

Human Enhancement

Scientific, Ethical and Theological
Aspects from a European Perspective



Published by the Church & Society Commission
of the Conference of European Churches

Edited by Theo Boer and Richard Fischer

Published by the Church and Society Commission
of the Conference of European Churches,
edited by Theo Boer and Richard Fischer

ISBN: 2-88070-132-5

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TABLE OF CONTENTS

PREFACE

Rüdiger Noll and Richard Fischer	4
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INSTITUTIONS

1. HUMAN ENHANCEMENT: A POLICY PERSPECTIVE FOR THE EUROPEAN UNION Ruud ter Meulen	9
2. TOWARDS INTERNATIONAL REGULATION OF NEUROENHANCEMENT IS THERE A ROLE FOR HUMAN RIGHTS? Doris Wolfslehner	25

SCIENCE AND MEDICINE

3. I DON'T WANT COMFORT, I WANT GOD, I WANT POETRY, I WANT REAL DANGER Theo Boer and Cees Dekker	33
4. HUMAN ENHANCEMENT Christopher Coenen	57
5. STAYING HUMAN IN THE 21 ST CENTURY THINKING BEYOND HUMAN ENHANCEMENT TECHNOLOGIES INSIDE THE BODY Rinie van Est and Mirjam Schuijff	81
6. DEEP BRAIN STIMULATION AND ENHANCEMENT Henriette Krug	97
7. THE HUMAN BODY AS CULTURAL PLAYGROUND WITH EMPHASIS ON THE FEMALE BODY Marianne Springer-Kremser	109

ETHICS AND THEOLOGY

8. HUMAN ENHANCEMENT FROM THE ORTHODOX POINT OF VIEW Stavros Baloyannis	119
9. AN ISLAMIC VIEWPOINT ON THE 'PERFECTIBILITY' OF THE HUMAN BEING Omar van den Broeck	129

10.	REFLECTIONS ON TEN YEARS OF HUMAN ENHANCEMENT DEBATE Donald Bruce.....	133
11.	CONTEXTUALISING ENHANCEMENT: RELIGIOUS AND ETHICAL ASPECTS FROM A EUROPEAN PERSPECTIVE Peter Dabrock.....	155
12.	WHAT CAN WE LEARN FROM THOSE WHO HAVE GONE BEFORE? Emmanuel of France.....	171
13.	SCIENCE, VALUES AND JUDAISM Albert Guigui.....	177
14.	DRAWING THE LINE AND EXPRESSING THE DILEMMA IN CORRECTIVE OR PLASTIC SURGERY Anestis Keselopoulos.....	183
15.	ETHICAL ASSESSMENTS AND IMPLICIT IMAGES OF HUMANHOOD FROM A THEOLOGICAL PERSPECTIVE Ulrich Körtner.....	193
16.	PROTESTANT PERSPECTIVES ON HUMAN ENHANCEMENT Brendan McCarthy.....	217
17.	HUMAN ENHANCEMENT AND SCIENCE: THE IDEA OF PROGRESS RE-VISITED Janne Nikkinen.....	223
18.	ON THE PROSPECTS FOR HUMAN ENHANCEMENT Maria Pilar Nuñez Cubero (COMECE).....	235
19.	RETURN TO THE GARDEN OF EDEN (ESSAY ON POSTMODERNISTIC THEOLOGY) David Perović.....	245
20.	BETWEEN MERE OPPOSITION AND DULL ALLEGIANCE ENHANCEMENT IN THEOLOGICAL ETHICAL PERSPECTIVE Stefanie Schardien.....	249
21.	HUMAN ENHANCEMENT AND THEOLOGICAL PERSPECTIVES Ulla Schmidt.....	261

22. HUMAN ENHANCEMENT BETWEEN THEOSIS AND KOINONIA AN ORTHODOX PERSPECTIVE Stefan Stratul and Constantin Jinga.....	273
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CONCLUDING REFLECTIONS

23. REFLECTIONS ON ENHANCEMENT AND ENCHANTMENT A CONCLUDING ESSAY Theo Boer.....	283
--	-----

BIOGRAPHIES OF THE CONTRIBUTORS.....	293
--------------------------------------	-----

ACKNOWLEDGEMENTS.....	298
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PREFACE

Churches Engaging in the Controversial Debate on Human Enhancement

For ages, humans have developed cures for diseases and devised techniques which make the hardships of life more endurable. All these were believed to make human life more humane, i.e. to help humans to live out their inherent (natural, God-given) potentiality to a fuller extent. Recent technology, known as *human enhancement*, challenges this 'natural' normativity: going beyond restoring wellbeing and optimizing human potentiality, enhancement also develops capacities which can, in a sense, be called new. Chemicals have become available that increase physical performance in, for example the field of sports. Other chemicals enhance psychological endurance, mood, and cognition. Work is in progress on developing functional implants within the body, such as computer chips integrated in the brain, with the aim of enhancing performance beyond what humans are naturally capable of. Changes are being made to body cells and systems, and techniques are being discussed to change human genes. Finally, techniques are being developed, and in part already applied, which extend the human life-span. Human Enhancement is about trying to make changes to minds and bodies – to characteristics, abilities, emotions and capacities – beyond what we currently regard as normal.

The questions that arise are many. Which part of the manifold claims and ambitions of scientists will prove to be feasible and which will not go beyond the stage of science fiction? Will it be possible to make humans better in one respect without causing damage to other capacities – physical, mental, moral, spiritual? Does a communitarian approach to human life and human relationships yield a different assessment of human enhancement compared with a more individualistic one? Given the expected costs of enhancing techniques, what will the consequences be for the availability of other forms of expensive medical and technical assistance? Will techniques for enhancing human beings yield a new species, and if so, what will be the relationship between the 'new' species and the 'old'? Will enhancement jeopardize or increase solidarity within the human race? And what happens to human self-understanding and religious piety when human life is seen as the object of a technical project rather than as the result of evolution or Divine creation?

Europe, Churches and Human Enhancement

Europe has been something of a forerunner in establishing a structured way for dealing properly with human rights and ethical issues linked to the spectacular developments in science, technology and biomedicine since the 1950s. This is thanks to the work of governments in Europe and international political organisations such as the Council of Europe, based in Strasbourg, France (with 47 member states). Churches and their international organisations like the Conference of European Churches (CEC) have also contributed to this work.

Through its Church and Society Commission (CSC), the Conference of European Churches (CEC) has a long-standing record of excellent in-depth reflection on issues of bioethics and biotechnology. This dates back to 1993, when the predecessor body of CSC, the European Ecumenical Commission for Church and Society (EECCS), established its first Working Group on Bioethics and Biotechnology. In 1997, in recognition of the quality and the substantial nature of the contacts and the oral and written contributions made through this Working Group, the Steering Committee for Bioethics decided to admit EECCS (and subsequently CSC of CEC), as an Observer member. This enabled us to participate fully, except for the right to vote, in its plenary meetings. Ever since, CEC has maintained bioethics and biotechnology as one of its priorities in its dialogue with the Council of Europe (CoE) and the Institutions of the European Union (EU) on key challenges for society, ethics and theology (cf <http://csc.ceceurope.org/issues/ethics-science-and-technology/>).

The work of CEC in general, and of CSC in particular, is deeply rooted in the *Charta Oecumenica*, signed jointly by CEC and the (Roman Catholic) Council of European Bishops' Conferences in 2001 in Strasbourg. It declares: "Churches support an integration of the European continent. Without common values, unity cannot endure. We are convinced that the spiritual heritage of Christianity constitutes an empowering source of inspiration and enrichment for Europe. On the basis of our Christian faith, we work towards a humane, socially conscious Europe, in which human rights and the basic values of peace, justice, freedom, tolerance, participation and solidarity prevail. We likewise insist on the reverence for life, the value of marriage and the family, the preferential option for the poor, the readiness to forgive, and in all things compassion." (III.7)

The EU Institutions have steadily included more and more explicitly the ethical dimension in their approaches and policies. This has been done in two complementary ways:

1. In the Treaties, the EU is declared to be founded on the same values and principles as the Council of Europe. Article 2 of the Treaty of the EU states: "The Union is founded on the values of respect for human dignity, liberty, democracy, equality, the rule of law and respect for human rights. These values are common to the Member States in a society

of pluralism, tolerance, justice, solidarity and non-discrimination.”

2. Regarding Science, Technology and Ethics, the binding EU Charter of Fundamental Rights mentions in several articles the importance of protecting human dignity (Art. 1), human rights in the “fields of medicine and biology” (Art. 3), data protection (Art 8), rights of the elderly (Art. 25) and of persons with disabilities (Art. 26). Article 13 states however “The arts and scientific research shall be free of constraint.” Article 6 of the *Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013)* is about ethical principles. It starts by stating: “All the research activities carried out under the Seventh Framework Programme shall be carried out in compliance with fundamental ethical principles.”

The CoE was the first international organisation to prepare a binding international agreement addressing the new biomedical technologies: the *Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine* opened for signature on 4 April 1997 in Oviedo, Spain. By the end of 2011, twenty-nine member states had ratified the Convention, which has now come into force for these countries. The Convention was preceded by many debates and recommendations at intergovernmental level. It has been supplemented by a series of specific Additional Protocols: on the Prohibition of Cloning Human Beings, on Transplantation of Organs and Tissues of Human Origin, on Biomedical Research, on Genetic Testing for Health Purposes. Current Council of Europe work in this area concerns: the decision-making process in the field of medical treatment in end-of-life situations, the protection of the human rights and dignity of persons with mental disorders, and prenatal sex selection. In the near future, the Council of Europe may move on to study the issue of emerging technologies in the biomedical field and neurosciences, a field which is connected with the much broader area covered by the somewhat ill-defined term ‘human enhancement’.

Article 2 of the Oviedo Convention, entitled “Primacy of the human being”, states: “The interests and welfare of the human being shall prevail over the sole interest of society or science”. There may here be more than a nuance when compared with Article 13 of the EU Charter of Fundamental Rights (quoted above). This may be a potential source of tension in particular situations, when states seek to comply with both European binding instruments. Therefore it is very much to be welcomed that cooperation between the EU and the Council of Europe is increasing.

It is said that ethics is always one step behind scientific and technological developments. Over the years, members of the Working Groups of EECCS, and then CSC, often had this

impression. This time, however, when starting to consider the very broad field covered by 'Human Enhancement', we have made a determined effort to anticipate developments which may (or may not) come to pass in the future. The topic of nanotechnologies and converging technologies has more and more been entering public awareness, on national as well as on Council of Europe and EU level. It is also becoming clear that such prospects tend to elicit (sometimes very strongly) conflicting views as to how they should be evaluated and judged. Years later, the same controversies remain, as is shown in some of the following chapters. The very decision to deal with the issue of human enhancement (at least in the way we did) has been, and still is, contested. Nevertheless, a broad consensus formed the basis for the decision to update and deepen our understanding of the real challenges for human beings which are posed by human enhancement. These challenges impinge on the principles of life in dignity, freedom and solidarity, reverence for life and compassion, and respect for the human rights of all, particularly those of the most vulnerable in all societies, together with the rights of future generations.

The CSC of CEC Conference on Human Enhancement

This is why the CSC of CEC decided it was a priority to convene a broad consultation on the issue. This was done from 25 to 27 April 2012, under the auspices of the Secretary General of the Council of Europe, Mr Thorbjørn Jagland, in co-operation with and with the support of:

- The Community of Protestant Churches in Europe (CPCE)
- STOA (Science and Technology Options Assessment)
- Members of the European Parliament
- The European Commission 7FP Ethentech Project
- The Austrian Bioethics Committee
- The CSRES (Centre de Sociologie des Religions et d'Éthique Sociale - Strasbourg)
- The European Network of Healthcare Chaplaincies (ENHCC)

A range of high-level experts in theology, philosophy and ethics, and natural and human sciences presented their views and discussed with representatives from CEC member churches and other faiths and convictions and representatives from the Council of Europe and EU Institutions. A common workshop with STOA was held in the premises of the European Parliament in Brussels. About 100 participants took part in the workshop, which could be followed simultaneously on TV and Internet. Representatives of Judaism, Islam and Humanists were also among the speakers, as well as experts working with STOA.

The concluding press release of the Conference reads: *"For Christians, human enhancement is situated between two poles: on the one hand, freedom in the Christian sense, on the other*

hand, dependence on God and the gift of life. In a Christian understanding, freedom is related to love for God and for one's neighbour. This gives us the responsibility to see that our use of freedom expresses our respect and compassion for ourselves and the neighbour as created in the image of God. Freedom can be perverted into forms of despair, i.e. people do not accept themselves as they are. However, some forms of enhancement might be seen as expressions of Christian freedom. The main guiding criterion is whether human enhancement genuinely, on the long term, would promote life as creatures of God, or would entail unacceptable risks for and threats to individuals, humanity as a whole, both in present and future generations, and the environment. We urge the churches of Europe to undertake and extend their work in this field, including neuro-enhancement, the psycho-social context of enhancement, the tendency to reduce the human condition to a medical or technological problem. Enhancement is too vague a concept and we should focus more on particular cases."

This publication contains most of the presentations made at the 2012 consultation, and some additional ones. The articles range from an open and positive approach to some aspects of human enhancement through to rejection or strong warnings against risks of what the ancient Greeks called hubris, i.e. human arrogance based on the assumption that everything which could be done should be done, or at least attempted. Some authors closely work with the Council of Europe, others with the EU Institutions. The book reflects the broad constituency of CEC, including, in some cases, very specific and original approaches. The contributors' expertise ranges from natural science to theology and philosophy, through human sciences and medicine. All the articles include a moral and ethical dimension. There is also the address by Metropolitan Emmanuel of France, President of CEC, conveying the greetings of the Ecumenical Patriarch Bartholomew 1st, and inviting participants to "take lessons from scripture, tradition and history" in order to find positions of "balance, wisdom and appropriate caution". The editors hope the book will nurture and encourage further reflection and debate among experts and interested people. Your feedback will be highly appreciated.

A special word of appreciation and thanks goes to Dr. Theo Boer for his relentless and very competent work during the whole editing process.

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Chapter 1

HUMAN ENHANCEMENT: A POLICY PERSPECTIVE FOR THE EUROPEAN UNION

by Ruud ter Meulen

HUMAN ENHANCEMENT: A POLICY PERSPECTIVE FOR THE EUROPEAN UNION

by **Ruud ter Meulen**

This chapter deals with the policy options of the European Commission on human enhancement: what policy instruments already exist, what measures might be needed going beyond the existing policy instruments, what ethical issues might arise when developing new policies on human enhancement, and what initiatives are being undertaken by the Commission to prepare such actions. The chapter focuses on human cognitive enhancement as this has become the focus of attention in academic and political circles. The chapter concludes that in the context of human enhancement a shift is needed from the existing safety regulation of medical products towards discovering what European societies want to get out of these technologies. This means assessing the impacts of human enhancement technologies on the moral values of our society. The chapter is based partly on contributions made to the EPOCH project, funded by the European Commission in 2010-2012.

1.1. Introduction

Human enhancement is on the top of the ethical, philosophical and political agenda. The idea that we might be able to augment or ameliorate human capacities by the application of biotechnologies, nanotechnologies, hardware implants and computer technology seems to fascinate many academic writers and is beginning to attract interest from a wider public. It has resulted in an avalanche of publications about the merits and risks of human enhancement,¹ but also in an increasing number of science café meetings, public debates and popular press publications. Moreover, a number of ethics advisory bodies and medical-professional bodies have published opinions and guidance about the ethical and legal issues of human enhancement by way of biotechnologies.² The focus of attention is generally on the issue of cognitive enhancement by pharmacological drugs, though other ways to 'boost brain power', for example by way of brain implants or brain computer interfaces are receiving increasing interest.

While many publications on enhancement deal with visions about how 'good' or 'bad' human enhancement is, or will be. However, little has been written about policy-making in this area. In Europe, for example, there are no policies on human enhancement, neither on a national nor on a European level. If human enhancement is going to be a realistic scenario for improving human capacities, it will have a significant impact on our societies in relation to academic and economic performance as well as social relationships and

distributive justice.

It might seem obvious then that these issues should become part of the political and regulatory agenda in the European Union. Human enhancement may affect not only the free flow of goods and persons between Member States, but could also have an impact on the structure of European societies. For example, the issue of eugenics which is often associated with human enhancement, should be an important concern at the European level.

This chapter deals with the policy options of the European Commission on human enhancement: which policy instruments do already exist, what measures might be needed going beyond the existing policy instruments, what ethical issues might arise when developing new policies on human enhancement, and what initiatives are undertaken by the Commission to prepare such actions. The chapter will focus on human cognitive enhancement, as this has become the focus of attention in academic and political circles. It is based partly on contributions made to the EPOCH project,³ funded by the European Commission in 2010-2012 and coordinated by the University of Bristol.⁴

1.2. Existing Policies and Regulations in the EU with Regard to Human Enhancement

To date there are no regulatory measures or normative frameworks in the European context which focus explicitly on human enhancement.⁵ There are opinions of Ethics Advisory Bodies referring to or reflecting on human enhancement, such as the Report of the EU High Level Expert Group on converging technologies⁶ and Opinion 20 of the European Group on Ethics (EGE) in Science and Technology on information and communication technology (ICT).⁷ The first report was rather critical of human enhancement and warned against an 'engineering of the mind' by way of nanotechnologies. The Opinion of the EGE about ICT implants was positive about therapeutic use of ICT implants in the human body, but argued that for some uses regulation was necessary, as in the case of implants that change psychic functions and implants that are used for surveillance. Implants that are used to change identity, memory and perception of the self and others should be banned.⁸ The EGE argued that the distinction between medical and nonmedical uses of ICT technology, or between 'therapy' and 'enhancement' is important, and that certain nonmedical uses of these technologies should be treated with caution as they could be a threat to human dignity and democracy.⁹

The reports by the Ethics Advisory Bodies have not elicited an official response from the European Commission, nor have they resulted in any regulation, prohibition or restriction. There was a recommendation by the European Commission in 2008 on the responsible use of nanotechnologies, including a statement that nanotechnologies and nanotech-

nologies research organisations should not undertake research aiming at non-therapeutic enhancement of human beings which may lead to addiction or solely for the 'illicit enhancement of the performance of the human body.'¹⁰

The fact that there are no explicit regulations or directives by the European Commission does not mean that the topic of human enhancement has not attracted the attention of the staff at the Directorate-General for Research at the European Commission, particularly the Science-in-Society Unit. The Unit recognizes that human enhancement poses many ethical and social challenges and that it is of paramount importance that – as with all EU funded research – any research with the aim of enhancement is carried out in compliance with fundamental ethical principles. As part of the activities of the Directorate General for Research and Innovation (DG RTD), the Science in Society programme of FP7 has funded several projects pertaining to the Ethical, Legal and Social Aspects of Human Enhancement. Moreover, the DG RTD has organised sessions on this theme at the Forum of National Ethics Councils, which Forum is also supported by DG RTD. Furthermore, to stimulate reflection on the challenges of these developments, the Science in Society Programme has funded, *inter alia*, the ENHANCE and the above-mentioned EPOCH project. To continue the reflection and shared discussion about the issues surrounding human enhancement, the Science-in-Society programme issued a call for proposals in 2012 to fund a so-called 'Mobilisation and Mutual Learning Action Plan' (MMLAP) with regard to human enhancement. This MMLAP will bring together all relevant stakeholders to discuss the conditions that can ensure responsible research and innovation in this field. It is expected that this MMLAP will start in spring 2013.

In spite of the growing interest of the European Commission in the ethical, legal, and social issues of human enhancement technologies, no regulatory action has been taken that is focused exclusively on human enhancement. That is not to say that the use of biotechnologies for human enhancement is unregulated. The use of biotechnology and advanced medical technologies is regulated by Regulation No. 1394/2007 which aims to guarantee the safety and quality of advanced medical therapies and products produced by biotechnologies. Quality and safety measures for advanced medical products are also part of an array of other regulations.¹¹ If the medical products or procedures are used for human enhancement, like for example so-called cognitive drugs, they should comply with the safety and quality standards formulated in the EC regulations.

The safety and quality standards for pharmaceuticals and medical devices are linked to a specific use of these products, meaning that they can be used safely only for a specific medical indication. However, how should the doctor respond when a patient without this indication asks for a drug to improve his or her memory or to stay awake because of pressures at work? An example might be a student who wants to get a prescription for Aderall

or Ritalin (methylphenidate) to improve his or her vigilance and memory capacity when preparing for an exam. Ritalin and Aderall are drugs that are normally used for the treatment of Attention Deficit Hyperactivity Disorder (ADHD). Another example is a young doctor who is under severe pressure to work overtime in a hospital and wants a prescription for Modafinil to stay awake. This drug is normally indicated for people with sleep disorders, and is used to keep them awake (instead of falling asleep frequently). The off-label use of drugs, i.e. in situations where the medicine was not prescribed for, is dependent on the discretion of the physician and the responsibility of the physician and his or her patient. However, if it is to be in accordance with the regulations, this off-label use must be therapeutic. Any non-therapeutic prescription of pharmaceutical drugs (as in the two cases above) is illegal and will have consequences for the civic and criminal liability of the physician.¹²

The off-label use for enhancement and the possible lack of safety in case of non-therapeutic indications is an important issue. There are increasing concerns about the potential harms of drugs like Modafinil and Ritalin because of their addictive potential. According to Heinz et al, dopamine concentrations which are triggered by 'normal stimuli' such as food, sex and human communication, increase by approximately 50% to 100%.¹³ However, drugs that directly affect dopamine transporter function (e.g., amphetamine, cocaine and the psychostimulants methylphenidate and Modafinil) induce dopamine releases ranging from 175% to 1000%. As a result, subjects learn to crave for the 'more effective' drugs of misuse and lose interest in non-drug-associated stimuli. Off-label use of Modafinil and Ritalin can lead to serious addiction and mental health problems because of the powerful boost they give to the endorphin levels in the brain (incomparably stronger than 'natural enhancers' like coffee). Besides, these drugs (particularly the drugs containing amphetamine) have other serious side-effects, like heart and blood pressure problems.¹⁴ When used outside a medical context, the safety standards should be high, certainly if there is no control or monitoring by doctors. Besides, recent studies into the effect of cognitive enhancing drugs do not show any improvement of cognitive functioning; some of them even show impairment. Research by a German group of researchers shows that methylphenidate (Ritalin) may improve memory but there is no effect of other cognitive enhancing drugs.¹⁵ The serious harms of the off-label use of these drugs are in no way balanced by potential benefits.

1.3. Enhancement and Therapy

The ethical (and legal) problem of off-label use of medical products has been complicated because of the difficulty of making a distinction between therapeutic and enhancement use of such products. In his book *Better than Well*, Carl Elliott describes how individuals who were not feeling very happy with their life, but who were not severely depressed according to psychiatric definitions and measurements (Hamilton Scale), got a prescription for antidepressants like Selective Serotonin Reuptake Inhibitors (like Prozac and Seroxat).¹⁶ Perhaps

they were only mildly depressed, but where should we place the threshold? Physicians may have different interpretations as to what a severe depression looks like. The same can be said of children or young adults who display restless behaviour and get a prescription for Ritalin. It is not clear in the first place whether their behaviour is caused by medical causes. But if it is, how restless should one be to get a prescription for Ritalin?

