2012 International Conference on Environmental, Biomedical and Biotechnology
IPCBEE vol.41 (2012) © (2012) IACSIT Press, Singapore

Genetic Engineering and Sustainable Development: A Philosophical Inquiry

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Abstract. Implied in the quest for sustainable development is the question of protecting human existence. Given that sustainable development entails increasing standards of living without destroying the environment, it is of philosophical concern to ask the question: to what extent is the collection of disciplines called life sciences contributing to the future of human existence? In an attempt to provide answer to this question, among others, the paper attempted an outline of the metaphysical foundations of the life sciences. In an analytic manner and with particular reference to genetic engineering, the paper established the impact of particular developments in the life sciences on human life. The paper suggested a roadmap for sustainable practices in the life sciences.

Keywords: Genetic, Life, Sustainable

1. Introduction

Given the incontestability of the social nature of man, it becomes continually imperative for man to attempt to address questions such as: what kind of being is man? What effect does today's *man* have on the future of man? The last question is of particular interest. Metaphysics, that branch of philosophy concerned with questions about the nature of existence, is characterized by a plethora of theories which attempt to articulate acceptable responses to the fundamental questions of existence Thus, any articulated response to the question of the nature of reality, or the nature of existence is also referred to as *metaphysics.* When understood in this context metaphysics shall be taken to also imply a *world-view*.

One field that has greatly contributed to our understanding of the nature of 'what is' in general, is the sciences (Alioto,1993).[1] Thus science is a kind of metaphysics (Lowe, 2002).[2] It is a metaphysics founded on empiricism; that is the view that knowledge of nature or reality can be acquired through sense experience. Science is in essence a world-view (Fara 2009)[3].

The life sciences is for example situated within that metaphysical framework which attempts to articulate empirical, testable or verifiable responses to the questions of existence (Magner, 2002)[4]. There appear to be a general acceptance by life scientists that the earliest forms of life emerged, on earth, some four billion years ago. The scientific search for the origin of life has also produced the view that life originated from outer space. Paleontologists declare that complex life-forms, such as human life, emerged some 540million years ago. These scientists of life identify biology's 'Big Bang' or the 'CambrianExplosion' which occurred about 540 million years ago as key to understanding the emergence of all forms of life. Thus it becomes obvious that central to the metaphysics of the life sciences is the view that life has a materialist origin.

2. Life Sciences and Genetic Engineering

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Humanity has benefited greatly from the inventions derived from researches in life dciences. For instance, when the Dutch inventor Cornelis Jacobzoon Drebbel (1572-1633), built an efficient incubator for hatching eggs, little did he know that his invention will equally help in preserving and elongating human life. Children born prematurely, among others, have benefited from this invention of science. When placed in the infant incubator, a premature infant is afforded the opportunity of normal growth.

Another break-through in the life sciences is the process of gene therapy. Gene therapy involves the treatment of a genetic disease through the insertion of normal or altered genes into cells in order to replace or make up for the non-functional or missing genes. Thus gene therapy involves the manipulation of gene or genes within cells in order to produce proteins that change the function of those cells (Witherly, 2001)[5].

Geneticists are optimistic that gene therapy provides the ultimate antidotes for the wide range of diseases plaguing humanity. It is believed for example, that gene therapy offers unprecedented opportunities for the treatment, cure, and prevention of cancer and acquired immunodeficiency syndrome (AIDS)[6].

The confidence in the ability of gene therapy to shape the future of medical practice, among others, derives from over forty decades of clinical trials testing the safety and efficacy of this method on humans. These series of clinical trials characterized the 1990s. This explains why, in medical parlance, the 1990s is heralded as the decade of genetics.

The decade of genetics is a remarkable decade for the life sciences. Virtually all forms of life received the attention of geneticists. The decade witnessed the development of that branch of knowledge called genetic engineering. Genetic engineering involves the altering of an organism's genetic, or hereditary material with the aim of eliminating undesirable characteristics or producing desirable new ones. Immediate benefits of this fast-growing gene enterprise are multi-faceted (Waston, 2003)[7].

Thus, with genetic engineering, argues advocates of this life altering technology, it is possible for man to take his own evolution in his hands. It is possible for man, through manipulation of genes to eliminate genetic diseases within a shorter period than the process of natural selection would have achieved in centuries.

The economy, it is argued, also stands to gain from the scientific project of maneuvering genes. Genetics is an industry for good investment. It is an industry without boundary. The products of genetics impact on many industries. Thus genetics has the possibility of boosting global economy and gross domestic products. For example, the eventual emergence of designer plants and designer animals, among others will bring about the need to establish Gene Banks for transnational transactions in genes.

In the social sphere, genetic engineering provides families with the opportunity of influencing the predisposition of would-be offspring(s). A family that has a reputation for producing social misfits could for example, pre-natally or post-natally insert into their babies, genes that will predispose them to acquiring desirable traits like higher intelligence and effective social skills. Families are, in the ultimate afforded a wide range of 'designer babies' to choose from. The totality of humanity is also afforded the opportunity of being freed from the plague of genetic disease and dangerous genetic legacies.

