing at the threshold of life – human, animal, vegetative – we can decide for the whole of life, whether to enhance it beautifully or to annihilate it violently! That is a tremendous spiritual responsibility and task!”

Human beings extend ourselves through our cultures, through technological innovations as well as become the cause of our extinction. As well as there is ‘natural’ extinction like diseases, and ‘natural’ extension through the biological productions of natural production. Human made self- extinctions include warfare; genetic manipulations. We can consciously contribute to extend us to the whole of life, which is evolving. “When religion is a quest to communicate with the transcendent and a commitment to balance individual needs with service to others, it brings out the best in others.”<sup>18</sup>

One of the most renowned evolutionary biologists Richard Dawkins has eloquently proclaimed, “Evolution is an enchanted loom of slotting DNA codes, whose evanescent patterns, as they dance their partners through geological deep time, weave a massive database of ancestral wisdom, a digitally coded description of ancestral worlds and what it took to survive in them”. Our explorations of and access to this ancestral wisdom would enable us to have a better explanation of human origins, interconnectedness of human beings within the species, with other forms of life without annihilating ourselves but enhancing our embodiedness.

In this sense today’s human beings are the trail-blazers of the whole of life. They have reached the level of consciousness that other living beings can hope for. Either they can foster evolution in all living creatures or they can wipe out evolution and consequently life itself from earth.

## 9. Conclusion

In this article we have focussed on the unique role and responsibility of humans in the universe of life. Some of our salient findings are:

- The unique role of human beings as created co-creators has endowed them with unparalleled responsibility. Given the fact that humans are also prone to worship idols, we need to strive to use this responsibility cautiously and compassionately.

- Our longing and fulfilment is deeply embedded in the cave of our hearts. Human aspirations and longing will be fulfilled only at the eschatological moment when “every tear will be wiped away.” Genetics alone is inadequate to contribute to such a fulfilment.
- Ethical and moral issues can act as the trail-blazers to evolve policies, to reflect on and to ensure the well-being of the entire cosmos.

It is the task of the present humanity to make constant and responsible choices collectively to determine our destiny – to extend or to extinct (or better, extinguish), to enhance or eliminate ourselves. In this sense today’s human beings are the trail-blazers of the whole of life. We have reached the level of consciousness that other living beings can hope for. Either we can foster the evolution in all living creatures or we can wipe out evolution and consequently life itself from the earth.

## Notes

1. “The Triumph of 1953,” in Julie CLAYTON and Carina DENNIS (eds.) *50 Years of DNA* (New York: Palgrave Macmillan, 2003), 13.
2. See <http://www.healpastlives.com/pastlf/quote/quarelsci.htm>. Accessed on January 2009.
3. Kuruvilla PANDIKATTU, “Collective Extension or Common Extinction: The Challenge of Being Human Today.” In *Rehumanising the Human: Interdisciplinary Essays on Human Person in Context: Festschrift for Dr Jose PanthackalCst*, edited by A Pamplany, 189-210. Bangalore: Asian Trading Corporation, 2006.
4. Richard H. Bube, “Three Views of Creation and Evolution,” in *Expanding Humanity’s Vision of God: New Thoughts on Science and Religion*, (ed.) Robert L. Herrmann (London: Templeton Foundation Press, 2001), 166.
5. Peter G. HELTZEL, “Divine and Artificial Life: A Theological Exploration,” in *Expanding Humanity’s Vision of God: New Thoughts on Science and Religion*, (ed.) Robert L. HERRMANN (London: Templeton Foundation Press, 2001), 231.
6. Kuruvilla PANDIKATTU, “God Among Immortal Humans!,” in *Expanding Humanity’s Vision of God: New Thoughts on Science and Religion*, (ed.) Robert L. Herrmann (London: Templeton Foundation Press, 2001). 221

7. Humans in this age of mastery over nature are not content with conforming to the laws of nature, but want to have a say in determining the destiny of nature. Humans became far more ambitious and aimed at controlling nature along the lines determined by them. They want to go further to become its masters, channelling the resources of nature along their desired paths and selfish motives. Regarding our own contemporary civilization, Toynbee asserts “ we have been God-like in our planned breeding of our domesticated plants and animals, but we have been rabbit like in our unplanned breeding of ourselves.” [Peter G. HELTZEL, “Divine and Artificial Life: A Theological Exploration,” in *Expanding Humanity’s Vision of God: New Thoughts on Science and Religion*, (ed.) Robert L. HERRMANN (London: Templeton Foundation Press, 2001), 231]
8. J.H Brooke speaks of a “god-of-the-gaps” concept where statements of God are used to fill the gaps in scientific explanation assuming that God would fill the gaps in scientific explanations. This assumption presupposes that God acts on the same level as the natural causes. This is objectionable because if such gaps exist, there would have been phenomena that remain unexplainable and mysterious, holes or gaps in the causal nexus. “To worship God as creator is to emphasise both His transcendence over the natural order and His imminence in the natural order.” Therefore a scientist, who is a believer has to encounter a dialectical tension between faith and reason; two intellectual activity, namely science and theology; two communities that is the community of faith and the community of scientific enquiry. He/She has to be awakened to the fact that “all believers of whatever religion have already heard His revealing voice in the discourse of creatures.” [Vatican II Documents, *Gaudium et Spes* 36].
9. More on cultural evolution will be seen in the first section of chapter seven.
10. Genesis 1: 1-9. The essence of the priestly account of creation in the Bible is that everything is created by God as good.
11. An excellent book on this theme is David TOOLAN, *At Home in the Universe* (New York: Orbis Books, 2003).
12. Vatican II document, *Ad Gentes* 8.
13. The Bible, John 10:10.
14. Job KOZHAMTHADAM, “The Human Genome Project and Human Destiny,” *Omega: Indian Journal for Science and Religion* vol 1, no.2 (December 2002), 45.
15. Cf. Kuruvilla PANDIKATTU, “Death of Death: Physical Immortality, Scientific Evidence & Religious Insights,” Kuruvilla PANDIKATTU (ed.), *Human Longing and Fulfillment: East Encounters West* (Pune: Jnana-Deeпа Vidyapeeth, 2002), 216-218.

16. Kuruvilla PANDIKATTU, "Science-Religion Dialogue in India: Creative Challenges and Enabling Possibilities," Kuruvilla PANDIKATTU (ed.) *Together Towards Tomorrow: Interfacing Science and Religion in India* (Pune: Association of Science Society and Religion, 2006), 420.
17. One useful site where information is regularly updated for the dangers of human existence is <http://thebulletin.org/>. Retrieved on April, 2009.
18. Varadaraja V. RAMAN, "The Quest for Unity: Between Science and Religion and among Religions," in *Modern Science, Religion and the Quest For Unity*, (ed.) Job KOZHAMTHADAM (Pune: Association of Science, Society and Religion Publications, 2005), 26.
19. Richard DAWKINS, *Climbing Mount Improbable* (New York: Norton, 1996), 326.
20. These insights are close to Daniel QUINN, *Ishmael* (New York: Bantam/Turner Books, 1992).