The debate about the distinction between human enhancement and therapy often refers to a scale with, at one end, examples of enhancement and, at the other end, the normal applications of medical technology. However, there is no consensus about what should be seen as a normal application of medical technology. This is one of the major difficulties with the off-label use of treatments for enhancements. A normal application is defined as a treatment that falls within the goals of medicine, like the treatment of a disease and the alleviation of suffering. Yet establishing robust distinctions is not so easy. Take, for example, the following case:

Johnny is a short eleven year old boy with documented growth-hormone deficiency resulting from a brain tumour. His parents are of average height. His predicted adult height without growth hormone (GH) treatment is approximately 160 cm (5 feet 3 inches). Billy is a short eleven year old boy with normal GH secretion according to current testing methods. However, his parents are extremely short, and he has a predicted adult height of 160 cm (5 feet 3 inches).¹⁷

Johnny's shortness is a function of his disease, while Billy has a normal genotype, one that produces normal levels of GH. However, both boys are similar as they are both short and suffer from this shortness, as our society values tall stature. In Johnny's case, one could say GH treatment falls within the goals of medicine and is an acceptable treatment. However, for Billy there is no disease. In his case GH treatment can be considered an enhancement, and thus a treatment that falls outside the medical domain.¹⁸

In view of conceptual difficulties in making a distinction between therapy and enhancement, there are some authors who would like to drop this distinction on the grounds that it is not very useful for the ethical debate. For example, the British ethicist John Harris argues that we should only look at the benefits and harms of treatments and forget about the difference between enhancement and therapy: "The overwhelming moral imperative for both therapy and enhancement is to prevent harm and confer benefit. Bathed in that moral light, it is unimportant whether the protection or benefit conferred is classified enhancement or improvement, protection or therapy".¹⁹ However, if we would drop the distinction between therapy and enhancement, it would be very difficult to develop any policies regarding human enhancement. For example how should we deal with the off-label use of medical drugs or who should pay for the (enhancement) use of these drugs?

Should the individuals pay out of their own pockets or should they be provided by the public health service (free or with a co-payment)? Besides, there are other ethical issues which will be difficult to resolve if we put aside the distinction, like for example issues of justice and dignity. As mentioned above, the European Group of Experts argued that for this reason the distinction between medical and non-medical uses of ICT technology, or between 'therapy' and 'enhancement' is important, and that certain non-medical uses of these technologies should be treated with caution.²⁰

1.4. Policy Issues for the European Union

According to Roger Brownsword, human enhancement requires a broader approach than safety and risk regulation techniques: "Developments in several fields of human enhancement pose questions that demand a wider and collective approach. They force us to reflect on who we are, how we think about new scientific, medical and cultural norms, identities and practices. Human enhancement requires a more moral debate than regulation and risk control by the state can offer. And it demands more public consideration than is possibly available by reflection from individual consumers."²¹

If the European Union should look at wider issues than safety regulation, as Brownsword is suggesting, what issues should be subject to further policy-making? The following gives a (non-exhaustive) list of questions and issues for future policy-making with regard to human enhancement.

1.4.1 Should the EU Invest Funds in Research into Human Enhancement?

If the European community believes that (cognitive) enhancement may have a positive value for various activities and areas (like the economy, education or academic research), it might be wise to further invest in research in safe and effective cognitive enhancers. At the moment cognitive enhancers, particularly pharmaceutical drugs, are not very effective and are dangerous, mainly because of their addictive potential. Brain-computer interfaces and mechanical cognitive enhancers like Transcranial Direct Stimulation and Transcranial Magnetic Stimulation might have less risk of addiction, but may have other side-effects. Such issues should be researched before such technologies should be applied for the purpose of cognitive enhancement.

However, research into human enhancement is problematic in view of the current regulation of medical research. This regulation considers efficacy of the product (one of the criteria for the assessment) as 'therapeutic efficacy'.²² Human enhancement is not therapy (though, as said above, the distinction is not clear). There are of course many non-therapeutic trials going on in Europe, but generally these trials are part of a medical research trajectory to develop a new drug or device (like for example Phase 1 Safety research).

Where does this leave enhancement research? If it were possible to regulate such research through the current directives for medical research, there would still remain the question whether research sponsors, research ethics committees and research participants would be able to assess the benefits of human enhancement technologies, particularly because this might depend on subjective views as to how 'enhancement' should be defined.

1.4.2 How should Access to Human Enhancement Technologies be regulated?

If human enhancement technologies are proven to be safe and effective, how should they be made available to the public? Should they be made accessible via the public health system or should they be sold over the counter? The advantage of access via the public health system is that in that case physicians can control the use of enhancement drugs (and the possible side-effects) within the physician-patient relationship. However, the EU has no jurisdiction with regard to health and social care that is provided by the Member States and cannot prescribe the inclusion of enhancement drugs or technologies in the basic package of the national health services of the Member States. Free sale of enhancement drugs 'over the counter' is also problematic as there would be no medical control. If the latter alternative were chosen, the EU would have an important task to control the safety of the enhancement products (which does fall within its legal powers).

1.4.3 How can we reach just Access to Human Enhancement Technologies?

It is a deep understanding in European societies that as a society we have an obligation to help persons who are in need of medical treatment. This obligation is based on solidarity with weaker groups in society and particularly with persons who cannot help themselves. In medical ethics, this obligation is theoretically analyzed by the concept of distributive justice. This concept says that there should be a reasonable distribution of the benefits and the (financial) burdens of medical treatments between the individuals in our society. However, it is not clear whether access to enhancement technologies should be guided by the same principles of justice as access to medical therapies and care which are provided via the public health care system.²³ Should a society fund enhancement technologies which go beyond medical need? If we think that societies have an obligation to fund enhancement technologies, for example to create a level playing field in social and academic competition, which of these technologies should be made available publicly and at which cost? Are such decisions the prerogative of the Member States or does the European Commission have a say in them? The answer depends partly on the view as to how cognitive enhancers should be supplied: through the public health care systems or through other distribution systems.

1.4.4 Should the use of Enhancement Technologies be based on Individual Choice?

Respect for individual autonomy is an important principle in medical ethics. It should also guide the implementation of human enhancement technologies. This is important to counteract social pressures to use enhancement technologies, for example in academic, economic and military contexts (like pressure on pilots of military airplanes to use Modafinil to stay awake during long-haul flights). However, there is also an issue for public health: when enhancement technologies are not safe or their prescription is illegal (see above), free choice should be limited. Particularly when cognitive enhancing drugs like Modafinil and Adderall have a high risk of addiction, these drugs should be banned on public health grounds. This may sound paternalistic, but public health measures (like smoking bans and safety belts) are essentially, and inevitably, of a paternalistic nature. This is certainly an area for European policy-making.

1.4.5 How can we Protect Vulnerable Groups?

Enhancement technologies are sometimes seen as a new kind of eugenics, which tries to ameliorate the physical and psychological make-up of humankind. In the first half of last century, the eugenic movement resulted in the sterilization and killing of many handicapped persons and people with psychiatric and psycho-geriatric disorders because they did not meet the ideals of race and humanity. People with physical and learning disabilities have the feeling that the application of enhancement technologies will lead to a new kind of eugenics that might result in a less favourable view on disabilities and on their existence as members of society. Proponents of enhancement technologies argue that the 'new' eugenics differs from the 'old' eugenics because of the emphasis in the 'new' eugenics on free choice and autonomy (so-called liberal eugenics).²⁴ Nonetheless, the basic idea remains the weeding out of undesirable physical and psychological traits, which may lead to discrimination of handicapped persons. Free choice includes the right not to enhance oneself, like for example individuals with disabilities who do not want to change their (limited) capacities as they feel that these define their identities.²⁵ For example, some deaf people have a negative view on the implantation of cochlear hearing implants to improve their hearing capacities on the grounds that such implants have a significant impact on their culture and their identity. The fight against discrimination and for the inclusion of people to disabilities is an important goal of the European Union and should be part of the policy-making with regard to human enhancement.

1.4.6 How can we Protect Solidarity and Dignity in the Context of Human Enhancement?

There is a concern among some authors that if enhancement technologies are not embedded in a broader view on human personhood and dignity, they might result in an

individualisation of our society and a decrease in solidarity with weaker and vulnerable groups. For example, Sandel argues that the use of enhancement technologies comes at the expense both of an attitude of acceptance of our limitations and of the notion of 'giftedness.' Sandel argues that there is a connection between the notions of 'giftedness' and 'solidarity': as soon as we are aware of the contingency of our gifts, we will develop our capacity of seeing ourselves as sharing a common fate.²⁶ Those who think enhancement is ethically contentious argue that by the addition of non-native skills or the improving of existing qualities, enhancement technologies have an impact on human dignity. They claim that 'nature' and 'natural processes' are fragile, and that the unknown long-term effects of enhancement technologies make the use of these technologies a danger for present and future generations. However, other authors claim that the desire for enhancement of human capacities is a natural part of being human. The urge to transform ourselves has been a force in history as far back as we can see. It is a natural outgrowth of our human intelligence, curiosity and drive. To turn our backs on this power would be to turn our backs on our true nature.²⁷

The concerns about the impact of human enhancement technologies on human dignity and solidarity are certainly worth investigating through European research. This would help to clarify the use and meaning of these concepts and values and would help stimulate the discussion. Part of the process of policy-making by the European Commission on human enhancement should be the continuation of philosophical and social research in this area. Such research should include clarification of the distinction between enhancement and therapy, which to some extent is in the background of the discussion on human nature, dignity and solidarity.²⁸

1.5. Governance of Biotechnologies and Human Enhancement

Recent debates in both science and technology studies as well as ethics point in the direction of a complementary and integrated approach to the governance of science and technology.²⁹ This means that the issues mentioned above should be part of an approach that goes beyond the cautionary policy regarding risks and benefits and includes the concerns about justice, dignity, and solidarity with vulnerable groups. Such an integrated approach to governance should involve public participation by citizens, users, public and stakeholders. This would make it possible to take societal concerns and expectations into account when considering the development and use of new technologies. A good example is the concept of 'Responsible Research and Innovation (RRI),' as put forward by the European Commission.³⁰ RRI sets out a new approach to the ethics of technology, including human enhancement technologies, by focusing not only on the possible negative impact of technology, but also on an assessment of the merits of the new technologies for the development of modern society.

Governance of science and technology needs to get away from the limited perspective of safety, risks and precaution, as for example Brownsword argues above: it should include issues such as justice, solidarity with marginalised groups, prevention of exclusion, and protection of privacy. We should not merely ask whether a technology is safe, thereby making this the only possible barrier to innovation, but we should also ask what the technology might mean in a societal setting. This means that we need to ask what kind of society we deem desirable, rather than merely looking at how we can facilitate innovation successfully. We should not leave the ethical assessment and the policy-making to a few experts or expert advisory bodies. Policy-making in the field of biotechnology should engage as many stakeholders as possible, including members of the public. Public participation is essential if we are to discover our views of the right society and to integrate these views in the policy-making process.

In the context of human enhancement a shift is needed from the existing safety regulation of medical products towards discovering what European societies want to get out of these technologies. This means assessing the impacts of human enhancement technologies in advance, particularly the impact on the moral values of our society. Relevant questions are: what is the impact of these technologies on vulnerable groups, what kinds of enhancement do we think are desirable, how should we regulate access to enhancement technologies, and how much freedom should be left to individuals to use these technologies? When answering these questions, the focus should be on anticipating problems and on visions of the future use of enhancement technologies,³¹ instead of merely on the regulation of risks and safety. An example of 'anticipatory governance' is the Mobilisation and Mutual Learning Action Plans of the Commission, the first of which will start in 2013, including one on human enhancement. These plans are an important step in the direction of Responsible Research and Innovation, by bringing together and engaging relevant stakeholders in order to discuss the conditions for responsible research and innovation in the field of human enhancement technologies as well as their use in society.

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Chapter 2

TOWARDS INTERNATIONAL REGULATION OF NEUROENHANCEMENT

IS THERE A ROLE FOR HUMAN RIGHTS?

by Doris Wolfslehner

TOWARDS INTERNATIONAL REGULATION OF NEUROENHANCEMENT

IS THERE A ROLE FOR HUMAN RIGHTS?

by **Doris Wolfslehner**

The chapter discusses the emerging desire to enhance the functioning of our brains and the related ethical debate. It argues that both strands of neuroenhancement, pharmaceutical enhancement and non-invasive brain stimulation techniques, need to be considered in this debate. As the challenges of neuroenhancement to society are far from being settled, it calls for a broad discussion of the issues at stake in the Human Rights context. The Council of Europe seems best fit to make a substantial contribution to this discussion.

2.1. Introduction

The age-old question about the functioning of our brains and our minds has led to rapid developments in the field of neuroscience.¹ On the one hand, we are confronted with ever new techniques in the field of neuroimaging since the 1980s, which have made it possible to better understand the functioning of the brain and have thus led to new treatments and research findings in the field. On the other hand, we are confronted with a yearning for the enhancement of the cognitive functioning of the brain in healthy human beings.

In this contribution we will first look at the phenomenon of enhancement and neuroenhancement and the related ethical debate (section 2). We will then analyse the challenges of neuroenhancement in relation to human rights (section 3) and in conclusion call for a broad discussion of all forms of neuroenhancement in the human rights context (section 4).

2.2. Enhancement and the Related Ethical Debate

The international ethical debate on enhancement was opened by the President's Council on Bioethics of the US in 2002. The Council explored a variety of technologies related to enhancement, such as drugs and gene transfers enhancing athletic performance, genetic means of augmenting muscle strength and vigour, techniques for controlling the sex of our offspring, genetic and other means to retard senescence and increase the human lifespan, prospects for genetic enhancement through genetic diagnosis, and psychoactive drugs that can alter mood, memory, and behaviour.²

The debate on human enhancement has many different strands, starting from the deliberations on transhumanism and covering medical and technical enhancement in many different fields. Finding the proper terminology is not easy here. Leon Kass, former chairman of the Council, points to the problem of distinguishing between 'therapy' and 'enhancement':

"People who have addressed our topic have usually approached it through a distinction between 'therapy' and 'enhancement': 'therapy,' the treatment of individuals with known diseases or disabilities; 'enhancement,' the directed uses of biotechnical power to alter, by direct interventions, not diseased processes but the 'normal' workings of the human body and psyche. Those who introduced this distinction hoped by this means to distinguish between the acceptable and the dubious or unacceptable uses of biomedical technology: therapy is always ethically fine, enhancement is, at least *prima facie*, ethically suspect"³

The President's Council on Bioethics finally defined human enhancement as going 'beyond therapy.' Instead of restoring an individual to a healthy normal state, enhancement enables a person to exceed this healthy or normal state.

The Danish Council of Ethics focuses on medical enhancement 'as a way of improving cognitive abilities'.⁴ In doing so, it brings us closer to the issue of cognitive enhancement. The term 'medical enhancement' refers to so-called 'off-label' uses of medication, i.e. in situations where the medicine has not been prescribed by a doctor for the person taking the medicine. Examples are medicines like SSRI drugs (antidepressants), modafinil (used to treat narcolepsy) and methylphenidate (used to treat attention deficit-hyperactivity disorder, ADHD). In order to support the intuitive aversion against "the use of medicine to consolidate and ameliorate perfectly ordinary attributes such as memory and concentration in people who are not ill in our everyday understanding of the word," the Danish Council argues that medical enhancement is detrimental to fairness and justice, leads to a loss of authenticity, erodes valuable conditions for coexistence between people, and warns of side-effects, such as sleeplessness.⁵ The arguments put forward by the Council are rooted in the classical set of bioethical principles of autonomy, beneficence, non-maleficence, and justice as described by Tom L. Beauchamp and James F. Childress.⁶ We will come back to these principles below.

In the ethics debate of professional ethicists, as represented in national bioethics committees, the debate on neuroenhancement revolves around issues related to medical enhancement, as described by the Danish Council of Ethics. Although this might be the more imminent problem, as pharmaceutical enhancers are widely available to the general public, the literature suggests that neuroenhancement can also relate to non-invasive brain stimulation techniques or to neurofeedback techniques based on electroencephalography (EEG). *Non-invasive brain stimulation techniques* which can be used for enhancement

are techniques such as transcranial magnetic stimulation (TMS) and transcranial direct current stimulation (TDACS), both of which may enhance cognitive skills, mood, and social cognition.⁷ EEG neurofeedback is today being studied in relation to ADHD treatment, but could also be used for enhancing cognitive skills by training certain regions of the brain.⁸

In summary: 'neuroenhancers' refer to biotechnological applications intended to make people think or feel better, either through pharmaceutical intervention or through non-invasive stimulation techniques or neurofeedback. Neuroenhancement is rooted in clinical applications which are used on healthy individuals to improve their productivity, wakefulness, feeling and minds.⁹

2.3. Challenges of Neuroenhancement to Human Rights

Several regulatory frameworks are applicable to biomedical research and innovation at international level. These include the *Nuremberg Code of 1947*, the World Medical Association's *Declaration of Helsinki 1964* in its latest revision, several UNESCO Declarations, and the document *Convention on Human Rights and Biomedicine*, issued by the Council of Europe in 1997.¹⁰ The only instrument which is legally binding in this context is the *Convention on Human Rights and Biomedicine*. All the other texts are non-binding commitments of the Member States, which result in a common understanding of the issues concerned, but do not have any legally binding force and are not considered here.

The relevant articles of the *Convention on Human Rights and Biomedicine* can be grouped according to the well-known bioethical principles of autonomy, beneficence/non-maleficence, and justice. Aspects of neuroenhancement which are challenging the principles laid down in the *Convention on Human Rights and Biomedicine* are mainly linked to the debate as to which treatments fall within the goals of medicine and 'normal' application of medical technology, and touch on issues of autonomy and beneficence/non-maleficence and the principle of justice regarding fair distribution of goods within society. They are analysed in order to demonstrate the possible role of the Council of Europe in debate on the ethics of neuroenhancement.

2.3.1. Autonomy

The principle of autonomy in relation to neuroenhancement is reflected in articles 5 and 10 of the *Convention on Human Rights and Biomedicine*. Article 5 primarily relates to the rule of free and informed consent, which includes a duty to provide appropriate information beforehand with regard to the nature of the intervention and its consequences and risks. Article 10 addresses the protection of information on one's health, the right to know and the right not to know.

The rule of free and informed consent is challenged by the fact that in neuroenhancement the line between therapy and enhancement is difficult to draw. This may lead to an increasing medicalization of societies beyond what is necessary for therapeutic purposes.¹¹ Due to widespread off-label use of pharmacological enhancers, appropriate information as to the nature of the medicine used and its consequences remains with the individual, who will have difficulties to assess the implications of its use by him or herself.

The protection of information on one's health, the right to know, and the right not to know are challenged by non-invasive brain stimulation techniques. These techniques will always need a medical practitioner as intermediary. Security of data collected in this context (i.e. the possibility that stored health data are used for third purposes and are transmitted to, e.g. insurance companies or employers) and the possibility of incidental findings may conflict with the protection of sensitive data, such as health data, as well as the right to know and the right not to know.

There may arise further questions regarding personal identity which are also connected to the principle of autonomy, but which are not directly addressed in the Convention on Human Rights and Biomedicine.

2.3.2. Beneficence and Non-Maleficence

The principles of beneficence and non-maleficence are reflected in articles 2 and 4 of the Convention of Human Rights and Biomedicine. Article 2 reads: "The interests and welfare of the human being shall prevail over the sole interest of society or science." And article 4: "Any intervention in the health field, including research, must be carried out in accordance with relevant professional obligations and standards."

Compliance with professional standards is challenged by off-label use of pharmacological enhancers. Many substances, although prescribed in a medical context, are often used without therapeutic or other medical necessity. Third parties – outside patients and their physicians – may have major interests involved in marketing these substances. The commercial trading of pharmaceutical substances outside a medical context may be a criminal offence in most countries, but the widespread tradition of excessive prescription of medicines in a highly 'medicated' world stimulates an excessive supply. A new framing of compliance with professional standards could therefore reduce off-label use of pharmaceutical enhancers. Larriviere suggests that the problems regarding off-label use and the lack of data about it should be part of the informed consent procedure and make patients aware of related problems.¹²

The literature also discusses risk-benefit analyses and safety concerns. Short-term effects of neuroenhancement medications are well known for patients suffering from the disorders the medications are intended to treat. However, long-term effects of these medications in a normal population have hardly been studied and are largely unknown. Some authors suggest, for example, that Ritalin can lead to addiction, Prozac may influence the libido and can lead in some patients to aggression and suicidal potential, and that Seroxat can lead to cardiac incidences.¹³

The principle that societal and scientific interests shall not overrule the interest and welfare of the individual is challenged by arguments relating to the societal impact of pharmaceutical and non-invasive techniques of neuroenhancement. It is argued by Julian Savulescu, for example, that increased intelligence, memory, self-discipline, foresight and optimism on the part of the individual will impact on society by producing increased well-being and better economic performance.¹⁴ This argument challenges the primacy of the individual human beings and their dignity, a principle which implies also that an individual deserves respect in him- or herself for the way he or she has been born and conducts his or her life notwithstanding all possible defects. Ilina Singh formulates this correlation rightly as follows: "Widespread neuroenhancement may also come to constrain concepts of 'the normal' and lead to lower tolerance of cognitive and other notable differences and disabilities."¹⁵

2.3.3. Justice

The principle of justice has been operationalized in article 3 of the Convention on Human Rights and Biomedicine: "Parties, taking into account health needs and available resources, shall take appropriate measures with a view to providing, within their jurisdiction, equitable access to health care of appropriate quality." With respect to the argument for creating a better society through neuroenhancement, the competitive aspect needs to be considered. Ilina Singh describes that "since the introduction of psychotropic drug treatment for ADHD more than 50 years ago, paediatric stimulant medication have been used as [...] study aids throughout the United States. [...] Estimates of non-prescription use of stimulants were below 0.5% until 1995. [...] However, since the mid-1990s, these numbers have increased, with 2.5% of U.S. high school students, college students and young adults consistently reporting non-prescription use of stimulants."¹⁶ The widespread use of cognitive enhancers will put enormous peer pressure on those who are not willing to, or cannot afford to, take enhancing drugs. Even if we presume that neuroenhancement does not pose any risk to the individual in terms of addiction or other negative influences on the individual's health, it can be assumed that pharmacological enhancers will remain a 'privilege' of the rich. They will thus widen the social and educational gap and will be detrimental to social justice.¹⁷

2.4. Conclusions

There has already been a lively debate on neuroenhancement among professional ethicists, as represented in National Bioethics Commissions, and among scientists, which have led to increased awareness of the issues at stake in relation to general bioethical principles. In this short overview, I have explored how neuroenhancement may challenge Human Rights principles as laid down in the Council of Europe Convention on Human Rights and Biomedicine. These principles include informed consent, the duty to provide appropriate information beforehand as to the nature of the intervention and on its consequences and risks, the principle of the primacy of the human being and compliance with professional standards, and the principle of equitable access to health care of appropriate quality. Therefore, general guidance for the phenomenon of neuroenhancement is urgently needed. The Council of Europe is best fit to make a substantial contribution to an appropriate international approach towards the regulation of neuroenhancement.

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- ¹³ A. Springer, "Die Moderne und die Droge," in: D. Sollberger, F. Müller-Spahn *et al.* (eds.), *Geist der Moderne*, Berlin 2009, pp. 128-139.

- ¹⁴ J. Savulescu, 13th Forum of national Ethics Councils: Emerging Technologies in an Age of Globalisation, 2009. Available at: https://europa.eu/sinapse/sinapse/index.cfm?fuseaction=cmtypubdoc.home&CMTY_ID=6D4032FB-FB5C-F679-CC891CED74EA6899&request=1&FOLDER_ID=21C47AF7-C09D-7EAB-93C3CD2BF17AAB0E
- ¹⁵ I. Singh and K. Kelleher, "Neuroenhancement in Young People: Proposal for Research, Policy, and Clinical Management," in: *AJOB Neuroscience*, 1(1), 2010, pp. 3-16.
- ¹⁶ *Ibid.*
- ¹⁷ G. Schäfer and D. Groß, "Enhancement: Eingriff in die personale Identität," in: *Dtsch Ärztebl.* 105(5) (2008), pp. 210-2.

Chapter 3

**I DON'T WANT COMFORT,
I WANT GOD, I WANT POETRY,
I WANT REAL DANGER**

by Theo Boer and Cees Dekker

I DON'T WANT COMFORT, I WANT GOD, I WANT POETRY, I WANT REAL DANGER

by **Theo Boer and Cees Dekker**

In this chapter, we present a Christian reflection on 'human enhancement'. After a brief overview of converging technologies, especially those at the interface of living and lifeless matter, we comment on some popular future scenarios related to human enhancement – from overly optimistic 'transhumanists' to 'doomsday prophets' – and we provide arguments for a more nuanced debate. We emphasize the difference between medical research aimed at restoring 'normal' human functioning, and human enhancement that explicitly targets to expand the normal human capacities. While biblical faith offers a strong theological license to develop and use new technologies, we criticize technologies aiming to 'enhance' humans beyond their natural capacities. If this is even feasible at all, the intention to do so implies a mistaken pretence to be able to set the destiny of the human species. Properly seen, 'human enhancement' is a theological concept which in our opinion can only be realized at the level of moral virtue and a pious relationship with the living God.

