

## Lecture: 32

### Course Title: Science, Technology and Society

#### A philosophical assessment

##### Re-defining humans?

It raises the philosophical question, 'in genetic terms what it is to be human?' Genetic engineering raises issues about the nature of life itself, about what it is to be human, about the future of human race and about our rights to knowledge and privacy. "Until now we have all been children of nature, the progeny of evolution".<sup>1</sup> We were neither designers of the flora or the fauna, nor responsible for the being of man or of nature. With genetic engineering at our doorstep, we are not only physicians and healers acting midwife to assist birth, we are basically active manipulators and skillful surgeons with sophistication and excellence. On the other hand, this biological turn in our thinking could take a positive turn with its due recognition of man's historical and situational limitations. Unlike other homothetic society of sciences, a product like physics, chemistry, and mineralogy, and geology etc., biology is idiographic to Earth. We can expect only on this Earth historically derived genes and their Earthly generated products. A human designer can only narrate the story of these particular and historical genes.

One of the most significant changes within the twentieth century and early decades of the twenty-first century is the development of our ability to manipulate life through genetic engineering. Biotic artifacts imply that non-humans are neither 'for themselves' nor 'by themselves'. Humans now have re-coded the internal design of these biotic entities; the formal cause is already taken over. Biotic entity may continue to exist for itself, provided humans allow them to exist the way they should, following their respective trajectories, independently of human interests and intervention.

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It is significant that nature has only instrumental value for humans. Even for Bergson, it is even more significant that human consciousness and intelligence, as embodied in instrumentation and manufacture as well as the scientific reasoning, which stands behind these, so effectively breaks down any recalcitrance and resistance of non-human nature against the penetration and imposition of human intentions upon it. In other words, the transformation of the natural into the artifact truly affirms humanity's mastery of nature. *Homo Faber* reigns supreme.

With genetic engineering, organisms that produce asexually can have genetic material spliced into their genes from individuals other than themselves. The same holds also for those that reproduce sexually. Animals, on the other hand, reproduce sexually, while

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<sup>1</sup> Ralston, Home S. *Gene, Genes and God*. Cambridge: Cambridge University Press, 1999.

some plants reproduce asexually. That means that under genetic engineering a major difference between some plants and most animals can be obliterated. Science promises to achieve in overnight laboratories the process of natural selection, which would otherwise take millions of years in nature. Research predicts that, one-day, geneticists may be able to remove traits from human beings that are considered undesirable and replace them with more acceptable ones. However, that is in our future. Currently, the battle is to be able to freely and legally complete the research that will eventually lead to this kind of genetic engineering of humans.

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Now that we come close to such an understanding, greater progress becomes possible. Embryology is a science of tomorrow. This is a shift from holistic to atomic conceptions of man and of nature; the shift from the macro to the micro, from organizations to un-connected atoms. Biotechnology has therefore tempted many to consider putting right what they perceive to be severe limitations in nature itself. One such limitation, which ‘designer proteins’ and transgenic organism hope to overcome, is that natural evolution can capitalize errors during DNA replication. Furthermore natural evolution necessarily is a slow process, favoring those individual organisms with mutations, which bestow an advantage on their possessors’ Like Tudge, these thinkers are eager to ‘help’ nature during anticipated periods of extreme atmospheric or ecological stress when the necessary random mutation may not be forthcoming’.<sup>2</sup>Others, such as Easter Brook, go even further to talk about overcoming ‘design flaws’ in nature, replacing nature with ‘New Nature’. For instance, the ‘New Nature’ envisaged is one in which predation by animals against animals would have been eliminated. Modern civilization holds it to be axiomatically correct that pain is an absolute evil, and the removal (or diminution) of pain an absolute good. That amounts to re-designing the existing biosphere in which carnivores operate at the top of the food chains to an entirely herbivores biosphere. That amounts to humanizing nature with a vengeance.

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In this journey of man as contemplator to man as *Homo Faber*, both the one who designs and the one which is designed, has undergone change. Natural evolution is in danger of being superseded by human control and manipulation of biotic nature. Instead of natural selection, it is now possible to have human selection of characteristics deemed to be desirable to be spliced into the genomes of different life forms. Biotechnology makes it possible (at least in principle) for *Homo Faber* to rearrange genetic material in ways, which please it. Organisms no longer inherit genetic material that can even come from other unrelated species. Their genetic composition can be humanly designed and engineered in the laboratory. This may marginalize the gap between natural man and his image, the biotic artifact, between man and his replica, the similar other.’ Robert Sinsheimer, a leading molecular biologist and a key figure in the initiative to establish the

