

Lecture: 34

Course Title: Science, Technology and Society

Biotechnology – Implications for the Meanings of Life and Life Processes

STS on Biotechnology and its Implications for the Meanings of Life and Life Processes

Expressing concerns the relationship between determinism and control, they accept the fact that , arguments against genetic modification expound on moral problems that can arise when one attempts to control human traits. But it does not hold:”However, individual traits, just as events in the world, may remain beyond human control despite being strongly determined. For example, the collision of an asteroid with the Earth is determined by the size, velocity, and orbit of both celestial bodies, along with certain other conditions. However, despite our knowledge of these factors, we will remain unable to prevent such a collision unless and until human ingenuity and technology enable the successful manipulation of these causal factors.

A similar situation is not hard to envision with respect to human biology and genetics: a trait might be strongly genetically determined but, nevertheless, remain beyond our control as the result of either its complexity, including its interactions with the environment, or our own lack of scientific and technological ability. Suppose that intelligence proves strongly genetically determined but that there are over two hundred different separate genes involved in the expression of this trait. The sheer complexity necessarily entailed by hundreds of interrelated genes might, in this hypothetical scenario, hinder and forever frustrate our attempts to control or modify intelligence by way of genetic manipulation. “¹Besides, as shown by authors of *The Inevitability of Genetic Enhancement Technologies*. *Bioethics*, since genes often produce more than one phenotypic effect (a condition known as pleiotropy), we may find it difficult to maximize intelligence without simultaneously causing adverse affects, such as anxiety and aggression.”²

Some of the usual arguments against genetic modification are the following :

Since the 1970s, scholars have developed a variety of arguments against genetic modification of human beings which can be divided into two basic types: consequentialist and non-consequentialist. The non-consequentialist argument, that genetic modification is inherently wrong, is logically different from the consequentialist argument that it is wrong because it produces its consequences. The non-consequentialist who believes that

¹ QUOTED IN ¹ David B Resnik and Daniel B Vorhaus ,*Philosophy Ethics and Humanities in Medicine* (2006) Volume: 1, Issue: 1, Publisher: BioMed Central, Pages, <http://www.peh-med.com/content/1/1/9>

² ibid

genetic modification is inherently wrong is likely to favor a total ban on it whereas the consequentialist will be willing, at least in certain circumstances, to legalize and to regulate it.

“Consequentialist arguments assert that the negative consequences of genetic modification far outweigh any benefits that may occur. These may include harms to children and to future generations; loss of biological or cultural diversity; economic costs; and the degradation of social values such as acceptance of disabled people, respect for the value of human life, and equality of opportunity. Non-consequentialist arguments claim that there is something *inherently* wrong with genetic modification of human beings: genetic modification would still be wrong even if the good consequences of modification outweighed the bad. With this distinction clearly in mind we turn now to examine four of the most influential non-consequentialist arguments: the freedom argument, the giftedness argument, the authenticity argument, and the uniqueness argument.”³

Genetic modification and human freedom

The freedom argument claims that genetic modification interferes with the ability of the modified human being to make free choices. The freedom argument can be understood in three different ways:” (a) Genetic modification prevents that person who has been modified from making free choices related to the modified trait. The modifier controls the person's future by controlling his/her genes. If you have been given a gene for musical talent, you have no choice but to become a musician. We will call this the Puppet Critique.”¹¹

The other arguments are : (b) Genetic modification limits the options of the person who is modified by limiting their range of behaviors and life plans. A person with a gene that causes him/her to grow to a height of seven feet cannot become a jockey. We will call this the Open Future Critique.

(c) Genetic modification interferes with the person's ability to make free choices by increasing parental expectations and demands. A person with a gene for musical talent will face enormous pressure to become a musician. We will call this the Parental Expectations Critique.”All three of these critiques can be covered by the broader umbrella argument that genetic modification interferes with the freedom of the modified individual, rest heavily upon unsupportable assumptions of genetic determinism”,¹² Resnik and Daniel B Vorhaus comment.⁴

³ ibid

⁴ QUOTED IN ⁴ David B Resnik and Daniel B Vorhaus ,*Philosophy Ethics and Humanities in Medicine* (2006) Volume: 1, Issue: 1, Publisher: BioMed Central, Pages, <http://www.peh-med.com/content/1/1/9>

To quote Resnik and Daniel B Vorhaus once again: “However the so called “The Puppet Critique” assumes strong forms of genetic and psychological determinism. As ...comment : “For this argument to work, one must assume that the gene strongly determines the development of a particular behavioral trait and that the person will be unable to avoid expressing that trait. The modified person with a gene for musical ability will have no choice but to develop this ability to its fullest extent: he or she will become a professional musician. Kass develops this sort of argument in his critique of human cloning:

The child is given a genotype that has already lived, with full expectation that this blueprint of a past life ought to be controlling of the life that is to come. Cloning is inherently despotic, for it seeks to make one's children (or someone else's children) after one's own image (or an image of one's choosing) and their future according to one's will. In some cases, the despotism may be mild and benevolent. In other cases, it will be mischievous and downright tyrannical. But despotism – the control of another through one's will – it inevitably will be’⁵

They argue that this type of argument, the cloner as the despotic puppet-master, is highly problematic because, as previously discussed, it relies on dubious biological and psychological assumptions. They argue in this way:” First, contrary to Kass's implication, exerting control over a child's genotype does not give one despotic control to shape "their future according to one's will." Both environmental and developmental factors *must* be considered. A person with a gene for musical ability may not develop this ability if he/she loses his/her hearing as a result of childhood illness, is not exposed to music at an appropriate time, or is not afforded the chance to play and to practice an instrument. To seek the sort of despotism that Kass has in mind – "to make one's own children...after one's own image" – will require more than just a reproductive decision; it will require a lifelong commitment.”⁶

“Even more problematic for the Puppet Critique is the assumption of psychological determinism, as the individual might decide not to pursue a modified trait to its fullest extent. The most genetically gifted musician might nevertheless forgo a career as a musician or a composer, favoring life as an accountant or attorney instead. Indeed, the person might even come to share Kass' dismal opinion of cloning, and rebel against what his/her parents believed was a genetic gift for that or any number of more benign reasons .⁷ At its most basic level, the Puppet Critique relies on misstatements of scientific reality, and plays on the public's worst fears about the powers of genetics “. ⁸

Regarding the fear that genetic modification treats children as products to be designed, perfected, manipulated, and controlled, that children are no longer viewed as gifts, but as

⁵ ibid

⁶ ibid

⁷ Weinberger J. What's at the Bottom of the Slippery Slope: A Post-Human Future? *Perspectives on Political Science*. 2003;**32**:86–93.

⁸ ibid

commodities., the authors observe that these concerns show that the” problem is not the drift to mechanism but the drive to mastery. And what the drive to mastery misses and may even destroy is an appreciation of the gifted character of human powers and achievements...The problem is not that parents usurp the autonomy of a child they design. The problem lies in the hubris of the designing parents, in their drive to master the mystery of birth .⁹The problem with genetic enhancement, according to this argument, is that it gives parents too much control over the traits of their children. In another common articulation of this critique, parents and others supporting genetic modification are accused of desiring to "play God", and of designing children to fulfill their own desires.¹⁰

On the whole, although alternative consequentialist arguments tend to support the view that though genetic modification may not be inherently immoral, the morality of genetic modification depends on its implementation and its use by individuals and society, and on the consequences produced therein.

Science, Technology, and Social Movements

As the STS field has paid increasing attention to the problem of how to make our research relevant to the pressing ethical and policy issues of the day, researchers have examined how democratic participation in science and technology can be enhanced (e.g., Fischer, 2000, science, 1995; Wynne, 1996). ¹¹Social movements are one of the main pathways toward increased democratic participation, and consequently their study has come to occupy increasing attention among STS researchers. Social movements enhance public participation in scientific and technical decision-making, encourage inclusion of popular perspectives even in specialized fields, and contribute to changes in the policy-making process that favor greater participation from nongovernmental organizations and citizens generally.

MAPPINGS OF SCIENCE, TECHNOLOGY, AND SOCIAL MOVEMENT

The triangle of science, technology, and social movement can be mapped according to the locus of change. One locus of change involves reform movements or counter-movements within scientific fields (Nowotny & Rose, 1979). ¹²Science is rarely characterized by a Kuhnian paradigm (Fuller, 2000); instead, researchers tend to be organized in networks that compete with each other for control of resources such as

⁹ .” Sandel M. The case against perfection. *The Atlantic Monthly*. 2004;**April**:51–61.

¹⁰ *ibid*

¹¹ Wynne, B. (1996) May the sheep safely graze? A reflexive view of the expert-lay knowledge divide. In Lash, S., Szerszynski, B. & Wynne, B. (eds.) *Risk, Environment and Modernity. Towards a New Ecology*. Sage, London, 44–83.

¹² Nowotny, H., and H. Rose. 1979. *Counter-movements in the sciences*. Dordrecht, the Netherlands: D. Reidel.

funding, major academic departments, and professional associations and journals. Much of the history of science documents those struggles and the displacement of one network by another, and the sociology of science has also studied such processes through research on specialty group formation (Mullins, 1972) and the dynamics of actor-networks in science (Latour, 1988).