3.1. Introduction¹

A few years ago, the *New Scientist* asked a number of top scientists about their expectations for the coming 50 years.² These were some of their answers: by using artificial eggs and sperm cells, engineered from the body cells of both parents, virtually all babies will be born without genetic defects; new medications will enable the human body to regenerate limbs that got lost due to illnesses or trauma; with the use of brain stimulating medications, humans will be able to have new mystical experiences and to face their mortality without fear; the human mind will be extended with implantable, organo-electrical brain-machine interfaces; portable devices will lead to new approaches to developing therapies for cognitive diseases such as schizophrenia, autism, depression and Alzheimer's; psychologists will be able to use imaging devices that will tell us what is going on in the brain as we make judgments, take decisions, negotiate with one another and form expectations and intentions; nonbiological computer intelligence will be a trillion times greater than the combined intelligence of all human brains and in the end humans will merge with the tools they have created; all this also implies the risk of abuse, such as implanting erroneous thoughts in the minds of others and influencing their preferences and decisions.³

More than eighty years back, Aldous Huxley published his famous book *Brave New World*.⁴ This novel sketches a terrifying world in which genetic engineering has yielded a merciless and manipulative class society. Human life is regulated from its artificial beginning to its swift, assisted end. What was previously considered adventurous and valuable is replaced by a shallow and riskless existence of happy drugs and superficial sex. At first glance, it is an agreeable world without conflicts, infirmities, guilt, or shame. It is a world in which every need finds instantaneous satisfaction, a world of multimedia top amusement and quasi-religious rituals induced by a 'soma' pill.

Characteristic of this and other views of the future is a lack of the very things that make human life worth living to most of us: loving relationships that survive 'in good and bad times'; satisfaction that is attained through enduring exercise; fulfillment that is preceded by years of patience; a capacity to deal with complex moral choices; solidarity and belonging to families and communities; the beauty of art, music, and literature; the virtues of courage, modesty, honor, obedience, commitment, qualities that are attained only through lifelong learning. It is the absence of these human characteristics which makes Huxley's optimized new world such a frightening one.

Perhaps the most horrifying aspect is that Huxley's *Brave New World* is the result of conscious and voluntary human choices. In George Orwell's novel *1984*, the state controls its citizens by exerting violence and inflicting pain. In *Brave New World*, however, there is no need for coercion: the quest for a healthier, more comfortable and happier life suffices to do the job. One of the world leaders in the book keenly observes that seduction proves to be far more effective than violence and coercion. Although the new world is established through science and (bio)technology, its theme is not so much science and technology itself, but the ways in which human choices and technical developments are interconnected and the role played by psychology and morality. Human choices and aspirations yield new technologies, which, in turn, influence future choices and aspirations.

Aldous Huxley situated his *Brave New World* in about AD 2500. In 1947, fifteen years after it was published, Huxley observed that the progress of science had been even more rapid than he had anticipated. On observing this fast pace, he said he expected the horror world of his *dystopia* to be within reach in only one century rather than five.⁵ Indeed, remarkable progress has been made with regard to some of *Brave New World's* central technical prerequisites. Information technology, genetics and neurosciences yield a steadily increasing range of possibilities to influence the fate of humanity.

What is the public response to these technological developments? Many applications, such as medical diagnostic or data storage devices offer promising possibilities without causing any controversy. On the other hand, we see public debates about the possibility

that nanotechnology or synthetic biology might sooner or later have detrimental side effects.⁶ Could nanoparticles, for all the advantages they have, perhaps become the asbestos of the future? Will the ever extending internet applications become a threat rather than a safeguard to the privacy of their users? With the help of new technology we will be able to prevent genetic diseases – but what about the potential dangers of eugenics (racial selection) and Huxley's fears of a post-human class-society? Will we end up in a society in which only human beings without handicaps will be accepted?

The dreams and fears attain an extra intensity and poignancy when it comes to the borders and limits between life and lifeless, between humans and machines. What will the effects be of interconnections between computers and the human brain for our self-understanding as humans? What if we become able to artificially create life from lifeless material? Will we be able to control potential negative effects? Some people suggest that *Homo sapiens* is on its way to evolve into an enhanced *Homo technicus*, a superhuman whose technical, mental, and physical capacities reach way beyond the capacities of present day humans, and who might one day even conquer *Homo sapiens*. One cannot help wonder: is that true and if so, will there be a way back once we discover disadvantages?

These are some of the many questions that arise from the advance of science and technology. In this chapter we provide a brief reflection on these, focusing on human enhancement. This chapter is written from the bi-disciplinary background of science and ethics. We will first briefly describe some of the accomplishments and prospects of recent technologies (section 2). Next, we highlight different reactions to these developments in human enhancement: from fear to cheer, and everything in between (section 3). After some remarks on the vocabulary of enhancement (section 4), we then make a number of specifically Christian ethical remarks (section 5). Subsequently, we illustrate our reflection by looking at a concrete example: assisted procreation (section 6). Finally, we will come back to where we began, to Huxley's *Brave New World* (section 7).

3.2. Converging Technologies

The stakes are high in the so-called 'converging technologies': nanotechnology, robotics, information technology, neuroscience, genetics, biotechnology – different research areas with increasingly frequent encounters, overlaps, and shared purposes. These fields are rapidly evolving, providing ever more new applications that open up novel future perspectives. Nanotechnology constitutes techniques that enable us to manipulate matter at the level of single atoms and molecules – an approach that can be used for basic research involving the building blocks of matter, not only of all lifeless but also of all living materials. The impact of information technology is obvious to anyone, with ever cheaper

computers and ever increasing communications. Genetic modification, which has been practiced for decades, is now experiencing a drastic increase in its technical capabilities, leading into a new field called synthetic biology.

Many of the accomplishments are impressive. We have, for example, seen remarkable progress in the area of technical devices which help restore deficient body functions. The pacemaker has been used for more than half a century (in 1958 the first fully implantable pacemaker was developed). Contact lenses and hearing aids, used by a considerable part of the population, may in the future be localized inside the body. Through surgery a cochlear prosthesis can be implanted in the middle ear. With this electronic device, which is activated by a microphone worn outside the ear, partial hearing can be regained by individuals with severe to profound hearing loss. The device bypasses damaged parts of the auditory system and directly stimulates the central nerve of hearing.⁷ In a similar way it is becoming possible to implant optical chips (the light sensitive CCD element of a camcorder) into the eye and to connect it to the nervus opticus. The first results are encouraging: persons with a complete loss of view are now able to discern some form of light.⁸ Retinal implants are currently being developed, which partially restore vision to people who have lost their vision due to degenerative eye conditions such as retinitis pigmentosa or macular degeneration.⁹ Interestingly, a more 'natural' alternative may be developed in the form of retinal regeneration but this form of bioengineering is currently still in a much earlier stage.

Even more spectacular is the option to connect computers to nerves in the human brain, enabling humans to operate machines solely by their thoughts. Certain forms of brain activity can be monitored by using an MRI-scan. Implanted electrodes are able to sense brain activity with such an increased accuracy that the recorded signals can function to operate a cursor on a screen or to make a mouse click. Matthew Nagle (1979-2007) was the first person to use a brain-computer interface to restore functionality lost due to paralysis. He was a C3 tetraplegic, paralyzed from the neck down after being stabbed. Aided by the brain-machine interface, Nagle was able to open his emails, play simple computer games and operate the remote control of his television set – all of that controlled solely by his thoughts!¹⁰ The connection can also operate in the reverse direction – from machine to the brain. Experiments with rats have shown that their movements can be influenced by humans typing a command on a keyboard which, through electric signals to electrodes in the brains of the rat, can predispose the rat to perform certain actions, such as jumping.¹¹ With the use of new technology brain signals can, therefore, both be sensed and be operated.

Zooming in to the smaller scale, the nonvisible level of molecular biology, we observe that genetics has made enormous advances in the last decades. In genetic recombination

techniques, part of the DNA of one organism can be transplanted into the DNA of another. By adding genes to the hereditary material of a micro-organism, plant, or animal, new genetic characteristics are added. In genetically modified corn, for example, the DNA is changed through the addition of a gene from a bacterium that produces a substance poisonous to insects, making the corn resistant to insect plagues. On a large scale, genetically modified micro-organisms are used for the production of chemicals and medications. Similar techniques could, in principle, be used for repairing genetic defects in the DNA of humans. Until now, attempts at gene therapy were only partly successful but the prospects are getting better. Technically, there is little difference between repairing a defect gene and adding a 'foreign' gene. The same technology that is used in gene therapy can be applied in order to add genes from plants and animals to the human DNA, if that is deemed useful for some purpose.

At the molecular scale, the differences between 'living' and 'lifeless' are blurred and ill-defined. Although even the simplest living bacterial cell is hugely complex with many hundreds of components, the understanding of the molecular cell components and their interactions is growing at a fast pace. This raises expectations that scientists in the near future, say in 10 years from now, will succeed in constructing biological complexities that will result in the construction of life-like cells. It is not unrealistic to assume that humans thus may be able to artificially construct life.¹² A new discipline, called synthetic biology, engages both in redesigning natural biological systems for more efficient use and in designing and synthesizing new biomimic components.¹³ An underlying idea is that it is possible to engineer biological systems from genes and proteins, analogous to the construction of a computer chip from components such as transistors. And indeed, many new genetic circuits have already been built and found functional in cells.

This fascinating research field provides a new perspective on living structures, a bottom-up engineering approach that is different from the traditional perspective of biology. At this moment, researchers are busy composing catalogues of biological building components and trying to build complex biological structures by using these components.¹⁴ To name just one example, a genetic network was designed and constructed which builds in a day-and-night rhythm in bacteria that do not originally have such a circadian rhythm. And by combining genes of a fungus, plant, and other bacteria, researchers have cultivated bacteria which can produce an affordable medication for malaria.

Because of its enormous scientific and application perspective, funding for research in the areas of the converging technologies is sizeable. For example, the European Community announced in early 2013 that 1 billion euro (!) will be awarded to two projects – the Human Brain Project which plans to use a supercomputer to recreate everything known about the human brain, and Graphene which plans to research the potential of an ultrathin,

conducting form of carbon for applications in computing, batteries and sensors.¹⁵ In the Netherlands, a 51 million euro subsidy was granted by the Netherlands Organisation for Scientific Research to a project, initiated by one of the authors of this contribution, that sets out to explore the frontiers of nanoscience, both the quantum world in materials as well as the building blocks of living cells.¹⁶

3.3. Between Utopia and Dystopia

How should we evaluate these developments?¹⁷ Some voices are unequivocally positive. In 2002 the renowned American science organization NSF organized a workshop entitled, 'Converging Technologies for Improving Human Performances'.¹⁸ Its organizers Mihail Roco and William Bainbridge predicted that by the year 2022 a revolution would have occurred in the way we work and produce. Broadband connections between the human brain and machines will change the ways we work, drive and relax. Sensors and computers will increase the level of human consciousness. Robots will have all the positive characteristics of hard work of humans (purposiveness, creativity, etc.), however without the disadvantages and limitations of human labor. Before the end of the 21st century, Roco and Bainbridge predict 'world peace, universal prosperity and evolution to a higher level of accomplishment and compassion'.

Roco and Bainbridge are not alone: the Oxford philosopher Nick Bostrom and the futurist Ray Kurzweil propagate a philosophy named transhumanism.¹⁹ They proclaim that we have both the means and the obligation to structurally improve the human condition by using genetic modification and other techniques. With unreserved optimism they predict that in the future humans will feature increased intellectual, physical and psychological capacities and will no longer be bound by some of our present-day biological limitations. Humans in their present form merely represent a transitional stage of the evolution (hence the term, transhumanism), the next steps being the enhancement of humans by gene- and nanotechnology and an integration of humans and computers.

Other voices, by contrast, present a doom scenario. According to Bill Joy (co-founder of Sun Microsystems), intelligent robots may in the end prove to be a stronger species than humans – causing the latter to gain at some stage the doubtful status of endangered species.²⁰ According to Martin Rees, the renowned British cosmologist and astrophysicist and former president of the *Royal Society* in London, there is a reasonable (50/50%) chance that, as a consequence of possible malign or accidental release of destructive technology, the 21st century may be *Homo sapiens*' last century.²¹ Francis Fukuyama expresses a similar pessimistic tone. In his book, *Our Posthuman Future*, Fukuyama sketches a brief history of humankind's changing understanding of human nature: from Plato and Aristotle's belief that humans had 'natural ends' to the ideals of utopians and dictators of the modern

age who sought to remake humankind for ideological ends. Fukuyama argues that the ability to manipulate the DNA of all of one person's descendants will have profound, and potentially terrible, consequences for our political order, even if undertaken with the best of intentions.²²

C.S. Lewis, the British apologist and one of the greatest thinkers of the 20th century, similarly wrote already in 1943 in *The Abolition of Man*:

"In reality, of course, if any one age really attains, by eugenics and scientific education, the power to make its descendants what it pleases, all men who live after it are the patients of that power. ... But then within this master generation (itself an infinitesimal minority of the species) the power will be exercised by a minority smaller still. Man's conquest of Nature, if the dreams of some scientific planners are realized, means the rule of a few hundreds of men over billions upon billions of men. ... The final stage is come when Man by eugenics, by pre-natal conditioning, and by an education and propaganda based on a perfect applied psychology, has obtained full control over himself. Human nature will be the last part of Nature to surrender to Man. The battle will then be won."²³

And Leon Kass, who chaired the US President's Council on Bioethics (the major commission in the field of bioethics in the US) from 2001 to 2005, emphasized the importance of these questions in an interview:

"All of the boundaries are up for grabs. All of the boundaries that have defined us as human beings, boundaries between a human being and an animal and between a human being and a super human being or a god. The boundaries of life, the boundaries of death. The normal human relations that are founded upon the ties born of sexual reproduction, as a result of which every child is the fusion of two lines going back to time immemorial. We may be able to do new things, but it will no longer be clear who is the 'we' doing them – whether enhancing athletes' bodies through steroids, changing who you are with euphorants, moving the maximum life expectancy out so that one no longer lives with the vision of one's finitude as a guide to how one chooses to spend one's days, or blurring that ultimate line of what is a human being and what is an animal. These questions are the questions of the 21st century and nothing is more important."²⁴

The responses noted meander between overly optimistic and deeply pessimistic. We are convinced of the value of, and need for a more nuanced approach. In Europe and elsewhere there is a growing awareness that we may be equally wrong in demonizing converging technologies and portraying them as 'technological molochs' which cannot be halted, as in hailing them as the panacea to all problems connected to the *condition humaine*. In 2006, the European Community organized a workshop on the new converging

technologies under the title 'Converging Technologies in the 21st Century: Heaven, Hell, or Down to Earth?'²⁵ Given the fact that many debates focus on the extremes, the suggestion to bring the discussion 'down to earth' and to explore the golden middle road of sober-minded and realistic reflection was a valuable one. Converging technologies provide us with great power, but like so many technologies before, do not come with a user's manual. This gives our present-day generation the responsibility to reflect wisely and soberly, with regard both to the factual possibilities and risks of these technologies, and to the objectives and intentions that motivate and direct their development. The risks and dangers should not be exaggerated; but neither should their potential blessings and breakthroughs.

3.4. Human Enhancement Terminology

'Human enhancement' is a loaded and somewhat confusing term. Anyone who observes the discussions will notice the absence of agreement on the precise meaning of the term 'human enhancement.' To some, 'human enhancement' refers to *any* attempt to make human life more liveable, comfortable, and healthy; to others, the term is restricted to attempts to make substantial and lasting changes to the human species beyond what is today considered 'normal' and 'natural.' Beyond this, there are also deep differences about what can be expected and achieved in the future by means of new technologies.

On the one hand are the transhumanists who stress the dawn of a new species of superhumans; on the other hand doomsday prophets who predict the demise of the existing human species. Interestingly, despite their radically different messages, the extremes seem to agree that converging technologies mark a dramatic shift in humankind's history. This shared assumption may have to be challenged. To be sure, the technological developments are there. Some of them are impressive, and no doubt more breakthroughs will follow. But the assumption that converging technologies will radically alter the fate and identity of humankind, for better or worse, may be a bit too much of a tribute to humans.

When we use the term, 'human enhancement' in a more modest way, however, the question is: why use it at all? The CEC discussion document describes human enhancement as "ways to make functional changes to human characteristics, abilities, emotions and capacities, beyond what we regard today as normal, using advances in biology, chemistry, physics, materials, information technology and the mind sciences."²⁶ According to yet another, broader definition, human enhancement refers to "any attempt to temporarily or permanently overcome the current limitations of the human body through natural or artificial means."²⁷

In both cases, questions are in place. With regard to the 'broader definition,' the question

is: what's new? Have humans not *always*, throughout history, attempted to 'make functional changes to human abilities'? Have they not continually tried to 'overcome the current limitations of the human body through natural or artificial means?' In a certain respect there is little new in the aspirations of humans to improve their strength, lifetime, achievements, etc. What is the use of redescribing all these attempts in terms of human enhancement? And, with regard to the CEC definition: how realistic is it to expect that humans will be able to make structural and lasting enhancements to members of their own species, i.e. changes that do not fall within the range of capacities already present in some exceptionally talented human beings? Transhumanists claim that it is possible to transcend our present biological limitations by increasing our intellectual, physical and psychological capacities. They proclaim that humanity is at the threshold of an 'extreme makeover' which may include many kinds of improvements, from a superhuman IQ to enhanced senses and increased muscular power, and from the use of body-machine interfaces to the global use of germ line genetic modification. These predictions should at least be rated as speculative and questionable.

Historically, humans have certainly made drastic improvements in their living conditions. Mortality rates in developed countries have plummeted; life expectancy continues to go up; the people's average height has gone up by almost a foot compared to that in the Middle Ages; the level of education is higher than ever before; numerous technological developments continue to widen the range of possible courses for human activity. However, all these improvements have to do more with changing conditions and circumstances, than with changing the 'essence' of humans. And there are no indications that this progress in technical improvements is connected to changes in the human genome in any major way.²⁸

Of course, changes in the human genome may occur. Many Christians are convinced that God has used evolution as the primary tool to create life,²⁹ and He may continue to use evolutionary processes to enhance his creation. At the same time some people may be sceptical of the 'enhancement-claim.' Have not some of the greatest atrocities in history occurred in the recent history of modern humankind, and could this not be indicative of a moral degeneration of the human species rather than an evolution for the better? Are we, by taking care so well of people with genetic deformities, not eliminating evolutionary mechanisms, and could this not mean that the genome of the human species will, on average, deteriorate rather than improve? Such arguments may or may not be conclusive; they may not even stand the test of scrutiny; but they have to be seriously considered.

In all of history so far, the focus in medicine and in medical science was on restoring deficiencies in the physical and mental health of humans up to a 'normal' or 'natural' level. Most of the medications we use and the surgery we undergo are directed at this

aim. When we wish someone a 'speedy recovery' or pray that she may 'get better,' what we do is to express the hope that her natural, healthy functioning will be restored. There has also been a strong emphasis on preventing deficiencies. By using folic acid and refraining from an unhealthy lifestyle, women hope to protect an embryo from developing genetic deformities. Couples with an increased risk of hereditary diseases may want to prevent the birth of a severely handicapped child, either by refraining from getting pregnant altogether, by using pre-implantation diagnostics for selecting a healthy embryo, or by using prenatal diagnosis in order to be able to end the pregnancy of a child with a handicap. The latter options – selecting existing human life – poses ethical questions which we will come back to below. However, in all these cases the aim is not to improve or enhance humans beyond what falls more or less within the range of our 'natural' capacities.

All these examples illustrate the history of humankind with its focus on restoration or prevention of deficiencies in human health. This is a crucially different attitude from the intention to improve humans beyond their natural capabilities. The term 'human enhancement' seems to feature in public and ethical discussions rather than in the natural sciences. In our observation, 'human enhancement' hardly occurs in scientific publications – whether in research proposals or in publications on the results of scientific research. No doubt, scientists have an interest in portraying the potential results of their future research in terms of the best possible outcome. In public opinion such aspirations are sometimes mistaken for sound predictions, and 'ambitions of scientists' for 'scientific expectations.' The reality of headlines is sometimes a different one from that of the laboratory.³⁰ Apart from financial and communicative factors there is, to finish, the fact that anyone, even the most renowned scientist, has only limited knowledge about what the future holds. Just like those of politicians, economists and bank managers, the expectations of scientists may also to some extent be subject to error and be blurred by personal hopes and fantasies, some of which may be more realistic than others.

3.5. Human Enhancement: Ethics and Theology

The 'Human Fault'

How do we ethically and theologically evaluate human enhancement and these converging technologies? We start with a topic to which any theology must pay attention: the reality and tragedy of human failure. The building of the tower of Babel is an ancient paradigm of humans trying to deal with the *condition humaine*. Genesis 11 describes the aspiration of humans to build a tower that reaches into the heavens: "Then they said, come, let us build ourselves a city, with a tower that reaches to the heavens, so that we may make a name for ourselves; otherwise we will be scattered over the face of the whole earth. [...]" We all know the outcome. Humanity's unity is destroyed and their worst fear comes true as they become scattered over the face of the earth. In the narrative, there is

an implicit criticism of the human aspirations: "But the LORD *came down* to see the city and the tower the people were building".³¹ The tower had already reached a considerable height. Humans believed they were close to reaching the heavens. The text, however, soberly remarks that God still had to come down. The striking element of this story is not the height of the tower. The narrative is not about the construction of a skyscraper. It is about the mistaken ambitions of the ancient Babylonians that they could reach into the skies. It is about humans who wanted to 'make a name for themselves'; afraid of being without relevance, afraid of getting lost.

In a similar fashion we should ask: what are the questions to which human enhancement intends to provide answers and solutions? What is transhumanism's analysis of the *condition humaine*? According to the famous American theologian Reinhold Niebuhr, any theology which ignores the human capacity and propensity to do wrong is deficient and unrealistic. The recognition that humans are sinners and need redemption is at the core of Christian beliefs.³² From this perspective, utopian dreams are unrealistic and dangerous, not because they overestimate the technical possibilities of humankind, but rather because they naively assume that humans will straightforwardly use technology for the benefit of humankind and of the whole creation. Humans, however, are prone to selfishness and sin, and they suffer from conflicting interests, pain, scarcity, tragedy, and finitude. In the Christian tradition, the evils caused by external factors such as natural disasters are called 'natural evils', whereas evils that result from deliberate human choices are called 'moral evils'. The Christian tradition is unanimous that moral evil constitutes the deepest problem for humankind.

It is a sad truth that anything that exists will at some point be object of abuse. This includes things that in themselves are not morally wrong and may even be intrinsically good – knives, fire, computers, nuclear energy, anesthetics, governmental power – even love. According to St. Augustine, however, nothing that exists in the world can intrinsically, i.e. in itself, be bad. Something only becomes wrong when it is used for pursuing the wrong objectives. The more complex and highly developed something is, the more detrimental and evil will it become when used wrongly. This is why *moral* evil is so stunningly evil: the most highly developed creatures we know (humans) use the most highly developed characteristics they have (i.e. their wills and their minds) to pursue wrong things. Or they may pursue good things in the wrong order, e.g. by attributing more value to creatures than to the Creator. Some things should be pursued ('enjoyed,' Latin *frui*) for their own sake. Among those are humans and God. Other things are meant to have instrumental value only and should be 'used' (*uti*) instead of 'enjoyed.' Other things can be partly used and partly enjoyed. 'Sin' means that something which is meant to be enjoyed, such as God and fellow human beings, is instead being used as a means for other purposes. God, for example, is then seen as the guarantor of human prosperity; or fellow human beings are

sacrificed for increasing the happiness of oneself. Sin can also mean the reverse: when things meant to be used instrumentally, such as money or power, are seen as goods to be pursued for their own sake. In both cases, sin is synonymous with what Augustine calls, 'wrongly ordered love.'³³

In the Biblical account of Genesis 3, the first sin of human beings is described in terms of 'becoming like God'. In the Garden of Eden, humans have all they need in order to flourish and be happy, to live in accordance with their nature and purpose, and to walk with God their creator. Originally, according to this narrative, there is nothing humans should refrain from. Nothing is intrinsically wrong – except this one thing: pursuing godliness and thus breaking the bond of love, trust, and obedience to the one and only who can be called God. The essence of the first sin is the intention of humans to be like God:

"The serpent said to the woman, "You surely will not die! For God knows that in the day you eat from it your eyes will be opened, and you will be like God, knowing good and evil!"³⁴

Transhumanists with their explicit quest that strives for an eternal life with godly powers do in fact commit the very same original sin, they want to become like God. A good life, to them, is realized when humans, through technological means, can exert hegemony over their own destiny. Christians believe that this claim to hegemony flies in the face of everything we know about the limited place of humans in the universe. True fulfillment resides in a blossoming relationship with God and fellow humans.