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<sup>2</sup> J.Lee, Keekok, *Philosophy and Revolutions in Genetics*. New York: Macmillan, 2003.

project, wrote in 1969: “For the first time, a living creature understands its origin and can undertake to design its future”.<sup>3</sup>

### **Re-designing humans?**

We should pose the basic question: 'in genetic terms, what makes us human?' This is now synonym to, 'what actually specifies the human organism?' Molecular biologists have estimated that there are 100,000 to 30,000 genes, which make up a human being. The lower estimate assumes about 30,000 base pairs per gene; but as some genes may only be 10,000 base pairs long, there could be as many as 300,00 genes, according to the highest estimate. That means that the human DNA sequence is composed of three billion base pairs.

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But whatever the estimate of the number of genes, the number alone underestimates the complexity of the human organism, because many genes encode ten to twenty different functions in different issues. Some of that genetic inheritance may turn out to be unwelcome- for instance, Tay- Sachs disease is a common disorder among some groups of Ashkenazi Jews in North America who, through many generations of marrying within the groups, have increased the chances of their offspring inheriting the deleterious gene from both parents, who might each be a heterozygous Tay- Sachs carrier. The therapeutic aspect of gene-technology is always welcome but there are other exciting possibilities that ask for human restraint and in- depth understanding of a holistic picture of man and his interconnections with things and beings around him than a simple identification of defective genes.

In this journey from contemplation to manipulation, what is left behind in this process is the spiritual realm that gave rise to holistic vision of man and his counterparts. With his piecemeal knowledge and his fascination for details, man has lost that sense of wonder to celebrate life as a gift. This needs recognition of the dreamer and the planner, along with the skilled artisan and the craftsman and his practical know how. Or else, either the technical man is transformed completely to the man of technology who will solve life or death problems in the same spirit that solves a problem in mathematics.

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<sup>3</sup> Lee, Keekok, *Philosophy and Revolutions in Genetics* .New York: Macmillan, 2003

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Life has lost its mystery and its sacredness, as birth is no longer a mystery, nor is death. Now the human story and the Earth story is found to be simply coded in genes in complete ignorance of the fact that this Earth story cannot be only that which is simply coded in man's genes. Even genes, as they spin a natural history that they also record, are placed in larger events of climate, geomorphology, or marine hydrology. The story takes place at multiple levels, of which the microscopic genes are only one, the level of smallest scale." There are, on smaller scales still, atoms, electrons, quarks, on which the story motifs are superimposed, but we do not know of any cybernetically transmitted accumulating historical coding, that is registered in structures and processes at these lower levels. There are, on larger scales the native range events with which the phenotype must reckon, the blooming, buzzing confusion of life on land and in the sea." <sup>4</sup>This gene-story cannot take account of the cultural and the spiritual realm of man .It has no explanation to the fact that in culture, people can act in ways that decreases their fitness. The self is not simply biological and somatic but cultural and ideological. Along with biological reproduction, there is cultural reproduction of what one values most .That is equally required since humankind has relied, in the main (and still does), on cultural means to regulate and determine human reproduction. "Once the cultural selection is in place, the only technique relied on is copulation, helped in some instances by subsidiary techniques, which vary from culture to culture, like eating the right foods, or saying the right prayers in the hope that there would be success in conception and that then offspring turn out to have certain desired values ". <sup>5</sup>

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We may once again distinguish here the processes of techniques from technologies, reproduction from human production, and man as cultural from man as natural as well as man viewed from holistic perspective to the atomic and microscopic picture of man. This is also a shift from the joy of creativity to the mechanical act of manufacturing humans in a factory. This technological manner of human making process can be compared to as artificial a process as cake –making." The formal cause and the material cause appear to lie within the union of a particular sperm and particular egg to form the embryo, which develops into the infant born nine month later. The production, unlike the reproduction of human offspring, literally involves the making of babies. Such babies, like cakes, are true artifacts except that one is biotic and human, whereas the other is a- biotic. 'The supersession (in principle) of reproduction by production even in the context of human reproduction is the true measure of the ontological transformation humankind has

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<sup>4</sup> Lee, Keekok, *Philosophy and Revolutions in Genetics* .New York: Macmillan, 2003

<sup>5</sup> Ralston, Home S, *Gene, Genes and God*. Cambridge: Cambridge University Press, 1999.

effected, and the extent to which it has not only humanized nature but in the process, using the same technologies, has also naturalized humanity itself”.<sup>6</sup>

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- <sup>6</sup> Ralston, Home *Genes, Genesis and God* (Cambridge University Press, 1999)  
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