3. A Roadmap for the Life Sciences and Sustainable Development

While the exponential potentials of genetic engineering cannot but be acknowledged, it is only reasonable to raise a number of pertinent philosophical questions: is it ethical to manipulate genes? Is it inconceivable that man abuses genetic engineering? Will genetic engineering not limit the human gene pool? What if genetic engineering incidentally produce unkown harmful consequences that man is not prepared for? Would the possibility of genetic enhancement not deepen social

inequalities (for instance, the rich getting genetically richer children and the poor getting poorer children)? (Wilkie, 1994)[8].

The list of imaginable questions is endless: is it rational for governments to spend tax- payers monies on projects that will place their nations in the 'genetic engineering race'? Is it not possible that in future geneticists would seek to own the patents of their products leading to patented plants, patented animals and possibly, patented human beings? Could it not be that the whole enterprise of creating genetically altered humans is lucrative business for investors who see the prospects of making money from drugs that make altered *human life* work? Finally, on a philosophical note: in the light of the quest for sustainable development, ought humanity pursue genetically engineered evolution?

The United Nations World Commission on Resources and Development takes *sustainable development* to mean development that meets the needs of the present without compromising future generation. Discourses on the idea of *sustainable development* ake the idea to imply being environment friendly and preserving a safe, clean and habitable environment for future generations.

By extension sustainable development, should see the preservation of human life itself, in its purest and natural form, as fundamental to any other form of preservation that could be imagined. What makes a particular life form human is not simply cellular or molecular. Human life is not simply conceived in materialist terms. Human life is essentially social. Human life is a unique form of *bio*. Just as the greek word *bio* refers to life, it also refers to a way of living. The human life is a way of living that has evolved over the years as a result of shared values. For as long as it is impossible for science to genetically alter socially shared values like justice, kindness and trust, genetically engineered lives portends a dangerous development[9].

The emergent genetic engineering industry appears to suggest that the future of human life is being compromised at the altar of meeting the needs of a privileged few in the present generation: the genetic researcher who shows how human life could be further tinkered, and the industrialist who invests in the research. The economic prospects of research and investment in genetic engineering are enormous: patent rights to manufacture designer *life*; patent rights to produce the drugs that keep the designer life working; patent rights to produce a category of humans who will work tirelessly and displace genetically unaltered humans form the labor market.

At this juncture, a thought experiment may be suggested. Imagine a community dominated by genetically engineered humans: the few genetically pure and un-engineered humans are seen by the majority as inferior and old-fashioned; the genetically pure and un-engineered humans gradually go into extinction in the face of the now prevailing sense of 'survival of the fittest'; the few surviving genetically pure and un-engineered humans are possibly arrested and preserved in the zoos, in order to amuse future generations of bio-chemically altered humans.

Recent researches in the life sciences and in genetic engineering in particular, appear to suggest a re-definition of life along rather very narrow and precarious lines that put human life, in particular, under threat. Fundamental to a viable roadmap for acceptable practice in the life sciences is the need to effectively regulate researches in all of the disciplines called the life sciences. Governmental regulation and international monitoring of clinical tests conducted by life scientists will check the invention of potential tools of human destruction.

There is also the need for the creation of mass awareness about discoveries in the life sciences. Not many are aware of the benefits of the findings in the life sciences. Still, a larger number of people are ignorant about the risks involved in the on-going researches in laboratories around the world.

The convergence of the researches in the plant, biological and chemical sciences, among others, impact on *life* and the question of existence. Excessive tinkering of *life* could have devastating effects on humanity. An ecological imbalance could result from continued and uncontrolled fiddling with the very basis of life, deoxyribonucleic acids (DNAs)[10]. Thus an uninformed public about genetic engineering or DNA Technology puts itself at the risk of genetic extinction.

4. Conclusion

Derivable from the above inquiry is the desideratum to equip life scientists with the requisite analytic skills for assessing the possible impact of life science practices on man. A compulsory study in *Life Science Ethics* would afford the life scientists the needed philosophical platform for assessing the morality of the beliefs and practices of the life sciences vis-à-vis the question of the survival of man. This way, we sustain a symbiotic relationship between the life sciences and the quest for sustainable development.

5. References

[1] A. Alioto. 1993 *A History of Western Science* 2nd ed London: Prentice Hall pp12 – 14

[2] J. Lowe. 2002, *A Survey of Metaphysics* Oxford: Oxford University Press. pp12-14

[3] P. Fara. 2009 *Science: A Four Thousand Year History*. Oxford: Oxford University Press. pp1- 22

[4] L. Magner. 2002 *A History of the Life Sciences: Revised and Expanded* New York: CRC Press

[5] J. Witherly (et. al.) *An A to Z of DNA Science: What Scientists Mean When They Talk About Genes and Genomes* Cold Spring Harbor Laboratory Press, 2001.

[6] A. Amodu, 'Technology and Social Existence: A Philosophical Shaping of the Future' in Ayo Fadahunsi ed. *Philosophy, Science and Technology* Ibadan: Hope Publications 2003. p.20

[7] J. Waston, and B. Andrew. *DNA: The Secret of Life* Knopt, 2003.

[8] T. Wilkie. *Perilous Knowledge: The Human Genome Project and Its Implications* California: University of California Press, 1994.

[9] A. Caplan. *Moral Matters: Ethical Issues in Medicine and the Life Sciences* Texas: Wiley Press, 1995.

[10] K. Drlica *Understanding DNA and Gene Cloning: A Guide for the Curious* 4th ed. Wiley, 2003.