According to Aleksandr Solzhenitsyn, the divide between good and evil goes through each and every human heart.³⁵ Human nature is thus highly ambivalent. On the one hand, humans are unique creatures, the only ones that are created 'in the image of God.' Psalm 8 describes them as only 'little lower than God'.³⁶ Each human being has a priceless value and has an 'almost divine' capacity to do good. At the same time, each human being has an inborn and stunningly forceful propensity to make bad and sinful choices.

Although we dare say that this realistic (some would call it 'pessimistic') view of humans is typically Christian, it is not exclusively so. The atheistic philosopher John Gray, for example, affirms systemic sin in each human being and criticizes an all too optimistic confidence in progress.³⁷ The philosopher Martin Heidegger correctly distinguishes two kinds of evil: the adverse consequences of human technology and, more importantly, evil in human nature itself:

"The threat to mankind comes not only from potentially fatally acting machines and technological apparatus. The real threat has already affected man in his nature."³⁸

Awareness of the risk that new technologies may carry adverse consequences, and of the fact that humans may use (or further develop) them for dubious purposes, is therefore not a specific Christian approach. It is part and parcel of any responsible reflection on new technologies.

Human mandates in creation: promoting well-being and dignity

From this focus on the human fault, we now proceed to a more positive approach. Humans hold a special responsibility in God's creation. This becomes clear from the creation narratives. In Genesis 1:28, God blesses humanity and gives it an assignment: 'God said to them, "Be fruitful, multiply, fill the earth, and subdue it. Have dominion over the fish of the sea, over the birds of the sky, and over every living thing that moves on the earth". The Hebrew words used here for 'subdue' and 'have dominion' (שָׁבַד and הִדְרִי, respectively) have in other contexts the meaning of 'bringing into bondage,' 'subdue,' sometimes even 'tread down.' As nature constitutes a challenge to humanity, sometimes even a threat, humans have a cultural assignment to bring it under control and use it to the benefit of themselves and their neighbours. The subsequent chapter of Genesis breathes a more positive view of nature and includes a more explicit cultural commission. In Genesis 2:15 and 18, God assigns humans to 'cultivate and keep' the Garden of Eden. The Hebrew word used for 'cultivating' (דָּבַעַה) is composed of the same root letters from which the words 'servant' and 'slave' are composed. English translations use the term 'serve,' 'work,' 'dress,' or 'farm.' Humans should 'serve' the Garden rather than merely subdue it. The other term used here, 'keeping' (הִרְמִישׁ) stems from the root which means 'guarding,' and 'keep watch.'

Weighing the dialectics of these accounts, Christian thinkers through all ages have interpreted these texts as a calling to responsible stewardship, as a demand to take good care of creation. There is clear consensus that the mandate to take dominion and subdue the world should not be interpreted as a license to exploit or manipulate the earth but as a call to 'keep the garden in good shape.' Humans are called not to subjugate in the sense of imposing their autonomous will, changing creation according to their anthropocentric aspirations, but rather to look after creation and responsibly to discover, use and further release its hidden potentials.

In doing this, humans, created in God's image, are co-creators who consider themselves accountable to God and rejoice in the God-given mandates they have in the world. Servanthood, bearing God's image, and the following of Christ (*imitatio Christi*) come together in the term, stewardship.³⁹ In the light of the human cultural assignment, we can state two criteria for applying converging technologies: (1) do they serve the wellbeing of humans and the creation, and do they refrain from doing harm? and (2), do they respect the dignity of human beings and the integrity of creation?

One of the complexities of linking these theological notions to contemporary ethics is the existence of sharp disagreements on the meaning and content of terms such as harm, wellbeing, dignity and the 'good life.' As Alasdair MacIntyre has argued, there is no longer a shared conception of a common *telos* of human activity.⁴⁰ This should, however, not paralyze us. First, we should not lose sight of the consensus that we have about many basic moral notions.⁴¹ Gratifyingly, there is a broad consensus about the unique value and dignity of each human being, irrespective of their physical and mental capacities.⁴² The first two articles of the Charter of Fundamental Rights of the European Union are illustrative: "Human dignity is inviolable. It must be respected and protected," and "Everyone has the right to life".⁴³ The latter says that we should not kill (or harm) humans, the first that we should respect everyone's dignity. The difference between 'not harming' and 'respecting the dignity' may not be evident at first sight; some people may use them synonymously. But to respect someone's dignity relates to a deeper ontological level of that being than 'not inflicting harm.' Imagine health care professionals ridiculing a comatose patient. Even if they do not inflict physical or psychological harm, they act disrespectfully with regard to his dignity. Respecting someone's dignity thus means to honour and accept her as she is, with her specific identity. This respect can be extended beyond persons: we can respect the identity of animals, a species, and the whole creation.

Christian attitude towards converging technologies

Summing up, we assert that a Christian reflection on converging technologies needs to be geared to three points:

(1) Positive reception and gratitude

The history of science and technology is replete with Christians who have stimulated scientific advancements. Many of those who were actively engaged in exploring nature did so in the conviction that they were exploring God's creation. Johann Kepler's words come to mind when he expressed his motivation to "think God's thoughts after Him." Clearly, Christians have every reason to appreciate science and its achievements. At the same time, they have no reason whatsoever to embrace scientific and overly optimistic expectations. There is no reason why science and technology should be credited with redemptive powers or an aura of infallibility which can in extreme cases fulfill an almost religious function.

There is, we think, much reason to be thankful for the continuing progress made by science and technology. Their achievements should be welcomed as wonderful gifts of God. Not only do they satisfy the curiosity that is typical of humans as exploring and reflective beings that are called to cultivate the earth. They also serve to improve the conditions of human life and to foster God's creation. The achievements of science and technology can be viewed as a Divine gift, a work of the Spirit to prevent and heal sicknesses and

to offer comfort and relief when there is suffering. Some religious people tend to speak about science and technology merely in the sense of being 'allowed', albeit with some reserve, by God.⁴⁴ We think this reserve should make place for enthusiasm and gratitude. Science and technology may be celebrated as forms of activity that justify using words as 'civilization' and 'culture.'

(2) Unwarranted expectations and awareness of the adverse side effects

Converging technologies show promising results and more is to be expected. At the same time, expectations should be phrased with proper scepticism. As with any prediction about future developments, there is neither reason for too high expectations, nor reason to consider recent technological developments as leading to the 'end of Homo sapiens.' Both the sky-high expectations of the transhumanists and the doomsday perspectives of other prophets are mistaken. What should be criticized are not the technologies, but the fears and cheers with which they are surrounded.

Furthermore, we have to be aware of possible adverse side effects of human enhancement technologies. These effects range from effects of converging technologies themselves to the possibilities that humans at some point will use them as instruments for oppression and discrimination.

(3) Motivation: stewardship versus 'becoming like God'

Finally, the construction of the tower of Babel and the Biblical story of the first sin illustrate the human ambition to rise higher than is fitting to our creature status. As indicated above, dreams of a 'superhuman' species are not merely unrealistic; fundamentally, they represent the erroneous ambition to be 'like gods.' The development and use of converging technologies is not to be seen as an attempt to set the destiny of humans and the world. The drive to change the essential characteristics of humans rather than restoring their 'normal,' or 'natural' capacities is irreconcilable with our cultural assignment to act as responsible stewards. Such a stewardship means: developing and applying converging technologies for the benefit of humans and the rest of creation. It implies respect for the dignity of humans, for the way humans are created – their gifts, their potential, their limitations – both as individuals, as communities, and as a species.

3.6. Genetic Screening as an Illustration

Let us illustrate how this normative framework may work by referring to prenatal genetic screening as an example. In the fields of genetic diagnosis and genetic modification huge progress has been made in recent decades. Many moral and political questions have arisen: under what conditions would we accept genetic modification of crops, animals, and humans? What is our view on selecting embryos for implantation? What about abortion if

a prenatal test indicates the presence of a mild handicap, such as a cleft lip (*cheiloschisis*) and a cleft palate? What is our view of human cloning?

We propose to take *human dignity* as our normative starting point. Human dignity represents a value which transcends competing values such as economic efficiency and free scientific research. Christians are convinced that *Homo sapiens*, despite its evident biological kinship and evolutionary history, differs fundamentally from other species, because humans were created in God's image. Although Christians believe that the entire creation needs redemption, the primary reason for Christ's incarnation was the fall of humans and their need of redemption. From the early church on, Christians have proclaimed the dignity of each human being. Free or enslaved, male or female, rich or poor, powerful or oppressed, Jew or Gentile, every person was assumed to have an equal and inalienable dignity. From the first centuries, Christians were engaged in taking care of the poor, widows and orphans, deformed people, in fighting infanticide and in improving the position of women.⁴⁵ This affirmation of the human dignity has always implied the firm rejection of practices and convictions which were demeaning to humans.

Human dignity is no ivory tower concept and is found in what Tolstoy calls 'real life': everyday life in all its fragility and concreteness. This is a life which, through the awareness of human need, limitations, and mortality, finds its way towards commitment, depth, beauty, virtue, and meaning; not despite, but rather in and through our fragility and bodyliness.⁴⁶ The most important question with regard to converging technologies is not whether or not they should be discarded altogether – clearly, they shouldn't. Neither is it a question whether we should be aware of their potential risks – clearly, we should. The crucial question is what these technologies will do to us humans: to our anthropology, our solidarity, our sense of self-esteem, and our respect for the equal dignity of all. Some of the ends and means propagated by transhumanists may indeed pose a threat to this dignity. It remains to be seen whether humanity can ever be genetically 'enhanced'. But even if this were the case, the persons involved would not be more humane, more valuable, or more dignified. To begin with, every human being already has a dignity that is beyond compare.

In the meantime, the focus on human enhancement could work in the opposite direction, yielding a society which may become more *inhumane* than it was. Irrespective of the question whether converging technologies will lead to healthier, more good-looking and more intelligent humans, the continuous focus on improving ourselves may induce disregard or contempt for the less talented. The eugenics and the dystopia of *Brave New World* will hopefully never come true. But some of its oppressive mechanisms may. Of course, 'eugenics' is an emotionally charged term, connected as it is to a past of racial selection and genocide.⁴⁷ Despite the fact that eugenics in those horrific dimensions does not apply here, the modern vocabulary of 'enhancing' and 'improving' humans

does in fact distinguish between different classes of people. On a small scale, selection already occurs at life's beginning. That this happens in the context of hereditary diseases connected with very severe suffering and a short life expectancy of a child, can be better understood than when the presence of 'mild' handicaps, such as Down syndrome, leads to abortion. In the near future, the number of genetic diseases which can be found during a pregnancy will rapidly go up. Since hardly any of these disorders can be treated, let alone cured, selective abortion may for an increasing number of parents-to-be become the 'default solution' to the presence of a hereditary disease. For clinical geneticists it may also become harder to resist societal pressures to include the testing of other characteristics, such as sex, IQ, predisposition for certain traits of character, etc.⁴⁸

Perhaps the most important objection to this medicalization of human procreation is that children will increasingly become a 'parental project' for whose genetic quality the parents are considered to bear responsibility. The question is how this relates to viewing a child as a result of a loving relationship, and as a Divine gift received in gratitude and, ultimately, how this relates to the dignity of their offspring. Author and editor of *Nature* Oliver Morton sketched the possible 'consumer's attitude' towards having children:

A couple goes to a clinic and provides some sperm and some eggs. The clinic turns them into embryos and analyzes the different mixtures of the parents' genes each embryo carries. The parents are given the embryos' genetic profiles and advice on how the genes relate to various traits, both physical and mental, in various different conditions. At present, such a profile would be expensive and crude, capable of spotting genes for serious genetic disabilities but not much more. But with better DNA-analysis tools and much more knowledge about which genes do what – both fields that are growing exponentially – the pictures will get sharper and sharper. The parents choose the profile they like, on whatever criteria appeal to them; the chosen embryo is grown a bit further in the test tube, a few cells are snipped out to provide tissue for repairs in later life, and then the pregnancy gets under way.⁴⁹

Again, apart from the factual question whether or not we will at some point be technically able to design our own offspring and improve its genetic quality, we need to ask whether we truly want to pursue these techniques. Suppose that we can be sure that future developments will be well-monitored and controlled, and suppose that we can be reasonably certain that no major side-effects will occur. Even in that case, we may still ask ourselves: do we, as humans and as religious persons, wish to carry this kind of responsibility? Of course, humans have taken all kinds of measures in the past to take influence on their offspring: choosing a suitable partner, contraception, IVF, etc. Still, to what extent is it acceptable that children materialize the dreams of would-be parents? What will be the consequences for intergenerational relationships, for the self-understanding

of children, and for the respect of children for their parents? Would 'designer babies' not in the end represent a refusal to accept new life 'as it comes'? Although it is hard to draw the exact lines, being a creature means that there are things humans should not pursue, because they are creatures, not the Creator – humans, not God.

3.7. Living a Human Life

Health is a top priority of citizens in industrialized countries. We long for a good, preferably long, life. Not all of us may want to live eternally; but many of us would like to live longer, with a body that is as youngish as possible. We want to improve our lives and the conditions surrounding it and have every reason to do so: even in highly developed countries with advanced health care systems, life continues to be burdened with suffering, tragedy, and discomfort. Progress and prosperity are fragile and under continuous threat. The cultural mandate of humankind has lost nothing of its urgency.

Nevertheless, we should also ask ourselves whether the quest for human enhancement addresses the most pressing problems of humanity, and whether technologies will be able to provide effective solutions. Humankind's basic problem does not consist in our bodily or mental limitations but is, so we think, at bottom moral and spiritual. Yes, technologies do improve the quality of our lives. However, the bittersweet truth is that it is in fact suffering, scarcity, limitations, and tragedy – in short: the *condition humaine* – that sometimes lead to our deepest flourishing. Occasionally human values are realized despite the presence of suffering; on other occasions, the realization of these values even seems to need a certain amount of adversity: love, patience, self-denial, heroism, discipline, piety.

This is wonderfully illustrated in *Brave New World*, where Huxley describes the conversation between Mustapha Mond, one of the administrators of the new world, and a so-called savage. The latter represents the few remaining natural humans who have not been psychologically modified, do not use *soma*-drugs, and who live in a reserve:

The savage said, "But God's the reason for everything noble and fine and heroic. If you had a God."

"My dear young friend," said Mustapha Mond, "civilization has absolutely no need of nobility or heroism. These things are symptoms of political inefficiency. In a properly organized society like ours, nobody has any opportunities for being noble or heroic. Conditions have got to be thoroughly unstable before the occasion can arise. Where there are wars, where there are divided allegiances, where there are temptations to be resisted, objects of love to be fought for or defended – there, obviously, nobility and heroism have some sense. But there aren't any wars nowadays. The greatest care is taken to prevent you from loving any one too much. There's no such thing as a divided allegiance; you're so conditioned that

you can't help doing what you ought to do. And what you ought to do is on the whole so pleasant, so many of the natural impulses are allowed free play, that there really aren't any temptations to resist. And if ever, by some unlucky chance, anything unpleasant should somehow happen, why, there's always soma to give you a holiday from the facts. And there's always soma to calm your anger, to reconcile you to your enemies, to make you patient and long-suffering. In the past you could only accomplish these things by making a great effort and after years of hard moral training. Now, you swallow two or three half-gram tablets, and there you are. Anybody can be virtuous now. You can carry at least half your morality about in a bottle. Christianity without tears – that's what soma is."
[The savage protests:] "But the tears are necessary [...] You just abolish the slings and arrows. It's too easy."

"We don't," said the Controller. "We prefer to do things comfortably."

"But I don't want comfort. I want God, I want poetry, I want real danger, I want freedom, I want goodness. I want sin."

"In fact," said Mustapha Mond, "you're claiming the right to be unhappy."

"All right then," said the Savage defiantly, "I'm claiming the right to be unhappy. Not to mention the right to grow old and ugly and impotent; the right to have syphilis and cancer; the right to have too little to eat; the right to be lousy; the right to live in constant apprehension of what may happen tomorrow; the right to catch typhoid; the right to be tortured by unspeakable pains of every kind." There was a long silence.

"I claim them all," said the Savage at last.⁵⁰

This fragment sketches an interesting contrast. On the one hand we recognize the idealistic view of the administrator of *Brave New World* who opts for a fully controlled society in which human needs and interests have been satisfied at the expense of true humanity. On the other hand there is the passionate longing of the savage for authenticity and true virtue. Most people will feel sympathy for the latter's rather intuitive longing. However, as Mustapha Mond observes, all these qualities come in one package with the discomforts of ageing, illness, starvation, fear, and pain. In a world that is broken as a consequence of human sin, the one cannot be reached without the other.

We may develop all kinds of techniques to make life swifter, healthier, longer, and more pleasant. It is understandable that some want to call that 'human enhancement.' We agree with regard to the point that science and technology have a continuous responsibility to improve the circumstances in which humans live, to find treatments for diseases, and to prevent suffering. If this is what is meant by 'human enhancement,' this chapter is a passionate plea in favour of it. True human enhancement, however, can only occur at the level of moral virtue and a pious relationship with the living God.

- ¹ Parts of this paper were published previously as Cees Dekker, "Naar een Brave New World?" in: Cees Dekker, René van Woudenberg, and Gijsbert van den Brink (eds.), *Omhoog kijken in platland. Over geloven in de wetenschap*, Kampen: Ten Have, 2007.
- ² Michael Anissimov, "Brilliant minds forecast the next 50 years," in: *New Scientist* 2578 (18/11/2006), <http://www.acceleratingfuture.com/michael/blog/2006/11/newscientistcom-brilliant-minds-forecast-the-next-50-years>.
- ³ The quotations stem from R. Gosden, E. Heber-Katz, J. Halpern, C. Koch, F. Gage, P. Zimbardo, R. Kurzweil, and E. Loftus, respectively.
See http://www.brainbasedbusiness.com/2006/12/85_brainy_people_predict_the_n_1.html
- ⁴ Aldous Huxley, *Brave New World*, New York: HarperCollins, 1932.
- ⁵ See the preface written by Huxley in the 1947 edition of *Brave New World*. Cf. Aldous Huxley, *Brave New World Revisited*, New York: HarperCollins, 1958.
- ⁶ Cf. J.H. Koeman, C. Dekker *et al.*, *Hoe groot kan klein zijn? Enkele kanttekeningen bij onderzoek op nanometerschaal en mogelijke gevolgen van nanotechnologie*. Report of the Royal Dutch Academy of Sciences, Amsterdam: KNAW, 2004.
- ⁷ [Http://www.entnet.org/HealthInformation/cochlearImplants.cfm](http://www.entnet.org/HealthInformation/cochlearImplants.cfm). Last visited on April 1, 2013.
- ⁸ M.S. Humayun *et al.*, "Pattern Electrical Stimulation of the Human Retina," in: *Vision Research* 39 (1999) pp. 2569-76; M. Javaheri *et al.*, "Retinal Prostheses for the Blind," in: *Annals Academy of Medicine Singapore* 35 (2006), pp. 137-44.
- ⁹ [Http://en.wikipedia.org/wiki/Retinal_implant](http://en.wikipedia.org/wiki/Retinal_implant). Last visited on April 1, 2013.
- ¹⁰ R.H. Hochberg *et al.*, "Neuronal Ensemble Control of Prosthetic Devices by a Human with Tetraplegia," in: *Nature* 442 (2006), pp. 164-71.
- ¹¹ S.K. Talwar *et al.*, "Behavioural Neuroscience. Rat Navigation Guided by Remote Control," in: *Nature* 417 (2002), pp. 27-38.
- ¹² Cf. Cees Dekker, "De moleculaire nanotechnologie van het leven," in: Cees Dekker, Ronald Meester and René van Woudenberg (eds.), *Schitterend ongeluk of sporen of ontwerp?* Baarn: Ten Have, 2005, pp. 117-33.
- ¹³ Cf. Huub de Vriend, *Constructing Life: Early Social Reflections on the Emerging Field of Synthetic Biology*, Rathenau Instituut Werkdocument 97, Den Haag: Rathenau Instituut, 2006.
- ¹⁴ D. Endy, "Foundations for Engineering Biology," in: *Nature* 438 (2005), pp. 449-53; D. Endy and R. Brent, "Modelling Cellular Behavior," in: *Nature* 409 (2001), pp. 391-5.
- ¹⁵ [Http://www.nature.com/news/brain-simulation-and-graphene-projects-win-billion-euro-competition-1.12291](http://www.nature.com/news/brain-simulation-and-graphene-projects-win-billion-euro-competition-1.12291)
- ¹⁶ [Http://tudelft.nl/en/current/latest-news/article/detail/investeren-van-51-miljoen-euro-voor-nanowetenschap-in-delft-en-leiden](http://tudelft.nl/en/current/latest-news/article/detail/investeren-van-51-miljoen-euro-voor-nanowetenschap-in-delft-en-leiden). Last visited on April 1, 2013.
- ¹⁷ For a range of Jewish and Christian views, cf. Leon R. Kass, *Life, Liberty, and the Defense of Dignity: The Challenge for Bioethics*, San Francisco: Encounter Books, 2002; C.W. Colson and Nigel de M.S. Cameron, *Human Dignity in the Biotech Century*, Downers Grove: InterVarsity Press, 2004; N. Postman, *Technopoly*, New York: Vintage Books, 1993; W.J. Smith, *A Consumers Guide to Brave New World*, San Francisco: Encounter Books, 2004; J. J. Walter and T.A. Shannon, *Contemporary Issues in Bioethics: A Catholic Perspective*, Lanham: Rowman & Littlefield, 2005.
- ¹⁸ M.C. Roco and W.S. Bainbridge (eds.), *Converging Technologies for Improving Human Performance: Nanotechnology, Biotechnology, Information Science and Cognitive Science*, Arlington: NSF/DOC, 2002.
- ¹⁹ Cf. N. Bostrom, "A History of Transhumanist Thought," in: *Journal of Evolution and Technology* 14 (2005); R. Kurzweil, *The Age of Intelligent Machines*, Cambridge, Mass.: MIT Press, 1990; R. Kurzweil, *The Singularity Is Near: When Humans Transcend Biology*, New York: Viking, 2005.
- ²⁰ W.N. Joy, "Why the Future Does Not Need Us," in: *Wired* 8.04 (2000).

- ²¹ Martin Rees, *Our Final Century: Will the Human Race Survive the Twenty-first Century?* London: William Heinemann, 2003.
- ²² Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnology Revolution*, New York: Farrar, Straus and Giroux, 2002. Cf. http://en.wikipedia.org/wiki/Our_Posthuman_Future.
- ²³ C.S. Lewis, *The Abolition of Man*, Oxford: Oxford University Press, 1943. For a more recent discussion on the theme, cf. P. Kreeft, *C.S. Lewis for the Third Millennium*, San Francisco: Ignatius Press, 1994.
- ²⁴ Leon Kass quoted in W.J. Smith, *A Consumers Guide to Brave New World*, San Francisco: Encounter Books, 2004, p. xi.
- ²⁵ STOA workshop, *Converging Technologies in the 21st Century. Heaven, Hell, or Down to Earth?* 27/6/2006, Brussels: European Parliament. This title was inspired by the book of J. Garreau, *Radical Evolution*, New York: Broadway Books, 2005.
- ²⁶ http://csc.ceceurope.org/fileadmin/filer/csc/Ethics_Biotechnology/Human_Enhancement_March_10.pdf , 7.
- ²⁷ [Http://en.wikipedia.org/wiki/Human_enhancement](http://en.wikipedia.org/wiki/Human_enhancement).
- ²⁸ What may well have been changed recently is the percentage of children born with hereditary diseases. But that does not address the question whether the range of what 'healthy' humans, as humans, are able to perform, has changed correspondingly.
- ²⁹ Cf. Cees Dekker, "Uit wat ik ben en was," in: Cees Dekker (ed.), *Geleerd en Gelovig. 22 wetenschappers over hun leven, werk en God*, Utrecht: Ten Have, 2008, pp. 316-36.
- ³⁰ From the late 1990s on, stem cell research with human embryos in combination with nuclear transfer ('cloning') was presented as a potential treatment, if not cure, for degenerative, age-related diseases: Alzheimer's, Parkinson's, diabetes. Not only has the development of these applications proven to be harder than expected, but also have we seen a shift of the public debate away from pursuing the development of life-prolonging technology towards the acceptance, and even welcoming, of a not-too-late natural death.
- ³¹ Gen. 11: 4-5, *NASB. Italics ours*.
- ³² Reinhold Niebuhr, *An Interpretation of Christian Ethics*, San Francisco: Harper 1963.
- ³³ Cf. John Philip Wogaman, *Christian Ethics: A Historical Introduction*, 2nd edition, Louisville: Westminster John Knox Press, 2011, pp. 53ff.; Gerrit de Kruijf, *Ethiek onderweg. Acht adviezen*, Zoetermeer: Meinema, 2008, p. 75.
- ³⁴ Gen. 3:4.
- ³⁵ A. Solzhenitsyn, *The Gulag Archipelago*, New York: Harper & Row, 1973, p. 168.
- ³⁶ Psalm 8:5, *NASB*.
- ³⁷ John Gray, *Heresies, Against Progress and Other Illusions*, Londen: Granta Publications, 2004.
- ³⁸ Martin Heidegger, *Basic Writings*, New York: Harper & Row 1957, p. 399.
- ³⁹ Cf. Theo A. Boer, (ed.), *Schepper naast God? Theologie, bio-ethics and pluralisme. Essays aangeboden aan Egbert Schroten*, Assen: Van Gorcum, 2004.
- ⁴⁰ Alasdair MacIntyre, *After Virtue*, 2nd ed., Notre Dame: University of Notre Dame Press, 1984.
- ⁴¹ John Rawls speaks here of 'overlapping consensus.' John Rawls, *A Theory of Justice*, Cambridge, Massachusetts: Harvard University Press, 1971.
- ⁴² Cf. Fukuyama, *Our Posthuman Future*.
- ⁴³ *Charter on Fundamental Rights of the European Union*, op 7/12/2000, signed by the Member States, and ratified by the European Parliament, the Council of Europe, and the European Commission. http://www.europarl.europa.eu/charter/pdf/text_en.pdf
- ⁴⁴ Cf. Reinhold Niebuhr's depiction of the attitude of some Christians to culture ("Christ against Culture") in Reinhold Niebuhr, *Christ and Culture*, San Francisco: Harper 1951.

- ⁴⁵ For an overview of the positive role of Christianity in culture, cf. Alvin J. Schmidt, *Under the Influence*, Grand Rapids: Zondervan, 2001; Rodney Stark, *The Victory of Reason*, New York: Random House, 2005; Theo Boer and Stef Groenewoud, *Vroegchristelijke denkers en hedendaagse morele zorgdilemma's*, Den Haag: ZonMW, 2011.
- ⁴⁶ Kass, *Life, Liberty, and the Defense of Dignity*, p. 18.
- ⁴⁷ Practices and ideas from eugenics were not confined to Nazi-Germany. Before World War II, eugenics was as popular in scientific circles in the United States as it was in Germany. See, for example, Ian Dowbiggin, *A Merciful End. The Euthanasia Movement in Modern America*, New York: Oxford University Press, 2007.
- ⁴⁸ We should be aware of the many technical hindrances. The fact that the human genome has been mapped, does not in any way mean that we know how a certain genetic profile is connected to, say, intelligence. A simple one gene-one trait picture is definitely incorrect. Much future research is needed to establish the complex relation between genetic profile and traits.
- ⁴⁹ Oliver Morton, "Overcoming Yuk," in: *Wired* 6.01 (1998).
[Http://www.wired.com/wired/archive/6.01/morton.html](http://www.wired.com/wired/archive/6.01/morton.html) (last visited January, 2013)
- ⁵⁰ Huxley, *Brave New World*, chapter 17.



Chapter 4

HUMAN ENHANCEMENT

by Christopher Coenen

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Largely based on the results of a research project conducted on behalf of the European Parliament, and taking into account the results of a research project funded by the European Commission, European discourse and governance activities on human enhancement are described and analysed. This includes a discussion of conceptual challenges and policy options, as well as short descriptions of relevant governance activities in Europe. Furthermore, the significance of the topic of human enhancement for the Christian religion and Christian contributions to discourse on the topic are briefly discussed. It is argued that discourse on human enhancement suffers from an ideological imbalance that is detrimental to certain religious criticisms of human enhancement.

4.1. European Discourse and Governance Activities on Human Enhancement

The umbrella term, 'human enhancement' refers to a wide range of existing, emerging and future technologies, including pharmaceutical products¹: some examples are neuroimplants that provide replacement sight or other artificial senses; drugs that boost brain power; human germline engineering and existing reproductive technologies; nutritional supplements; new brain stimulation technologies to alleviate suffering and to control mood; gene doping in sports; cosmetic surgery; growth hormones for children of short stature; anti-ageing medication, and highly sophisticated prosthetic applications that may provide specialised sensory input or mechanical output. All these technologies signal the blurring of boundaries between restorative therapy and interventions that aim to bring about improvements extending beyond such therapy.

A project on human enhancement led by the Institute for Technology Assessment and Systems Analysis (ITAS) within the Karlsruhe Institute of Technology (KIT) and carried out on behalf of the Science and Technology Options Assessment (STOA) panel of the European Parliament in the late 2000s (see Acknowledgements at the end of the chapter) had three major tasks: first, and most fundamentally, we wanted to propose a notion of human enhancement and of human enhancement technologies (henceforth HET) which would be viable in a policy context and would do justice to the complexity of the issue. Our second goal was to paint a realistic picture of the issue of human enhancement and of its prospects in the near future. This needed to include the state of the art in selected human enhancement technologies and a rather wide range of social, ethical, political

and cultural aspects which have an impact on the development and public acceptance of these technologies. Our final and main goal was to develop recommendations on how policy-makers in Europe could tackle the issue of human enhancement despite its numerous facets and related pitfalls.

As regards the notion of human enhancement, we felt that existing concepts are often either not very useful in a policy context or oversimplify certain aspects of human enhancement. We therefore conducted a literature study on conceptual questions and their intricacies and staged an expert meeting which discussed such questions with regard to diverse challenges to the social, disability, medical and ethical frameworks raised by human enhancement. Both the literature study and the meeting helped us to carve out a notion of human enhancement which, in our view, can serve as a concept in policy-making and avoids some of the pitfalls related to this issue.

In developing our definition of human enhancement, we did not rely on widespread and very broad notions of enhancement which include a variety of means to improve performance or the lot of humankind, including early forms of drug use, education and even physical exercise. We would hold that such anthropological notions of human enhancement are not suitable for application in a policy context. On the other hand, we distanced ourselves from those equally widespread notions of enhancement which more or less rigidly dichotomise enhancement and therapy. The main reason why one should avoid this dichotomy in a policy context is the fact that it is often related to ethically and politically questionable notions of health, disability and so on – and does not even enable us to make clear distinctions in specific cases. One example are people such as the South African athlete Oscar Pistorius who have been provided with artificial legs and are now able to outperform people with their own legs in sports such as running.

Nevertheless, in a policy context at least, the distinction between therapeutic and non-therapeutic interventions should not be abandoned, if only for the pragmatic reason that one needs to decide which interventions should be paid for by health insurance companies and which should not. We therefore defined human enhancement as any modification aimed at improving individual human performance and brought about by science-based or technology-based interventions in the human body. We also distinguished between (i) restorative or preventive, non-enhancing interventions, (ii) therapeutic enhancements and (iii) non-therapeutic enhancements. Human enhancement can be seen as primarily offering a specific perspective on developments in science, technology, medicine and society, and as being a cultural and social phenomenon. The effects of human enhancement technologies can be either long term or indeed permanent (as in the case of genetic enhancements), or temporary (such as improved concentration levels brought about by drugs). The aim may be to improve our natural abilities (for example by making us

stronger or happier) or to give us characteristics or abilities that no human being has ever possessed before, such as full night vision, or even extra senses. This definition fits well with notions of enhancement which have been used in a European Union (EU) policy context in recent years (see below).

Certain social groups, segments and institutions of society, and cultural practices appear to be of specific interest regarding the relevance of new and emerging HET. This includes, for example, the areas of body-building – which is arguably a ‘testing ground’ for HET at least as important as elite sports. It also includes anti-ageing and wellness medicine – with its propinquity to cosmetic surgery as well as to visionary discourses on life extension. And, finally, cultural practices are relevant which focus on body modifications – starting with tattooing and piercing but extending to radical transformations of the human body in performance arts and certain cultural movements. Moreover, disabled people and soldiers – in particular veterans who lost bodily functions or suffer from psychological problems – can be deemed main target groups of cutting-edge HET. And, as a matter of course, many people with severe illnesses or health problems are the targets of interventions which could be used for non-therapeutic enhancements as well.

We excluded from our definition all improvements of human performance which are realised by the use of devices which are not implanted or not robustly fixed to the body. Under societal aspects and as alternatives to body-interventionist technologies, such external devices are nevertheless important points of reference. A few of these technologies might even be used in the entertainment context, such as in the case of uses of brain-computer interfaces by the game industry which to a certain extent have already become established in this industry as body-external devices. In our view, exoprostheses and any other assistive devices outside the body which are in almost continuous use, are functional elements of human corporeality, regardless of their non-biological character, and thereby enhance human performance in a way that is more similar to human enhancement than to the ordinary use of artefacts. At least insofar they give their users species-atypical abilities or allow for super-human performance, they deserve attention in this context. The same holds true for externally worn devices that enable users to control machines (e.g. robots) or to act in ‘virtual’ surroundings or ‘worlds’ (e.g. games or flight simulations). Eventually, these technologies may create an interest in, or prepare society and individuals for the use of HET, as it is already the case with athletes and body-builders who use advanced methods of doping, with some academics who understand themselves as ‘first cyborgs,’ and with a small cultural movement that self-experiments, mainly outside medical or academic contexts, with ‘intelligent’ implants. Ultimately, implants and other HET might in fact become more widely attractive – at least for some social groups if the risks of their use appear to be outmatched by the advantages.

In order to obtain as encompassing and differentiated a picture of the issue of human enhancement as possible, we then conducted a literature study on the state of the art in selected fields of HET as well as four in-depth case studies on gene therapy and gene doping, on designer babies, on Ritalin, and on deep brain stimulation. Moreover, another expert meeting was organised to discuss our preliminary findings and the views of experts in pertinent fields of research and development and their ethical implications. We therefore looked at a wide variety of HET, at related public, stakeholder and expert discussions, and at social and cultural practices, as well as funding policies relevant in this context. In general, it is our impression – and this is particularly important to note when giving policy advice – that the majority of HET are still therapeutic and do not offer their users significant advantages over ‘non-enhanced’ humans; indeed, the level of improvement is often well below the level of normal function. On the other hand, there are several marked tendencies towards an enhancement society. First, there are realistic prospects of major near-term progress in several fields of research and application; these developments may be significantly accelerated by regulatory and funding measures. Second, in such cases as neuro-enhancing drugs or new reproductive technologies, HET appear to be fairly attractive within the population and to have significant market potential. These so-to-speak bottom-up tendencies towards an enhancement society are in turn fostered by wider socio-economic and cultural trends, as well as by social and economic pressures. This relates, for example, to the medicalisation of society, to the commercialisation of medicine, to fundamental transformations of concepts such as ‘health’, and to new challenges in work life in a globalised economy and even in private life. Finally HET, as well as human enhancement as a public issue, are promoted by several influential and interrelated networks which, particularly in the U.S., include representatives of major players in research, science and technology policy. Given the often highly negative reactions of major stakeholders in Europe, such as many churches, towards the visions of these promoters, there is a risk of a kind of culture war breaking out over the topic of human enhancement.

In our recommendations for the political handling of the human enhancement issue, we distinguished between five strategic options: a *laissez-faire* approach, a total ban on human enhancement technologies, a reasoned pro-enhancement approach, a reasoned restrictive approach and a case-by-case approach. While deeming the first two options not viable, the reactions of the parliamentarians and experts during our workshops showed us that the implementation of any of the three viable strategies should be based on a coherent normative framework as well as on a broad societal deliberation of the issue. The essence of our policy proposal is to set up a temporary European body, within or closely related to the European Parliament, charged with developing a normative framework for human enhancement in order to guide EU policy-making in this field. Our study

suggests two institutional options for such a body: the Parliament could decide to set up a temporary committee, or the Commission could decide to put together a working group comprising members of the Parliament. The remit of such a body would be to further explore the topic and pave the way for possible further regulation of enhancement technologies that are relevant for political domains such as health, sports and research policies. The normative framework should be based on evaluation criteria related to fundamental and uncontroversial values such as autonomy, fairness and the right to physical integrity. It would help (i) to organise a comprehensive impact assessment of HET, (ii) to identify further research needs, (iii) to define the limits within which each country can regulate HET, (iv) to prevent undesirable effects and serious inner-European inequalities, and (v) to inform funding policy committees about the technologies in question and to prompt a broader societal dialogue on the topic as a whole. The mandate of the body could be supported by a range of specific activities, such as a thorough analysis of risks to individuals (such as addiction and the adverse health effects of surgical interventions) and the use of state-of-the-art public participation tools and surveys to learn more about European public opinion concerning the various facets of the issue. As regards the composition of the proposed body, it is important for it to reflect European cultural diversity and the interdisciplinary character of the issue by including representatives from different disciplines and EU Member States. This body would thus not only function as an intermediary between science and technology and EU policy, but would also be a forum where HET could be discussed in the context of European values and history.

By and large, human enhancement is still a topic at the margins of policy discourse and activities in Europe. To a certain extent, this might be explained by the fact that 'human enhancement' is, above all, one specific perspective on developments in science, technology, medicine and society, and does not constitute a real science and technology field. In a project funded by the European Commission (see Acknowledgements), called 'Ethics in Public Policy Making: The Case of Human Enhancement' (EPOCH) and to be completed in 2012, it was one of our tasks to produce an overview of existing policies and governance activities on human enhancement in Europe. For this purpose and based on a broad notion of 'governance', we focused on the interface between policy and academic spheres and, in particular, on policy advice. Accordingly, we took into account (i) policy activities in the narrow sense (such as parliamentary activities), (ii) activities of institutions that regularly give advice to policy makers, (iii) activities of publicly funded institutions or other public bodies that play an important role within the science system (e.g. academies of science) or political system, (iv) all kinds of publicly funded 'accompanying research' activities which explicitly deal with the topic of human enhancement and are conducted in such fields as technology assessment (TA) studies and studies on ethical, legal and societal aspects (ELSA) of relevant new and emerging technologies, and (v) publicly funded 'public dialogue' activities. Other activities were only taken into account if core

actors in the political system or science system participated in them. Furthermore, we restricted ourselves largely to the following European countries: Croatia, Denmark, France, Germany, Italy, the Netherlands, Norway, Poland, Serbia, Slovenia, Spain, Switzerland and the United Kingdom.

Our analysis showed that there are (i) countries in which a large number of activities or high-profile activities are taking place, combined with more or less lively academic discourses on the topic, (ii) countries in which there is lively academic discourse but governance activities are rare or non-existent, and (iii) countries in which both academic discussions and governance activities are very rare or non-existent. According to our analysis, the first group of countries comprises Denmark, Germany, the Netherlands, Norway, the United Kingdom and Switzerland, the second and third group comprises Croatia, France, Italy, Poland, Serbia, Slovenia, and Spain. In the following, our results concerning four European countries – Germany, France, Croatia and Poland – will be briefly summarised.

Since the first half of the 2000s, there have been a fairly wide range of activities on human enhancement issues in *Germany*. In the mid-2000s, the National Ethics Council worked on the topic of human enhancement which included the publication of a report on a public dialogue event organised by the council in Berlin in 2005.² Since the early 2000s, academic discourse has increased in importance and included a wide variety of topics such as the general trend in health care towards medicine that can fulfil individual wishes, 'gene doping', cosmetic surgery, and a wide variety of other means and aspects of human enhancement including aesthetic, cultural and historical ones. Arguably, the most significant instance of discourse on human enhancement in Germany is a vivid debate on pharmaceutical cognitive enhancement. This included the publication of a number of popular scientific books and various warnings about pharmacological cognitive enhancement, for example by the German Association for Psychiatry and Psychotherapy and the German Centre for Addiction Issues. Three presentations at the 2009 Annual Conference of the National Ethics Council (now: German Ethics Council, Deutscher Ethikrat), which was dedicated to technological interventions in the brain, dealt directly with the topic of neuro-enhancement. In the same year, an interdisciplinary group (composed of bioethicists, philosophers, law experts and natural scientists) whose work had been funded by the German Ministry of Education and Research published a memorandum in the German popular scientific magazine *Gehirn und Geist*.³ It gained broad coverage in the media and stimulated a very controversial debate. The authors argued for the liberalisation of neuro-enhancers – provided that they are safe enough –, for an appropriate regulation to counteract undesirable social consequences and for an open public debate on this topic. Since the early 2000s, a number of projects and studies by the Office of Technology Assessment at the German Parliament (*TAB*), which is run by our institute ITAS, have also been dealing with the topic of human enhancement.⁴ This included projects and studies

on nanotechnology, neuro-science, and 'converging technologies' (nano, bio, info, cogno; NBIC). In 2009, TAB completed a study on gene doping, defined as the nontherapeutic use of cells, genes, genetic elements, or the modulation of gene expression having the capacity to improve athletic performance. The study concluded that gene therapy-based methods (i.e. gene doping in the narrow sense) probably pose far greater obstacles to misuse than the many different techniques and pharmaceutical developments used for the specific manipulation of gene activity. In a recent TAB study on pharmacological enhancement, it was emphasised, *inter alia*, (i) that the situation is characterised by scarce empirical evidence of the efficacy of any such drugs and by a lack of empirical studies on healthy subjects, and (ii) that the few studies in which cognition-enhancing effects on healthy volunteers were reported, the experiments were done when these volunteers were sleep-deprived or under environmental or operational stress. The German Federal Ministry of Education and Research continuously funds projects on ethical, legal and societal aspects (ELSA) of the modern life science and biotechnology. Since 2008, several ELSA projects on the human enhancement thematic were funded, as well as other ELSA projects which included the topic. Furthermore, projects for the promotion of junior researchers were funded within the ELSA programme. This included interdisciplinary summer schools on such issues as aesthetic surgery, deep brain stimulation, individualised medicine, cognitive enhancement, the precautionary principle in nano-bio-technology, and anthropological, sociological and philosophical aspects of human enhancement. Earlier, the Ministry of Education and Research had funded a number of projects on pharmaceutical cognitive enhancement (one of the results being the above-mentioned memorandum), a project on genetic enhancement in sport, and several other projects which dealt with the topic of enhancement in broader contexts, including several public dialogue activities which largely focused on young people. Since the first half of the 2000s, the Ministry had also funded technology assessment, foresight and similar activities which dealt with the topic of enhancement in broader contexts. German research institutions are also often involved in European and international academic and policy advice activities on human enhancement. Political institutions for the promotion of culture and science have also started to work on the topic, both at national level and at the level of the German states. The Saxonian Academy of Sciences has, for example, worked on the topic for several years now and organised a conference on human enhancement in February 2012. At a conference in Karlsruhe in October 2010 which was open to the public and dealt with ethical and societal aspects of human enhancement (entitled: 'Ever better, ever more beautiful? Human beings as the object of technological optimisation in a performance-oriented society'), one of the keynote speeches was given by Andreas Voßkuhle, president of the German Federal Constitutional Court. Referring to such practices as starvation diets, cosmetic surgery and artificial means of building up muscles, Voßkuhle stressed the high value of individual freedom, but warned against mandatory enhancements, for example if a child is coerced by ambitious parents into undergoing cosmetic surgery. The

Evangelical Church in Germany, political parties, and a number of research institutions have also been involved in, or have organised, workshops, seminars, and public dialogue activities dedicated to human enhancement issues, partly in the context of discourse on nanotechnology and 'converging technologies'. Academic and public discourse are both characterised by a broad spectrum of positions and approaches, and they fairly often include cultural and historical aspects of the topic, including Germany's Nazi past.

In *France*, academic discourse on human enhancement is well advanced but governance activities are apparently almost non-existent so far. French discourse on the visionary aspects of nanotechnology and 'converging technologies', which is influential in European and international contexts, has been dealing with issues of human enhancement since the early 2000s. In November 2004, the High Council of the Mines and the High Council of Information Technology – merged in 2009 to become the High Council for Industry, Energy and Technology – published a report by Jean-Pierre Dupuy and Françoise Roure on ethical aspects and industrial perspectives of nanotechnology.⁵ The report discussed human enhancement quite extensively, criticising the so-called 'NBIC initiative' on 'converging technologies' in the U.S. which has played a key role in creating the new human enhancement discourse in the 2000s and popularised radical ('transhumanist') pro-enhancement positions in ethico-political discourse on human enhancement.⁶ Civil society organisations and facilitators of public dialogue on science and technology such as the organisation VivAgora discussed human enhancement issues in connection with the topic of NBIC convergence since the mid-2000s. Radical protesters against nanotechnology, who are strong in the Grenoble region, have also warned against the perils of what they see as corporate and military endeavours to promote and develop human enhancement technologies. There is also a wide range of academic publications on human enhancement issues in France. These include philosophical, cultural and political aspects of more far-reaching and visionary perspectives such as the issue of a posthuman future. Novels by Michel Houellebecq have brought the enhancement thematic to the attention of a broader public, and a number of academic conferences have been specifically devoted to human enhancement.

In *Croatia*, bioethical aspects of eugenics, including so-called 'liberal eugenics' (and thereby discourse on human enhancement in the 2000s) as well as far-reaching visions of the future, have been debated in scholarly journals. The same holds true for the topic of enhancement and sport and for visionary ideas about a posthuman future and cyborgisation. This has been combined with empirical studies on the views of Croatian students on such visionary ideas and their interrelations with religious beliefs. Furthermore, a fairly large number of younger scholars have published articles on enhancement issues in Croatian low-profile scientific journals. Apparently, these articles also comprise a broad variety of positions on human enhancement issues.

In *Poland*, a number of scholars have published scholarly articles or given presentations on the topic of genetic enhancement in recent years, including the broader aspects of human enhancement. We have not found any publications by Polish scholars that argue in favour of human enhancement, and the publications we found are either very or modestly critical of it. Some publications are in line with, and inspired by the critique of 'liberal eugenics' by the eminent German scholar Jürgen Habermas. Other publications are by scholars who work at Catholic universities and are members of Catholic religious institutes or congregations. In line with Catholic theological discourse on the topic, they argue against enhancement as a new form of eugenics. One of them, Barbary Chyrowicz (member of the congregation of the Holy Spirit Missionary Sisters), took part and gave a presentation on 'Selective Eugenics and Enhancement Eugenics' at a conference at the Vatican which was sponsored by the Pontifical Academy for Life on the theme 'New Frontiers of Genetics and the Danger of Eugenics' and took place in February 2009.

If we look at publications by policy advisory institutions in Europe in which recommendations were made, it is interesting to note that these recommendations are often presented in the form of alternative routes of action tied to specific ethico-political approaches or stances. This fact can be interpreted as a further sign of the cultural diversity in Europe with regard to human enhancement issues. This diversity is not restricted to differences between national cultures but encompasses cultural differences within countries. It also indicates that practices and visions of human enhancement are raising challenges related to unresolved questions in Europe's common cultural history that are also related to religious aspects. Apparently, discourse on human enhancement is, for example, less developed in countries which are strongly influenced by Catholicism.

Following the publication of our study on behalf of the European Parliament, human enhancement was the topic of a written question by a Member of the European Parliament to which the EU Health Commissioner replied. In August 2009, a new STOA project entitled 'Making Perfect Life' started. Recently completed, it also looked at human enhancement issues. The European Commission has funded more than a dozen research projects dealing with ethical, legal and societal aspects of the topic since the mid-2000s, some of which even focused on the topic. Moreover, there are several new or forthcoming projects funded by the European Commission which cover the topic of enhancement, and the European Parliament has mentioned it again in one of its resolutions on nanotechnology. The explicit funding of non-therapeutic human enhancement research and development projects is very rare in Europe however. The only noteworthy examples are to be found in certain funding programmes of the EU, such as the funding field 'Future and Emerging Technologies' (*FET*). In 2011, the EU has published a call for proposals which promotes HET under the label 'Engineering of the Brain and Body'. This is not a funding scheme for research and development, however, but for innovation-oriented stakeholder and public

discourse. Several publications and activities of the European Group on Ethics in Science and New Technologies (EGE), which gives advice to the European Commission, have dealt with human enhancement issues. Dutch public funding agencies have prominently included the topic in their ambitious science and society research programme. Interestingly, this includes projects which focus on military applications which are usually a taboo issue in the EU. Official documents and statements by important representatives of the political system, however, are rare. Some official EU documents and statements concerning the governance of nanotechnology have dealt with the topic on various occasions, and at times have recommended that certain types of research and development not be funded. A UK parliamentary committee worked for two years on the use of enhancement technologies in sports and published a report on this activity. Two German parliamentary committees dealt to some extent with the issue in the context of the above-mentioned TAB study on gene doping. In 2009, the German government also funded a very high-profile public science communication activity – a national exhibition – in which very far-reaching, ‘transhumanist’ visions of human enhancement played an important role.

Seen overall, however, European policy makers have not developed substantial activities on the topic, let alone adopted a political stance. In the official document and statements, human enhancement is clearly seen as negative more often than not, though this might also be explained by the fact that a large part of these activities dealt with controversial or illegal aspects of human enhancement such as doping in sports. In our interactions with parliamentarians and other policy makers, we have noticed that general political stances and beliefs appear to determine the position a politician has on human enhancement. Unsurprisingly, social conservatives tend to have negative views of HET, while liberals (in the European sense of the term which includes economic liberalism) argue for non-restrictive approaches. Politicians of the left and centre-left often tend to be critical too.

4.2. Human Enhancement Discourse and Christian Religion

Christian authors have contributed to visionary discourse on human enhancement, often at a very early stage (e.g. in the debate in the 1990s on Frank Tipler’s visions of the far future), and to its critique (e.g. by characterising transhumanism and other radical pro-enhancement worldviews as pseudo-eschatological).⁷ Discourse on human enhancement or HET themselves are often seen as challenges to Christian anthropology and eschatology. Core themes of lay Christian and theological discourse are the *Imago Dei*, immortality and resurrection, the mind-body dualism, the legacy of Gnosticism, and the role of humans and of technology in creation and eschatology, as can be seen, for example, in contributions by Pope Benedict XVI, Bishop Wolfgang Huber of the Evangelical Church in Germany, Wolfhart Pannenberg, Elaine Graham, and Ted Peters. Christian and other religious voices are often seen, particularly in the U.S., as antipodes to transhumanists and other promoters of radical

HET. Far-reaching future perspectives and the so-called 'second-stage enhancements' (see below) raise challenges to our views of society and what it means to be human. In transhumanist and other radical pro-enhancement visions, science and technology appear to play the role of an *Ersatzreligion*.

In our study on behalf of the European Parliament, we have argued that religion is an important aspect in the debate on human enhancement for several reasons: Firstly, the more far-reaching visions of transhumanists and other ardent promoters of human enhancement appear to be quasi-religious, or even as possible elements of a new technoscientistic religion or cult. Secondly, and probably also for this reason, theologians and Christian laypeople have been engaged at rather early stages and to a strong degree in discussions about human enhancement. Thirdly, to many Christians some second-stage enhancements appear as offensive as certain older biotechnologies. Fourthly, mainly in the U.S. but with growing impetus in Europe, there is a debate on Darwinism, biological evolutionary theories, and the competing Christian fundamentalist, 'creationist' worldviews. Fifthly, we have witnessed in large parts of the world a growing interest in religions which also has an impact on the debate on human enhancement as a matter of course. Sixthly, the churches and other religious organisations play an important role in health systems. In our study, we also questioned the assumptions that certain non-Western or non-Christian cultural traditions are much more conducive to the spread of HET than Christian occidental ones, and that Asian religions which do without a notion of limits set by a God, or a secularised highest entity, give a *carte blanche* for all kinds of radical modifications of human beings.

We must also bear in mind that Christian views on human enhancement are far from consistent. There are, for example, several U.S. and some European theologians whose views are quite open to a perspective of human enhancement. Within Christian theology, the notion of humanity as God's 'co-creator' is particularly relevant here. In a particular strand of Protestant theology, this concept is related to the notion that Christians cannot accept the *status quo* as normative, but have to press on creatively toward a new and better future. For some of these co-creationist theologians, this includes far-reaching uses of genetic engineering, or even an open stance towards transhumanism, a fact that is appreciated by some transhumanist leaders. Accordingly, the Vatican, which favours a rather restrictive approach to certain technological developments, warned in a high-level document already in 2002 that the idea of humans as co-creators with God could be used to try to justify the management of human evolution by means of genetic human enhancement, defined in this document as genetic engineering which aims at improving certain specific characteristics.⁸ Bishop Wolfgang Huber, former Chairman of the Council of the Evangelical Church in Germany, sees two main tendencies which call into question the notion of a person as a free and responsible being, created in the image of God: (1) prenatal negative eugenics and (2) the transhumanist visions of a technological

immortality and of creating a new species by means of artificial intelligence or genetics; this would, in his view, amount to annihilating the exceptional position of mankind.⁹ Pope Benedict XVI devoted his second encyclical (*Spe Salvi*) to the issues of Christian hope and of secular hopes for the future (see below).

New, cutting-edge visionary and even merely fantastic technologies are at the core of a discourse on human enhancement in which age-old themes, dreams and fears abound. It is not accidental that the transhumanist movement has attracted so much attention in this context, and the potential attractiveness of their ideas should not be neglected. The visionary core of transhumanist ideology was aptly summarised in the first article of a manifesto that dates from the early 2000s and reads as follows: “Humanity will be radically changed by technology in the future. We foresee the feasibility of redesigning the human condition, including such parameters as the inevitability of aging, limitations on human and artificial intellects, unchosen psychology, suffering, and our confinement to the planet earth.”¹⁰ Neither transhumanism in general nor the specific ideas on human enhancement are new or original however, not even with regard to most of the technological visions. What we have to deal with here is a well-established, albeit (in post-utopian times) often overlooked main strand of Western (and Russian for that matter) history of ideas whose visions of the future have only been changed by being technologically modernised and partly adapted to a more individualistic and anti-totalitarian *Zeitgeist*.¹¹ This ideology of extreme progress culminates in visions of a post-human civilisation in outer space, advancing the notion of the necessity of radical transformations of human biology. It has triggered, also since the first half of the twentieth century, strong reactions by religious and secular conservatives and also by left-wing critics of scientism.

Starting in the 1870s with the author and African explorer Winwood Reade, who had fairly close contact with Charles Darwin, a number of mainly British but also some Russian or Soviet authors developed the ideology of extreme progress which aims at the progressive overcoming of all the limits mentioned in the transhumanist declaration. Reade’s vision has influenced, in one way or the other, a wide range of people, including H.G. (Herbert George) Wells, Winston Churchill and George Orwell. Wells in particular defined posthumanism – the question of what comes after humankind – as a great challenge for our species. In his ambiguous visions of the future, HET was sometimes imagined to be a means of creating a better, more rational and peaceful future. Some of those who followed him, such as the eminent scientist John Desmond Bernal – who had a crucial influence on the science fiction genre – have reduced the ambiguity to a mere flirt or coquetry with the uncanny, and have in fact created the coherent worldview which now is most often known as ‘transhumanism’. Speculative essays about the future of mankind had an important influence on the development of the extreme progress ideology. Among the more prominent examples are *The Discovery of the Future*, written by Wells at the beginning of the twentieth century, J.B.S. (John Burdon Sanderson) Haldane’s *Daedalus, or Science and*

the Future, written in 1923, and Bernal's *The World, the Flesh, and the Devil. An Inquiry into the Future of the Three Enemies of the Rational Soul*, published in 1929. Although these essays had their playful aspects, they were meant as serious predictions of the future. Nevertheless, they were closely related to the new genre of scientific romance, a forerunner of modern science fiction whose most important representatives were Olaf Stapledon and, once again, Wells. Both played crucial roles in the development of the ideology of extreme progress. The hope underlying this ideology was for infinite progress of humanity or its offspring. In the words of Haldane: "There is no theoretical limit to man's material progress but the subjection to complete conscious control of every atom and every quantum of radiation in the universe. There is, perhaps, no limit at all to his intellectual and spiritual progress".¹² These essays had an astounding impact on cultural discourse on science and technology. Wells, Haldane and Bernal forcefully established a new, post-Darwinian Baconianism in this discourse, devoid of Christian framings, focused on the application of science, oriented towards a far-future in outer space, and quasi-eschatological. A major literary reaction to this new atheist and futurist Baconianism was the development of the classical dystopian thought of the twentieth century. Haldane's influence on *Brave New World* is well-known, as is the fact that this still highly influential novel, written in the year 1931, was originally intended as a direct attack against Wellsian utopianism. In a certain sense, the authors of the classical dystopias of the twentieth century such as Charlotte Franken (in *Man's World*, 1926), Yewgeny Zhamyatin and George Orwell (in *The Road to Wigan Pier*, 1937) primarily reacted to the development of this ideology. Since these dystopias – *Brave New World* in particular – are still highly relevant for public and professional ethical discourses on human enhancement, the sociotechnical imaginaries of Wells, Haldane und Bernal are still with us. The same holds true for popular Christian reactions to this ideology, namely fictional works by C.S. (Clive Staples) Lewis and his friend J.R.R. (John Ronald Reuel) Tolkien. Lewis directly polemicised against Haldane and other ideologues of extreme progress and even wrote an essay on *The Abolition of Man*, published in 1943, which is still influential among religious and cultural conservatives, including prominent bioethicists such as Leon Kass. The science fiction of Lewis also directly confronts the ideology of extreme progress, including *ad hominem* attacks. Except in some of his letters, Tolkien did not directly polemicise against this ideology, but his immensely popular trilogy *The Lord of the Rings* can in many aspects be read as a critique of the visions of Wells, Haldane, Stapledon and Bernal. The classical dystopian tradition and influential Christian conservative critiques of technoscientific progress are thus deeply indebted to the imagination of the ideologues of extreme progress – and both traditions are still shaping cultural discourse on science and technology today.

This worldview enjoys manifold and close relations with the development of science and technology in the 20th and 21st centuries. While Reade's vision of a colonisation of outer space by virtuous humans, endowed with new, technoscientifically produced

bodies, lacked scientific imagination, Wells, Haldane, Julian Huxley and, in particular, Bernal developed in their essays in the first third of the twentieth century many of those visions of HET which still shape the current debates. Worthy of mention here are (i) neuroelectric visions of cyborgs, which at the time obviously had to be imagined without reference to computer technology, (ii) ectogenesis, (iii) perfect control of emotions, (iv) significant life extension, (v) immortality of individual minds in a human-machine-symbiotic superstructure resembling an organism, (vi) the conquest of outer space, and (vii) saturation of the universe with earth-based intelligence. Arguably, all the major concepts and core elements of the current transhumanist movement's ideology, with the exception of some far-reaching visions of artificial intelligence, computer technology and, possibly, nanotechnology, can thus be found in works of these authors; even the notion of transhumanism was coined by one of them, namely by Julian Huxley in the 1950s. Due to its extraterrestrial orientation, this visionary world view conceives human beings only as forerunners of future posthumans which, to be able to live in outer space, must necessarily be 'mechanical' humans. Science fiction and the visionary discourse on space research are among the most important vehicles that have helped to maintain this ideology of extreme progress in the decades after World War Two.

From such a historical point of view it becomes obvious that this ideology must be seen as a technological and indeed often technocratic eschatology. What might be interpreted as a, to some degree, specifically British reaction to the crises in the first third of the twentieth century, related to the Darwinian challenge to traditional world views, has thus become an important element of our Western discourse on science, technology and the future. These historical perspectives are essential if one is to understand the features of the new discourse on human enhancement, as they reveal that the current social and political shaping of new and emerging technologies often relies on visions that were developed in a highly specific historical context and might not be appropriate for our times. The visions are rooted in a historical situation in Britain which was marked by a conflict between the defenders of Christianity, traditional society and its values on the one hand and socialist or technocratic, post-Darwinian progressives such as Bernal and Wells on the other.

In general, current ideologues of extreme progress focus less on rather well-established nutritional, surgical, pharmaceutical and other traditional medical enhancements and more on enhancements that are based on or appear to emerge from advances in brain research, new neuro- and biotechnologies, nanoscience and artificial intelligence research. It is this latter group of emerging or visionary HET that George Khushf referred to as 'second-stage enhancements'.¹³ According to him, the new tendencies in human enhancement are conceptualised as (a) 'self-aware evolution' (direct engineering of the next stages of the processes guiding the development of life through the genetic alteration of existing living systems or the direct creation of artificial life), (b) 'human-machine hybrids' or 'humanity

2.0' (in keeping with the trend towards developing technologies that make humans stronger, faster and more agile, using increasingly seamless human-machine interfaces and directly incorporating ever smarter technologies in the form of implanted chips, neural interfaces or simply remote sensing capacities), and (c) 'medical enhancements' (refining medical tools, enabling and enhancing normal human function and making possible radically new functions, introducing capacities that humans have never had before). To this list could be added drugs which, though still largely visionary, are designed to alter basic human traits (such as empathy or aggressiveness) or fundamental features of an individual's psychological identity (such as drugs for memory erasure). It is such second-stage enhancements that one has to focus on when analysing the ideology of extreme progress and its visions of human enhancement: only second-stage enhancements would have the potential to radically change the human condition and potentially justify the characterisation of the underlying visions as a kind of techno-eschatology.

Unfortunately, transhumanist and other adherents to the ideology of extreme progress, as well as some of their critics, present their ideology as the logical outcome or even the culmination of the strivings of social utopians, classical humanists, Enlightenment thinkers, and the progressives of technoscientific modernity. However, the transhumanist ideology with its peculiar notions of progress and a biological and technological betterment of humanity is in deviation from the mainstream of social utopianism and of modern progressivism. Several authors, many of them conservative, nevertheless affirm the self-perception of the current ideologues of extreme progress as the legitimate heirs of the age of Enlightenment and of modernity at large. The Enlightenment is reduced to its high esteem for science and technology, and the Age of Reason is portrayed as an era of technophilia and of shallow notions of progress. If they refer to any Enlightenment thinkers at all, these critics often use Condorcet and Julien Offray de La Mettrie as straw-men.

Pope Benedict XVI, whose intellectual development as an eminent German theologian took place in the reform-oriented 1950s and 1960s and who was confronted with the radical movements of the late 1960s, devoted his second encyclical (*Spe Salvi*, 30 November 2007) to the issues of Christian hope and secular hopes for the future.¹⁴ In it he discusses the nature of the Christian hope for eternal life (*Spe Salvi*, 10-12) and raises the question of whether we really want to live for all eternity. In his view, to live for ever, without end, can only be monotonous and ultimately unbearable, and "to eliminate death or to postpone it more or less indefinitely would place the earth and humanity in an impossible situation", and "even for the individual would bring no benefit." We can only attempt to imagine ourselves outside the temporality that imprisons us and in some way sense that eternity is not an unending succession of days in the calendar, but rather the supreme moment of satisfaction. Obviously, such an understanding of Christian hope is at odds with the visions of extreme progress which include cybernetic immortality

and an endlessly prolonged biological existence. In Benedict's narrative, Francis Bacon's programmatic vision determined the trajectory of modern times to the extent that hope acquired a new form: faith in progress (*Fortschrittsglauben*). According to the Pope, two categories became increasingly central to the ideology of progress as it developed further: reason and freedom (*Spe Salvi*, 18). In his view, the dominion of reason and freedom were seen purely as promises in which a human being becomes more and more fully himself. The Pope identifies two essential stages in the political realisation of this hope, the French Revolution and the Marxist revolutions (*Spe Salvi*, 19-22). Against this historical background, Benedict argues that a self-critique of modernity is needed in dialogue with Christianity and its concept of hope. He refers to Theodor W. Adorno's notion of progress from the sling to the atom bomb. In Benedict's view, if technological progress is not matched by corresponding progress in man's ethical formation and inner growth, then it is not progress at all, but a threat to humankind and to the world. Humans could never be redeemed simply from outside. Bacon and those who followed in the intellectual current of modernity that he inspired were therefore wrong to believe that humans would be redeemed through science. Benedict emphasises that it is not science that redeems man, but love (*Spe Salvi*, 26). The Pope argues that protest against God is understandable in the face of the world's suffering, but that the claim that humanity can and must do what no god actually does or is able to do is both presumptuous and intrinsically false. In his view, this idea has led to the greatest forms of cruelty and violations of justice; he claims that a world which has to create its own justice is a world without hope. No-one and nothing could guarantee that the cynicism of power will cease to dominate the world. Benedict again refers to Adorno here, arguing that the latter was equally critical of atheism and theism, and reminding us of the Frankfurt School's extreme radicalisation of the Old Testament ban on images. Commenting on Adorno's view that true justice would require not only a world in which present suffering would be wiped out, but also one in which that which is irrevocably past would be undone; the Pope writes that this would mean that there can be no justice without resurrection of the dead. Benedict acknowledges that, in Adorno, this would have to involve the resurrection of the flesh and that the philosopher characterised this as being totally foreign to idealism. Interestingly, however, he leaves out Adorno's argument that Marxist (also known as 'materialist') imagelessness converges with the theological ban on images, and that materialism agrees with theology where the former is at its most materialistic¹⁵: The longing for the resurrection of the flesh is shared by Christian religion and materialism as Adorno understood it. In his view, the Christian concept of the resurrection of the flesh was more 'enlightened' than speculative metaphysics. In Adorno, hope means bodily resurrection and its spiritualisation destroys what is best in this hope. Faced with absolute mortality, whoever believes in God cannot believe in Him, and the possibility for which the divine name stands is adhered to by those who do not believe. The Pope, however, emphasises that for the believer the rejection of images cannot be taken so far that one ends up saying 'no' to both theism and atheism,

and that the protest against God in the name of justice is not helpful.

If it had not been authored by such an eminent and senior German scholar, one might have dismissed this treatment of Adorno's views on progress as a venial misinterpretation, influenced by a widespread but one-sided reception of Adorno's ideas on progress, science and technology. Yet the Pope – being, after all, Joseph Ratzinger – certainly knows that Adorno had characterised the notion of *Fortschrittsglauben* (i.e. faith or belief in progress) as an invective of those 'who from time immemorial' want the same thing, namely "that there be no progress".¹⁶ He will most probably also remember the remarkable conference in Germany in 1962 at which the notion of 'progress from the slingshot to the megaton bomb' was already put forward by Adorno.¹⁷ In fact, large parts of his lecture at this conference amounted to a criticism of anti-progressive thinking *à la* Martin Heidegger which holds that humans, in the name of their finitude and mortality, have to wholeheartedly appropriate both of these qualities. Adorno wrote: "A sober response to this false reverence would be that while indeed progress from the slingshot to the megaton bomb may well amount to satanic laughter, in the age of the bomb a condition can be envisaged for the first time in which violence must vanish altogether".¹⁸ While a theory of progress in Adorno's view "must absorb whatever is cogent in the invectives against belief in progress as an antidote to the mythology from which such a theory suffers", it should also recognise that, "despite Condorcet", the idea of progress only became a shallow ideology after the bourgeoisie had occupied the decisive power positions. Again and again, Adorno reminded us of instances of true progress. Citing the sinking of the *Titanic* and the success of subsequent safety measures as an example, he argued that part of the 'dialectic of progress' is that historical setbacks, which themselves are instigated by the principle of progress, also provide the condition needed for humanity to find the means to avert them in the future. In Adorno's view, "(t)he progress of the domination of nature, which, in Benjamin's simile, proceeds in the reverse direction of that true progress which would have his *telos* in redemption, nevertheless is not entirely without hope. Both concepts of progress communicate with each other, not only in averting the ultimate catastrophe, but rather in every actual form of easing the persistent suffering."¹⁹

The Pope could have explored the potential for a dialogue between secular hopes for a better world (or even redemption) and Christian hope. Instead, he abetted the mental association of any such hopes with the terror of the French Revolution and Bolshevism which is as unfair as linking Christian hope to the terror of the inquisition, of *falangismo* or of the *ustasha*. Moreover, Benedict could have critically asked how a resurrection of the flesh is conceivable in a non-Christian and non-metaphysical framework without resorting to radical visions of human enhancement. He might still have come to the conclusion that there is necessarily a hierarchy of hopes, with the Christian hope at the top, and that all secular hopes for redemption are dangerous. But he would have been in a position to

judge on the basis of a serious engagement with the ideas of the philosophers to whom he referred. To sum up, the Pope, rather than using the invective *Fortschrittsglauben*, could have engaged more seriously with mature notions of progress and secular hopes for the future which are in some respects very similar to, albeit not identical with the Christian hope. He chose not to do so, for reasons we do not know.

We may keep hold of the fact, however, that there are still today prominent instances of a Christian critique of the ideology of extreme progress which remain faithful to a traditional, polemically anti-modern worldview against which Reade, Wells, Haldane and Bernal argued and fought. In a certain sense, the ideology of extreme progress, including the radical visions of human enhancement, can be deemed an aggressive defence of the modern idea of progress against the similarly aggressive attempts of Christian and other conservatives to delegitimise this very idea.

There are several pieces of evidence as well as good reasons for making an educated guess that the debate on religious aspects of human enhancement, that is already rather vivid, will most probably continue to gain impetus. The anti-permissive, anti-relativist, and anti-hedonistic line of reasoning, for example, which is characteristic of conservative Christians, ranging from Pope Benedict to U.S. evangelicals, already plays an important role in the debate on human enhancement. Obviously, at the heart of the type of critique advanced by many religious cultural conservatives is an anti-permissive and anti-hedonistic line of reasoning. In this view, our societies are in need of clear normative boundaries, and we should live our lives according to traditional values, appreciating our limits, including our mortality, as well as looking for happiness, instead of mere fun and a shallow form of freedom.²⁰ This appears to them less as a danger of political abuse of HET, but of horrible effects caused by the total sum of individual decisions taken without a solid moral ground. Leon Kass, for example, sees our societies on a slippery slope to a Brave New World. He writes: "Just give us the technological imperative, liberal democratic society, compassionate humanitarianism, moral pluralism, and free markets, and we can take ourselves to Brave New World all by ourselves."²¹ In his view, only a moral and religious awakening may save us. There are also already quite a few instances of Christian theologians and lay activists who have engaged in the new debate on human enhancement with a focus on its wider cultural, ideological, and political aspects. Some of these authors see several visions of human enhancement as an important manifestation of modern *hubris*, and as an attempt to play God by violating laws of a given natural order of society and human existence. Christian lay activists and authors, in particular, often offer a reduced version of a thesis that states that secular modernity is a morally disastrous aberration from the natural order, and its danger lies above all in its Utopian elements and some of the consequences of technoscientific progress. They often interpret this aberration as a kind of heresy with roots in a magical or Gnostic, but in any case decidedly anti-Christian revival in the times of the Renaissance. Moreover, they often explicitly characterise transhumanism as a

rival to Christianity, promising what is, in their view, already available to Christians (such as eternal life). The assumption of a religious confrontation is affirmed by some leading transhumanists.²² However, several other leading figures of transhumanism concede or even emphasise similarities between their visions and religious ideas, and some ponder how to strengthen existing syntheses of transhumanism and religious thought or develop new ones.

The ideology of extreme progress was developed in the late 19th and early 20th centuries as a means of further weakening the existing social order and its religious values. While this original function has not entirely disappeared, the visions are now rarely combined with a radical critique of society. With very few exceptions, the ideologues refrain from any vision of a final culmination of progress, retaining instead a modern notion of infinite progress. They systematically weaken the rationality of the modern idea of progress however, particularly when the far-reaching visions of human enhancement and post-humanity take centre stage in their discourse. The ideology thus offers a specific answer to a structural problem of modernity, namely the overstraining of progressive rationality by eschatological hopes²³, and is at the same time a symptom of this overstraining.

Attempts to ignore or ridicule the transhumanists as an insignificant techno-cult (which were rather widespread in the 1990s and at the beginning of the present decade) have turned out to be futile endeavours. Although many of the transhumanist visions have a smack of science fiction (of the unrealistic, 'space opera' kind), they have managed to gain considerable ground in the ethico-political debate on human enhancement as well as rather widespread attention in diverse academic fields and in the media. It would, however, be highly misleading to pose the transhumanist movement as a stakeholder in the debate on new technologies that is on a par or on eye-level with such stakeholders as the churches. While it is true that transhumanists and conservative bioethicists have together long dominated the debate on human enhancement from the extremes, the influence of transhumanist ideas far exceeds the movement's social relevance and its political power. The transhumanist movement can be deemed the spearhead, or at least the most vocal and activist element, of a broader social current which is characterised by its promotion of an ideology of extreme progress.

Highly visionary discourse on human enhancement and (to a lesser degree) the related discourses, such as those on nanotechnology and 'converging technologies,' suffer from an ideological imbalance²⁴: at one end of the spectrum of opinions, the one which is marked by radical criticisms of technology and progress, a barrier is usually erected against unscientific beliefs and fundamentalist currents of thought. At the other end of the spectrum, however, the one which is characterised by far-reaching visions of technoscientific progress, the limits to salvation ideologies and mythical thought are permeable.

Acknowledgements

Sections 1 and 3 of this chapter are largely based on or were taken from a study which was conducted on behalf of the European Parliament and co-authored by Leonhard Hennen, Pim Klaassen, Michael Rader, Martijntje Smits, Mirjam Schuijff and Gregor Wolbring (http://www.europarl.europa.eu/RegData/etudes/etudes/join/2009/417483/IPOL-JOIN_ET%282009%29417483_EN.pdf). The study was carried out by the European Technology Assessment Group (ETAG) for the STOA (Science and Technology Options Assessment) panel of the European Parliament and was commissioned under specific contracts IP/A/STOA/FWC/2005-28/SC35, 41 & 45 and completed in May 2009. It was carried out by the Institute for Technology Assessment and Systems Analysis (ITAS) within Karlsruhe Institute of Technology (KIT) and the Rathenau-Instituut, Den Haag, Netherlands. The chapter was also written with the support of the European Commission FP7 Science in Society funded project, 'Ethics in Public Policy Making: The Case of Human Enhancement (EPOCH),' grant number SIS-CT-2010-266660 (<http://epochproject.com>). I would like to warmly thank the above-mentioned co-authors of the STOA study and my colleagues who worked with me on the ITAS tasks in the EPOCH project: Arianna Ferrari, Vera Borrmann, Sebastian Elsbach, Sally Forstmann, Christoph Kehl, Hannah Weinhardt and Silvia Woll.

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- ⁴ See, for example, TAB (Office of Technology Assessment at the German Parliament), *Konvergierende Technologien und Wissenschaften. Der Stand der Debatte und politischen Aktivitäten zu 'Converging Technologies'* (TAB Background Paper 16; author: Coenen, C.), Berlin: TAB, 2008; Gerlinger K., Petermann, T., Sauter, A., *Gene doping. Scientific basis – Gateways – Monitoring* (Technology Assessment studies series, no. 3), Berlin: TAB, 2009; Sauter A, Gerlinger K, *Pharmacological interventions to improve performance as a societal challenge* (TAB report no. 143), Berlin: TAB, 2011.
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Chapter 5

STAYING HUMAN IN THE 21ST CENTURY THINKING BEYOND HUMAN ENHANCEMENT TECHNOLOGIES INSIDE THE BODY

by Rinie van Est and Mirjam Schuijff

STAYING HUMAN IN THE 21ST CENTURY THINKING BEYOND HUMAN ENHANCEMENT TECHNOLOGIES INSIDE THE BODY

by **Rinie van Est and Mirjam Schuijff**

The debate on human enhancement has focused so far on invasive biomedical technologies that work inside the body. To fully address the question of what does it mean to be human in the 21st century, we should also pay attention to a broad range of technologies that work outside the body, but still impact the bodily, mental, and social performance of human beings, and also raise all kinds of ethical issues. We should include in the debate, therefore, all kinds of 'intimate technologies', that is, technologies inside us (like cochlear implants or DBS), close to us (like EEG neuromodulation), between us (like social media), technologies that have a lot of information about us (huge databases), and technologies like us (for example, robots and smart environments).

5.1. Introduction

At the dawn of this century, one of the world's most outstanding futurists, Alvin Toffler¹, stated publicly that the biggest question facing the 21st century can be stated in just a few words: What does it mean to be 'human'? Two years later, the workshop *Converging Technologies for Improving Human Performance* underlined the relevance of Toffler's insight.² The workshop signaled the convergence of four key technologies: nanotechnology, biotechnology, information technology, and cognitive science. They dubbed this the NBIC convergence and claimed that it would lead to a new renaissance in science and technology.³ The workshop was set up by the National Science Foundation (NSF) and the Department of Commerce (DOC). One of the main conclusions at the workshop was that this wave of new technological opportunities should not only focus on curing ill people, but also on improving the mental, physical, and social capacities of healthy people. Although confined to small academic and policy circles, the NSF/DOC workshop triggered a worldwide debate on *human enhancement*.⁴

Up till now there is no clear consensus on what 'human enhancement' exactly means.⁵ Defining human enhancement often starts from a medical perspective, but is contrasted with treating illnesses. Then 'human enhancement' refers to healthy individuals who use biomedical technologies for other goals than the treatment or prevention of diseases.⁶ Technologies that fit this line of reasoning are for example cosmetic surgery, drugs for

mood improvement or better focus, deep brain stimulation, gene therapy and gene doping, or even selecting the preferred traits of one's offspring using pre-implantation genetic diagnosis.⁷ The debate on human enhancement technologies so far has thus focused mostly on technologies that work inside the human body; they are invasive biomedical technologies and they raise many ethical questions. We believe, however, that the bias towards 'human enhancement technologies in us' is not sufficient to address the broader question raised by Toffler: What does it mean to be human in the 21st century?

To fully address that question, we should not only look at 'technologies in us', but at a broad range of technologies that work *outside* the body, and impact on the bodily, mental and social performance of human beings. One example is an exoskeleton giving soldiers superhuman strength. Another example is a persuasive technology to reduce aggression by using a bracelet that measures heart beat and skin conduction. Once it detects that the wearer is getting aggressive, the bracelet vibrates. From earlier training with video games, the wearer knows that he or she will get no reward for being in an aggressive state of mind. So, when the bracelet vibrates in real life situations, he or she will know that there is no reward and will try to avoid becoming aggressive here as well.⁸ Technologies working outside the body raise new types of ethical issues. For example, persuasive technologies using light may enhance the performance of someone, without his consent, or even without that person knowing he is being influenced. This raises questions of autonomy and consent: is it morally permissible to enhance people unknowingly, or subconsciously?

We have explored such an encompassing perspective in the project "Making *Perfect* Life: Bio-engineering in the 21st century".⁹ This project was carried out by the European Technology Assessment Group (ETAG) and commissioned by the Technology Assessment Office of the European Parliament, named STOA.¹⁰ The Making *Perfect* Life project had two main goals. First, to identify major *over-arching trends* that are visible in the development of four fields of 21st-century bio-engineering, and the societal and political challenges related to these trends. And, secondly, to discuss in more detail some *specific developments* which exemplify the major trends in the four fields of bio-engineering and highlight a range of more urgent questions for regulatory policies in these fields. To achieve these aims, the project took a trans-technological perspective by describing a broad range of developments in four fields of bio-engineering: the engineering of the body, the brain, intelligent artefacts (the field of artificial intelligence), and living artefacts (the field of synthetic biology).¹¹ In addition, four specific developments – one in each of these four fields – were analysed. These were human whole genome sequencing, market introduction of neuromodulation techniques, capturing of the psychological and physiological states of users by means of information technology, and finally the pursuit of standardization in synthetic biology.¹²

This contribution wants to position the current human enhancement debate, with its focus on technologies *in* the body, within the larger debate on bio-engineering technologies that needs to be addressed in order to deal in a more integral way with the question: what does it mean to be human? Section 5.2. explores that question in a concrete way by comparing two neuromodulation techniques. We will compare deep brain stimulation (a physically invasive technology) with EEG neurofeedback (a physically non-invasive technology). We will describe how these technologies change existing socio-technical practices and create new ones, and how this challenges current regulatory frameworks. We argue that both the invasive deep brain stimulation device and the non-invasive EEG neurofeedback device should be regarded as potential human enhancement technologies. Section 5.3. will describe how bio-engineering in the 21st century will make new types of interventions in living organisms possible. This includes the human body and the brain. Besides making the development of technologies in the body possible, bio-engineering will lead to new types of artefacts with the ability to interact with users and intervene in their behaviour. It is argued that bio-engineering is blurring boundaries between humans and technologies. This raises the question of where the human body begins and ends and where the discussion on human enhancement should begin and end. In the final section we will reflect on what this means for the human enhancement debate and how to address the question of what it means to be human in the 21st century in a more integral way.

5.2. Invasive Versus Non-Invasive Neuromodulation Techniques¹³

Neuromodulation implies altering neural activity in order to change someone's behaviour or cognition for medical or other purposes, such as enhancement. Neuromodulation can be achieved in various ways, but medication and devices are the most common ones. This section compares deep brain stimulation (an invasive or, more specifically, implantable neurodevice) with EEG neurofeedback (a non-invasive device). We will argue that not only human enhancement technologies in us are changing what it means to be human in the 21st century, but that human enhancement technologies *near* us are also causing changes. Firstly, we will look at the two neuromodulation technologies.

5.2.1. Deep Brain Stimulation

Deep brain stimulation (DBS) uses an implantable neurodevice and requires brain surgery to place one or two electrodes in a carefully selected brain area. These electrodes are connected to a battery, most often placed under the clavicle or in the abdomen, via leads. All three parts of the device are implanted. When the device is switched on, the targeted brain region is electrically stimulated. However, the electrodes have to be programmed to find the most optimal settings. This programming is done by a physician who has a

programming device. Sometimes, patients themselves have a remote control for their DBS as well, which they can use to switch the device on or off. It is not currently known how DBS exactly works. It alters the activity of the neurons in the targeted area – as well as elsewhere in the brain since different brain regions are interconnected. What is known is that DBS is not a cure but a treatment of *symptoms*. When it is switched off, the symptoms return.

DBS is mostly used to treat Parkinson's disease but it is also used for dystonia and essential tremor. Experimentally, patients are being treated with DBS for refractory epilepsy, obsessive compulsive disorder, depression as well as some other psychiatric disorders. Since treatment with DBS requires (brain) surgeries to implant the electrodes, leads, battery and to replace empty batteries, there are severe risks associated with the treatment, like bleeding and infection. DBS is therefore a last resort treatment. Even if the implantation and treatment are successful, the side-effects can be manifold and severe. They range from difficulty with speech to (slight or quite distinctive) personality changes. A side-effect may also be that care-givers, who are now less needed, can feel obsolete and have difficulty in adjusting to the new situation.

Enhancement purposes for DBS have also been suggested. They include push-button happiness and memory improvement. In an experimental treatment of an obsessive compulsive patient, the patient reported feeling happy and blissful even though her symptoms had not lessened at all. In a trial to combat obesity using DBS, a patient reported sudden ability to recall crystal clear memories. Both examples have obvious enhancement benefits, but other enhancement purposes might be possible as well. However, using DBS as an enhancement technology is still speculation as there are no known cases of DBS being used for human enhancement.

DBS as a treatment is an established medical practice. Bringing this neurodevice onto the market is regulated in Europe under the Active Implantable Medical Devices Directive (AIMDD).¹⁴ The AIMDD regulates whether or not a medical device that – like DBS or pacemakers for the heart – is implanted and uses a source of power other than the human body to perform a function in the body, is allowed on the European Market with the CE (*Conformité Européenne*) mark. Manufacturers can affix this CE mark to medical devices if they are in accordance with European regulations. The three European regulations which cover such medical devices¹⁵ all try to protect the safety of both the patient and the doctor handling the device, as well as harmonising the European Market. A more harmonised Market is favourable for trade. The regulation of DBS as a medical device used for treatment under the AIMDD seems to be both stable and adequate for DBS. Still questions can be raised about the circumstances (not specified in the AIMDD) where existing clinical data is relied upon and no new clinical evidence is required. This means that altered – or perhaps even a new line of – devices can be put on the European Market without further clinical evaluation.

DBS for enhancement purposes is a novel, and not (yet) existing socio-technical practice. Regulation under the AIMDD will not be adequate for this socio-technical practice. Namely, the AIMDD solely focuses on how devices for the treatment of diseases are placed on the market. There is no attention for enhancement uses of the same devices, which might require even stricter control as there will be less tolerance for risks and side-effects in enhancement than in medical uses. Using DBS as an enhancement technology also raises questions about whether it is morally permissible if expensive technologies can only be used by the rich or whether the use for enhancement purposes is morally acceptable at all.

5.2.2. EEG Neurofeedback

EEG neurofeedback uses electroencephalography (EEG) recordings to display someone's brain activity in real time. The subject can then use the information about his or her brain to learn how to adjust the activity to a desired level. To carry out an EEG, electrodes are placed on the head of the subject, using a paste for better conductivity ('wet electrodes'). The number of electrodes used is dependent on the reason for the EEG: for research purposes electrodes can cover virtually the whole head while training sessions in EEG neurofeedback might require as little as three electrodes. The electrodes are connected to a computer, which processes the recorded brain activity and presents the results for the research or neurofeedback (in different ways). EEG neurofeedback is not physically invasive, although the desired changes are on the level of brain activity. EEG neurofeedback is offered for, amongst other purposes, the treatment of ADHD (Attention Deficit Hyperactivity Disorder). EEG neurofeedback is not a quick fix. Prior to the training sessions, a quantitative EEG (or qEEG) is made. For this, approximately twenty electrodes are used, resulting in a map of activity in different brain areas. The information about abnormal brain activity this map provides is used to make a treatment protocol. In following training sessions, the in real time recorded brain activity is displayed in a visual or auditory format. This can for example be presented as two bars (one displaying the optimal activity, the other the recorded activity, and the goal is to have them identical), a game (if you can keep the airplane flying straight, then the activity is optimal) or music (optimal brain activity is needed to hear the song without disturbance). From this recorded activity, the person learns to alter his or her brain activity to an optimised level. This requires a number of training sessions. For example, ADHD treatment might require forty to fifty sessions whereas treatment of anxiety might only take fifteen sessions.

EEG neurofeedback is offered for a myriad of conditions, ranging from anxiety and insomnia to better golf performance. However, for most purposes there is no sound body of literature determining its efficacy ('does it work?') or efficiency ('how well does it work compared to other remedies?'). There is only a scientifically robust body of literature on the efficacy of EEG neurofeedback for the treatment of ADHD. Many other areas are being studied,

such as epilepsy, autism, anxiety and insomnia. Non-medical use of EEG neurofeedback (as well as other forms of bodily feedback) is offered commercially as well. This includes the improvement of athletic performance (specifically in golf and swimming), stimulation of artistic gifts, as well as enhancing cognitive performance. EEG neurofeedback is further used in gaming technology, where headsets record brain activity to play a game. These headsets use so-called 'dry electrodes,' which do not require the use of paste. However, EEG neurofeedback is not a treatment that is devoid of risks and side-effects. The risks include inducing epileptic seizures. Side-effects include headaches, tiredness or feelings of anxiety during or after a session.

There are already commercial clinics offering EEG neurofeedback as treatment or enhancement technology but mostly the technology is used as a treatment. The socio-technical practices where the same or similar technology is used for enhancement or gaming are less well developed. The use of EEG neurofeedback for gaming is only now emerging, but several gaming companies are interested in this novel addition. The use of EEG neurofeedback for enhancement purposes is a small practice right now; yet we believe both practices might grow. The different socio-technical practices where EEG neurofeedback is used also have different implications for the regulation of this technology.

Putting a device for EEG neurofeedback on the market is regulated in Europe under the Medical Devices Directive (MDD).¹⁶ EEG neurofeedback devices currently on the market are seen as Class IIa medical devices, which can be characterised as devices that carry medium risks and corresponding entry requirements for the European Market. But there are several challenges to this regulatory regime of EEG neurofeedback devices, though. One problem is that the MDD only applies to devices with a medical (e.g. treatment or diagnostic) purpose. Use for enhancement purposes or gaming is not regulated under this Directive. Furthermore, not all EEG neurofeedback devices on the market that are being used for treatment have a purpose specified for medical use. Some are intended for relaxation. The technology then has to be in accordance with much less strict regulations, namely those for other, non-medical electric appliances. It can be questioned whether these technologies are safe enough to be indeed used on patients.

5.2.3. Human Enhancement Technologies in- and outside the Brain

To summarize, DBS works inside the brain and can be used for human enhancement purposes, to feel happier or improve memory. EEG neurofeedback is a non-invasive technology, which provides users real-time insight in their neural activity and thereby enables the user to alter his neural activity. In this way, using EEG neurofeedback can lead to better focus and better performance in certain tasks. It can thus be seen as a human enhancement technology that is situated outside the body, but with a clear impact

inside the body. This illustrates that human enhancement issues are raised not only by technologies inside the body, but also by technologies outside the body that have an impact on the performance of the human body or brain. We will aim to strengthen and broaden this argument in the final section. First, we want to describe the increasing interaction between biology and technology and how bio-engineering is currently blurring the boundaries between the human body and brain and technology.

5.3. Bio-Engineering in the 21st Century¹⁷

Driven by NBIC convergence, the scientific ambition of understanding the living world has become connected with the engineering ambition of *intervening in living organisms* as well as constructing *lifelike artefacts*. This is because NBIC convergence in essence implies the increasing interaction between the biological and physical sciences. This new engineering approach to life reveals two bio-engineering megatrends: 'Biology becoming technology' and 'technology becoming biology'.¹⁸ 'Biology becoming technology' expresses the idea that scientists and engineers increasingly look at living organisms in mechanical terms. It concerns the way in which physical sciences such as nanotechnology and information technology forward progress in the life sciences. Next, it refers to new engineering tools which allow more far-reaching interventions in living organisms, including the human body and brain. Evidently, the set of tools that potentially improve the performance of the human body or brain are the technological drivers behind the upcoming human enhancement debate. 'Technology becoming biology' is driven by the convergence in the opposite direction, whereby insights into biological and cognitive processes in the life sciences inspire and enable progress within the physical sciences. This second trend entails the idea that engineers are increasingly introducing lifelike features such as self-assembly, cognition and learning into technology.

5.3.1. Interventions in Living Organisms

Today, there are various biologically derived 'biotech' tools available or being developed which will make possible a new range of diagnostic and therapeutic interventions as well as the creation of biological systems with new properties. Proteins from the human body can now be produced and engineered on the basis of genetic information and used as drugs, known as biopharmaceuticals. New advanced medical therapies are being developed in which human genes, cells and stem cells are used as therapeutic agents. The emergence of genomics is creating a huge knowledge base for a deeper understanding of health and disease on a molecular level, offering prospects for early diagnosis and prevention of disease, more targeted and individualized therapies, and the identification of new drug targets on a molecular level. Synthetic biology has emerged as a new engineering science which uses synthetically produced genetic sequences to re-engineer living cells. In the

future, complete synthetic genes may be used as a tool to transform cells into biological factories or agents with a highly artificial nature, based on so-called minimal genomes as a cellular 'chassis.' In addition to new biotech tools, 'infotech' tools which create new options for monitoring and manipulating the human brain are also becoming available. The living brain can be studied with modern neuroimaging technologies and new systems have been developed which enable interventions in the brain by connecting it to electronic devices. What used to be science fiction is now becoming scientific reality: the direct interfacing of the brain with computers. Neuromodulation and brain-computer interfaces which use both invasive and non-invasive tools to support, restore or augment brain or mental functions are currently being developed.

New types of interventions in living organisms, the human body and the brain prompt policy makers to reconsider established ways of dealing with the issues of safety, liability, privacy, bodily and mental integrity, and informed consent. The rise of synthetic biology gives new reason for concerns about biosafety, biosecurity and intellectual property. With the rise of molecular medicine, major ethical, legal and social issues have to be addressed, such as how the increasing amounts of personal genetic and medical data are obtained and stored, what the information means and how it can be interpreted or used. Neural engineering of the brain – especially neuromodulation – is a form of behavioural engineering which is still at a very experimental stage and may result in unexpected changes in personality, which makes questions of safety, liability, bodily integrity and informed consent particularly sensitive in this area. Moreover, many of these new types of interventions in the human body and brain are driving the current debate on human enhancement.

5.3.2. Lifelike Artefacts

In most fields of bio-engineering the creation of lifelike artefacts remains a future prospect. As a long-term goal in engineering the body, we can observe a paradigm shift from restoring bodily functions to regenerative medicine – involving the (re)generation of tissues – and eventually to completely biologically derived artificial organs. In the field of synthetic biology, researchers have the long-term ambition of creating 'proto-cells' as artefacts with the properties of life, starting from non-biological molecular building blocks. An important engineering approach in brain research is attempting to mimic the brain with software in virtual representations, hardware in supercomputers and wetware in cultured neuronal networks, thus bringing the fields of IT and neuroscience together with the aim of developing a deeper understanding of the brain. The most tangible, albeit still modest, achievements in creating lifelike artefacts are found in the field of artificial intelligence, where researchers are working on the development of animalistic, humanoid and social robots with capacities to interact and to adapt and learn in response to new

situations. In addition, forms of artificial intelligence with the ability to interact with users and also to intervene in their behaviour may be embedded and distributed within smart environments.

The new kinds of biologically derived and lifelike artefacts raise questions regarding the commodification of bodily materials and the socio-psychological and legal implications of the further penetration of intelligent artefacts into everyday life. The increasing ability to use and engineer materials derived from the human body for technical and engineering purposes requires reflection and deliberation on the ethical and legal status of bodily materials considered as 'goods' and what it means to use this material in medical or other socio-technical practices. Moreover, also technologies that are meant to be used within the human body, for example stem cell therapy, are being discussed in the current debate on human enhancement.

The introduction of increasingly independent robots into human environments will raise special safety and perhaps also liability issues, while privacy issues will gain new significance in relation to intelligent systems which collect and store personal data with the aim of becoming more adaptable to the preferences, needs and emotional states of individual human users. Besides, new moral and human identity issues derive from these technologies. For example, to what extent is it allowed to employ artefacts that can simulate friendship (social robots) or that are able to influence people's behaviour (for example, persuasive technologies)? And what about military drones that enable remote killing and raise questions about to what extent the usage of these artefacts dehumanise the enemy?

5.3.3. Blurring Boundaries between Humans and Technology

NBIC convergence points to a future in which the distinction between biology as a science of life and engineering as a science of artefacts will get blurred and may in the end even disappear. The techno-sciences have thus become engaged in 'making perfect life,' with 'life' conceived of as a phenomenon that can be engineered, i.e. controlled and constructed. The two bio-engineering megatrends 'biology becoming technology' and 'technology becoming biology' are blurring the boundaries between biology and technology, including the boundaries between nature and technology, the living and the non-living, and human bodies and brains and machines. Accordingly, the growing interaction between biology and technology will increasingly challenge familiar, value-laden categories that are deeply rooted in the history of our culture, such as the distinctions between 'life' and 'matter' or 'nature' and 'machine'.¹⁹ In the final section we want to clarify the importance of both bio-engineering megatrends for the human enhancement debate and address the question of what does it mean to be human in the 21st century.

5.4. Conclusions

The human enhancement debate should not only focus on technologies inside the body, but also include technologies outside the body that may improve the performance of the human body or brain. So far, the human enhancement debate has basically focused on technologies that work inside the human body or brain. The Making *Perfect Life* project shows that bio-engineering in the 21st century will increase that set of technologies. The comparison of DBS and EEG neurofeedback illustrates that both technologies inside and outside the brain may enhance the performance of the brain. This shows that the current focus within the human enhancement debate on technologies that are used inside the body should be questioned. More fundamentally, the finding that bio-engineering in the 21st century – that is, the two megatrends ‘biology becoming technology’ and ‘technology becoming biology’ – is blurring the boundaries between humans and technology shows that this focus is problematic.

Technologies that work outside the body but influence human performance also raise issues of consent and autonomy: is it morally permissible to use these technologies on unknowing subjects? Smart environments, lighting, or aerosolised chemicals to alter moods can be used without people knowing what their function is and perhaps even without them realising that technology is being used at all. Is this right or should people always consent to the use of enhancement technologies? If we include this type of technologies in the human enhancement, the debate will shift its focus towards current technologies, instead of futuristic scenarios. The current human enhancement debate, it seems, is dominated too much by highly speculative long-term visions of a future in which human embryos might be selected on the basis of a full pre-implantation genetic analysis; embryos might even be created from artificially derived gametes; and brain activity might be controlled with deep brain stimulation or other devices. These speculative enhancement technologies also include genetic engineering to alter human beings radically. If the focus in the debate on bio-engineering is too much on speculative human enhancement technologies, we run the risk of ignoring more relevant and pressing current issues. Our description of DBS and EEG neurofeedback shows that these technologies, that have the potential to improve the mental performance of the human brain, are already raising a number of social and ethical issues that challenge regulatory systems. In order to reduce the risk of such speculative ethics,²⁰ it helps to investigate how a certain technology impacts on existing and new social practices.²¹

A similar argument is made far more strongly by Allenby and Sarewitz in *The Techno-Human Condition* – an insightful critique on the current human enhancement debate – where they plead for discussing the impact of (human enhancement) technology on three levels: the *direct physical impact* of technology, the way technology influences a certain *socio-*

technical system and related social and cultural patterns; and technology's impact on *global trends*.²² These authors argue that the influence of human enhancement technologies should not only be discussed on the instrumental level of improving individual bodies or brains, as is happening now. Far more attention should be given to the way these technologies impact the techno-human condition, instead of only looking at how they influence the performance of the body or brain per se.

In the year 2000, Alvin Toffler asked: What does it mean to be 'human'? This never was an easy question to answer, and NBIC convergence will make this question both harder and more relevant. In order to fully address Toffler's question, it is not sufficient to focus on technologies inside us. We should be aware of and include into the debate all kinds of 'intimate technologies,' i.e. technologies inside us (like cochlear implants or DBS), close to us (like EEG neuromodulation), between us (like social media), technologies that have a lot of information about us (huge databases), and technologies like us (for example, robots and smart environments).

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¹ Toffler, 2000.

² Roco, M.C. and W.S. Bainbridge, 2002.

³ *Ibid*, 2002, 1.

⁴ Van Est *et al.*, 2006.

⁵ For different definitions see, for example, Savulescu *et al.*, 2011, pp. 3-18.

⁶ Douglas, 2007.

⁷ Van Est *et al.*, 2008; Coenen *et al.*, 2009.

⁸ De Ruyter, 2011.

⁹ Van Est *et al.*, 2009; Van Est and Stemerding, 2011; Van Est and Stemerding, 2012a.

¹⁰ Science and Technology Options Assessment (STOA).

¹¹ Van Est and Stemerding, 2011.

¹² Van Est and Stemerding, 2012a.

¹³ This section is based on Van Keulen and Schuijff, 2012.

¹⁴ Council Directive of 20 June 1990 on the approximation of the laws of the Member States relating to active implantable medical devices (90/385/EEC).

¹⁵ There are three Directives for medical devices: the Medical Devices Directive (93/42/EC), which regulates most devices, the Active Implantable Medical Devices Directive (90/385/EC), which is discussed in this section, and the In Vitro Diagnostic Medical Devices Directive (98/79/EC).

¹⁶ Council Directive of 14 June 1993 concerning medical devices (93/42/EEC).

¹⁷ This section is based on a text that was earlier published in Van Est and Stemerding, 2012b.

¹⁸ Cf. Arthur, 2009, pp. 206-208; Van Est *et al.*, 2009.

¹⁹ Swierstra *et al.*, 2009.

²⁰ Nordmann, 2007.

²¹ Cf. Van Est *et al.*, 2008, pp. 45-46.

²² Allenby and Sarewitz, 2011.

Chapter 6

DEEP BRAIN STIMULATION AND ENHANCEMENT

by Henriette Krug

DEEP BRAIN STIMULATION AND ENHANCEMENT

by **Henriette Krug**

Deep brain stimulation is a neurotechnique which is used to suppress symptoms of neurological or psychiatric symptoms by electronic stimulation of selected neural targets in the human brain. This contribution centres on the perspective of DBS inducing neural enhancement. By focusing on the subject of unintended psychiatric side effects of DBS applied in non-psychiatric patients, this essay aims to indicate that there may be a growing field of possibilities of human enhancement induced by deep brain stimulation. This is – up to now - a matter of unintended adverse events but at the same time possibly an impressive incentive for the supporters of human enhancement.

6.1. Introduction

Deep brain stimulation (DBS) is a neurotechnical treatment option which is used in several different disorders to suppress pharmacologically intractable symptoms by electronic stimulation of selected neural targets in the human brain. For this therapy electrodes are implanted by using a stereotactic localizing system into the target neural nuclei located in the depth of the two brain hemispheres. Via subcutaneous leads the electrodes are connected to an internal pulse generator, usually located in the chest or abdominal wall. This device contains a battery, which works in a way similar to a cardiac pacemaker by generating electronic impulses. These impulses modulate the activity of the neural target and the neural circuits the target is involved in.¹

Since the pioneering works in the late 1980s by Benabid and his colleagues, DBS has become a well-established therapy in the treatment of severe and advanced motor disorders, e.g. Parkinson's disease, general and segmental dystonia, as well as certain tremor syndromes. Its efficacy and safety have been demonstrated in various randomized and controlled trials. There are several well-tried neural targets which vary according to the disease which is going to be treated. Despite the rather long history of DBS, the mechanisms through which it works are still not completely understood.

Due to its impressive clinical results, DBS is being applied to a growing number of neurologic disorders, like cluster headaches or epilepsy, and more recently even in therapy-refractory psychiatric disorders like Tourette's syndrome, obsessive-compulsive disorder and treatment-resistant depression.² Keeping in mind the complexity of brain circuits and neuronal networks, this rapid expansion of DBS in treating psychiatric disorders has raised scepticism and discussions on this kind of intervening in the human mind. Among other

points this critical debate focuses on the risks and ethical implications of DBS-induced shifts in the patients' individuality and personality. It also focuses on the impact of applying DBS for further possible uses, and in particular on its application for purposes of enhancement.³

This contribution will centre on the perspective of DBS-induced enhancement. We start with an overview of the procedure in general, its indications, effects, and possible side-effects (section 6.2.). Dwelling on the subject of psychiatric side effects, we will then present some case reports of DBS-patients suffering from Parkinson's disease, who recognized side-effects related to their affect being evocative of enhancement improving the mood (section 6.3.). Some case reports of patients with DBS for other experimental indications will be cited to illustrate the rapid expansion of DBS applications (section 6.4.). In conclusion, this essay will aim to explore in which way there might develop a growing field of DBS applications providing opportunities for enhancement. Until now, enhancement has rather been a matter of unintended adverse events but there may at the same time be an impressive incentive for the supporters of human enhancement (section 6.5.).

6.2. DBS and its Possible Side-Effects

To illustrate the efficacy of the treatment with DBS some exemplary data will be cited. These data demonstrate the effects of DBS in patients suffering from Parkinson's disease who underwent DBS implantation into the subthalamic nucleus (STN), which is currently the most favoured target for DBS in Parkinson's disease. This is a progressive multisystemic disease where the main motor symptoms are a resting tremor, muscle stiffness, slowness and the inability to initiate movements. DBS is able to reduce the motor symptoms by about 50 to 60% and to improve activities of daily living by 44%. This efficacy enables the physicians to reduce the dose of the patients' former pharmacological treatment by about 40 to 50%, causing a reduction in bothersome side effects of about 50%. So subthalamic nucleus-DBS presents an impressive treatment option with striking effects on the symptoms of Parkinson's disease.⁴

Side-effects of DBS are classified into two categories. First there are risks related to the surgery, like infections or bleeding, or to technical problems such as lead fracture or battery failure. These risks are the same in all applications. Side-effects are also reported with regard to the stimulation itself. These effects vary according to the localisation of the electrodes and are not the same in all indications of DBS. The typical side-effects caused by the stimulation of the subthalamic nucleus are: eyelid-opening apraxia (19 %), disabling dyskinesia (16%), weight gain (on average 3 kilograms) (92%), dysarthria (9%), tetanic muscle contraction (5%).⁵ Moreover, and this is interesting with regard to the subject of neuroenhancement, DBS on the subthalamic nucleus is associated with non-motor effects related to cognitive functioning, emotion and behaviour. There are reports of a development of depression and apathy, of psychotic symptoms, manic episodes

and perioperative confusional symptoms, increased suicidality, emotional lability as well as impulse control disorder like pathological gambling, hypersexuality or pathological shopping.⁶ Due to inconsistent methods and measured parameters of the surveys there is a wide variety in the incidences reported and published to date.⁷

6.3. Psychiatric Side Effects of DBS in the Perspective of Enhancement: Case Reports

Case Report 1

One case report published by Wojtecki *et al.* impressively demonstrates the affective lability induced by subthalamic nucleus-DBS.⁸

A 69-year-old patient was selected for subthalamic nucleus-DBS of medically refractory tremor-dominant Parkinson's disease. He had no former history of cognitive impairment or psychiatric disease. [...]. In a preoperative baseline screening for cognitive and emotional function he scored normal [...]. Electrode localization was planned on stereotactic CT and MR image fusion and placement was determined by macrostimulation effects. Two days postoperatively the patient presented mirthful laughter when stimulated on medication bilaterally with 3.5 Volts (V), 60 microseconds (μ s), 130 Hertz (Hz) [...]. He laughed at trivial things, told jokes and laughter was contagious, but good suppression of the tremor was obtained [...]. When the generator was deactivated the tremor recurred after a few seconds and the patient fell into a depressed mood and started crying [...]. Over the course of 53 months the patient was seen several times for follow-up. Laughing could not be induced again during various programming sessions [...] However, sad emotions and crying could be induced again 9 and 37 months after implantation by rapid amplitude increase up to 5.5 V or by an abrupt turning off [...].

Case Report 2

Krack *et al.* report two patients, in whom chronic stimulation of the subthalamic nucleus at a therapeutic level with the best antiparkinsonian effect induced mirthful laughter. To quote one of their case reports:

A 47-year-old male patient with Parkinson's disease for 8 years underwent bilateral subthalamic nucleus stimulation. [...]. Four months after surgery, bilateral monopolar stimulation using stimulation parameters as low as 2.5 V/60 ms/130 Hz induced severe dyskinesias, [...], the patient starts laughing, despite his severe dyskinesias. At that time it was not possible to continuously stimulate with these parameters for more than a few minutes because of the intensity of the dyskinesias[...].⁹

Regarding these side-effects related to emotion and behaviour, DBS of subthalamic

nucleus seems to be a special case. Up to now there are no reports of similar psychiatric or neuropsychological adverse effects in patients treated with DBS for other motor disorders like dystonia or tremor with the electrodes located at other targets as the ventral intermedialis thalamic nucleus or the *globus pallidus internus*.

The exact mechanisms underlying the side-effects on emotion and behaviour caused by subthalamic nucleus-stimulation remain uncertain. But as the subthalamic nucleus comprehends sensorimotor, cognitive and limbic parts, subthalamic nucleus stimulation is supposed not only to affect motor but also limbic loops which are involved in the regulation of behaviour and emotion which could be a possible mechanism to induce behavioural changes during subthalamic nucleus-DBS.¹⁰

The cases presented before are extreme ones. These patients did not experience enhancement but rather intense emotions of psychiatric syndromes like depression or hypomania. But in reference to the question of enhancement induced by DBS they impressively demonstrate the ability of DBS to change the patients' mood and behaviour and perhaps even individual personality. The following case reports, the first taken from the author's daily clinical routine, the second taken from an internet platform of patients suffering from Parkinson's disease, will make it clear that dealing with the psychiatric side-effects of non-psychiatric DBS provokes questions similar to those discussed in the debate about enhancement. Therefore it seems reasonable to discuss the psychiatric side effects of DBS from the point of view of enhancement.

In the case of subthalamic nucleus stimulation the intimate connection of neural circuits mediating movement, cognition and emotion makes it sometimes impossible to reach the best possible improvement of motor symptoms without producing side-effects. So it may happen that a physician trying to optimize the stimulation parameters – with the objective of a pure reduction of motor symptoms – has to choose an adjustment with which parkinsonism is diminished less than it could be because otherwise intolerable psychiatric symptoms would occur.

Case Report 3

Four months after the implantation of DBS, a 72 year old patient with Parkinson's disease came into the clinic for in-patient testing and adjustment of the stimulation parameters. During one of the test adjustments, there was a considerable relief from motoric parkinsonian symptoms, but the patient developed quite a manic episode. He felt euphoric, wanted to present employees and other patients with money, repeatedly expressed lewd behaviour toward the nurses and walked loudly around the ward whistling with unrestrained mobility. Unlike the employees and the surrounding patients, he felt good in his state, 'entirely himself,' he said. In order to diminish the mania the stimulation

parameters were re-adjusted. It resulted an outcome with aggravated motor symptoms but a normalized psychiatric condition. The patient became quite disappointed and remarked: "This has been the best adjustment of my life."

Beyond this constellation it may also happen that a physician adjusting the stimulation parameters has to find a compromise between a gradual reduction of motor symptoms and an incidence of psychiatric symptoms which is as slight as possible.

Case Report 4

This report comes from a Parkinson's disease patient stimulated in the subthalamic nucleus, who describes his experience like this:

"When I turned on the device after such a long time, I immediately felt something of a jar. Everything went dark, I felt dizzy, and I was unable to speak. After several minutes, I gradually got better and my condition normalized. Concerning the sensation: my general condition quickly improved and my endurance got much better and, get this, my mind made a quick jump into the positive, like I would have never imagined before. In this situation, we can certainly debate if and how much the procedure (DBS) changes personality and how far it even changes character traits. However, the fact of the matter for me is this: I feel much better, yes I feel good. If my personality did in fact change, I think I will cope!"¹¹

These four cases demonstrate changes of mood and behaviour induced by DBS, two in an extreme and two in a moderate manner. The two latter case reports demonstrate the existence of enhancement as an unintended side-effect. The reports of these patients treated with DBS applied in the best established indication, Parkinson's disease, and stimulated in the most favoured target, the subthalamic nucleus, present a special challenge: enhancement induced by DBS not as the primary goal of treatment but as an unintended effect. Here, enhancement by DBS is already real – but unintended. Certainly it can be discussed whether or not this phenomenon is rightly called enhancement. But if enhancement refers to 'beneficial effects of medical treatment in the absence of medical need' it seems to be legitimate to apply this point of view. The aim of DBS in these cases had been the reduction of motor symptoms of Parkinson's disease, which was achieved. But it effected even more: patients also experienced a change of mood which they did not want to abandon.

The occurrence of those side-effects raises pressing questions for medical practice, similar to those in the debate about pharmacological enhancement.¹² What is the relationship between medical treatment and improving quality of life? Do these techniques include changing the 'human condition' and if so, is this problematic? What is the relationship

between these forms of treatment and patient autonomy? How do we deal with safety issues? Are we allowed to accept mild psychiatric changes, like the patients feeling well, or 'more themselves,' in order to reach best possible motor effects? Who can anticipate the long-term effects? And if we accept such mental changes, we have to answer the quantitative question: to what degree? What is the threshold value? An answer must also be found to the qualitative question: which kind of enhancing effects are acceptable, and which are deemed unacceptable? Should we approve of patients feeling 'more themselves' but avoid their feeling 'someone else?' And on whose judgments should treatment decisions be based? The physician's? The patient's? Their relatives? Or all together? And what about distributive justice? Who should pay? In the case of scarcity: on what bases do we decide who will be helped and who will not?

6.4. The Rapid Process of Exploring Further DBS-Indications in the Perspective of Enhancement

In recent years there has been a rapid expansion of indications, and the investigation of further fields of applications eagerly goes on. One typical pattern triggering the step to explore a new indication of DBS repeatedly observed in this process is the detection of effects by serendipity – pleasant surprise. For example, the exploration of subthalamic nucleus stimulation for the treatment of obsessive compulsive disorder (OCD) was set up among others by the observation of patients with Parkinson's disease, who additionally suffered from OCD. Once treated with subthalamic nucleus-DBS, they experienced an alleviation of their parkinsonian symptoms as well as of the symptoms of OCD.¹³ To illustrate this rapid progress catalyzed by serendipity we will quote one last case report, published by Hamani *et al.*:

"A 50-year-old man with a life-long history of obesity (190.5 kg; body mass index 55.1 kg/m²) did not respond to multiple treatments [...]. Given his resistance to treatment, the concern with the long-term health consequences of morbid obesity, and our group's long-standing interest in functional neurosurgery and DBS, he was referred to consider the possibility of a neurosurgical treatment. Hypothalamic lesion surgery had been used previously to treat obesity, but we believed that the safety and reversibility of DBS offered a significant advantage.¹⁴ [...] The patient agreed. During surgery, in order to identify potential sites to suppress appetite, the effects of the stimulation were already tested in the operating room. Unexpectedly, the patient reported sudden sensations that he described as 'déjà vu'.¹⁵ [...] He reported the sudden perception of being in a park with friends, a familiar scene to him. He felt he was younger, around 20 years old. He recognized his epoch-appropriate girlfriend among the people. He did not see himself in the scene, but instead was an observer. [...] As the stimulation intensity was increased from 3.0 to 5.0 volts, he reported that the details in the scene became more vivid. [...] There were no reproducible changes

in his subjective sensation of hunger with stimulation on a self-rated 1 to 10 scale with these settings.¹⁶ [...] The effects of stimulation at each contact were examined at the first office visit, 2 months after hospital discharge. On turning on the electrical stimulation, we induced autobiographical memory effects that were similar to those previously observed in the operating room.¹⁷

The authors concluded that “just as DBS can influence motor and limbic circuits, it may be possible to apply electrical stimulation to modulate memory function¹⁸ which led them to test the target for the DBS-treatment of Alzheimer’s disease. Already two years later the same working group presented the results of a pilot trial of DBS in 6 patients suffering from Alzheimer’s.¹⁹ The data suggested “possible improvements and/or slowing in the rate of cognitive decline at 6 and 12 months in some patients. There were no serious adverse events”.²⁰ So the authors concluded that DBS was a treatment option with good prospects to modulate dysfunctional cognitive and memory circuits in Alzheimer’s disease which should be tested in further trials.

In this case a person with obesity, who pre-operatively achieved normal results in neuropsychological tests, was treated with DBS targeting the hypothalamus in order to obtain weight reduction. He experienced a surprising side-effect: a modulated memory with improvements in some cognitive domains. This detection resulted in an explorative application of hypothalamic DBS in patients suffering from functional impairment in their cognitive and memory functions due to AD. Observing the dynamics in the process of exploring new targets and indications of DBS and regarding the point that the triggering patient was mentally healthy and did not receive DBS to treat cognitive deficits but his obesity, it is a small step to ask for an opinion about the application of DBS for cognitive or other enhancement purposes. In a qualitative study published by Mendelsohn *et al.*, neurosurgeons as providers of DBS and other neuromodulating technology were asked about their attitude toward surgical interventions for neuromodulation.²¹ In the case of treatment of refractory mental illnesses that was safe and effective, no participants raised moral objections. In the case of treating non-pathological states in healthy individuals, however, the majority raised concerns regarding ethical issues.²² One year later the same working group published data from an online survey with 84 functional neurosurgeons about the current practices of psychiatric surgery and attitudes towards the future trends:²³ 48.6% considered surgery for memory enhancement ethically questionable. Surgery for the purpose of altering non-pathological traits such as selfishness or greed was refused by 62.5% due to ethical reasons. In the case of implanting a technology for cognitive enhancement 32.9% approved, 38.4% refused and 28.8% were unsure. Asked about future developments, more than 50% of the participants expected that within 50 years DBS or another technology will be used for the purpose of cognitive enhancement.²⁴

6.5. Conclusion

Until now there is no application of DBS for the purpose of neural enhancement. It is only applied to patients suffering from severe and advanced forms of neurological or psychiatric diseases which are refractory to pharmacological treatment. There are both practical and scientific limits as well as ethical concerns with regard to applying DBS for enhancement purposes. But two observations make it clear that there is an urgent need for an ethical discussion about the application of DBS for enhancement.

First, in a small sample of cases where patients suffering from Parkinson's disease were treated with subthalamic nucleus DBS, there may occur neuropsychiatric side-effects resulting in a modulation of their mood. In effect, this makes the existence of enhancement by DBS a reality already, albeit in the form of unintended but, in some cases welcomed, side effects. Physicians thus need criteria for dealing with requests for pharmacological enhancement in a morally responsible way. With the growing number of indications and neural targets of DBS it is conceivable that the number of persons experiencing side-effects with enhancing effects on non-pathological states of mood, cognition or physical states will increase.

Second, at present there is something like a sense of a new era about to dawn. Regarding the growth in the number of indications for DBS, and the euphoria accompanying this process, we have to reckon with the possibility of more unexpected findings when further brain areas are tested with DBS. Considering the issue of Prozac and similar drugs, such unintended results might stimulate the debate on trying DBS for enhancement purposes.

Paradoxically, this 'trigger of serendipity' could be used as an argument backing up two kinds of trends: as an encouraging argument for supporters of enhancement, who are searching for the perfect target to optimize the human mind and body; or, on the contrary, as the limiting argument of its opponents, who are concerned about the unknown and incalculable consequences of manipulating the human brain. So, in conclusion, there are imperative arguments to bring forward the ethical debate about the scenario of DBS applications aiming at an improvement of mental or physical states which are not acknowledged to be a disorder.

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Chapter 7

THE HUMAN BODY AS CULTURAL PLAYGROUND WITH EMPHASIS ON THE FEMALE BODY

by Marianne Springer-Kremser

THE HUMAN BODY AS CULTURAL PLAYGROUND WITH EMPHASIS ON THE FEMALE BODY

by **Marianne Springer-Kremser**

From the broad spectrum of Human Enhancement, specific areas have been selected. The increasingly problematic handling of the diagnosis 'Depression,' followed by a high rate of infestation of the western-world population with psychotropic drugs is discussed. Secondly, the problem of economic globalization of the pharmaceutical market and its consequences is stressed and the debatable prescription of Ritalin for children with ADHD is addressed. Finally, the question is raised 'Who disposes of the female body?' Examples of internal and external bodily modification, imposed on women by sexual abuse and/or socio-political reproductive pressure and debatable aesthetic criteria are presented. We have to realise that what might be labelled as 'Enhancement' easily can be misused, with devastating consequences for the individual woman.

7.1. Introduction

The focus of this contribution is the vicissitude of the disposability of the human body, especially the female body. It will stress the culture-specific demands and the tensions arising from interactions within the well-established 'cultural demand' patterns, which are based on results of so-called scientific research and, on the other hand, the individual psychic or/and spiritual conditions.

I have had scientific and clinical experience as a psychiatrist, as former director of the Department of Psychoanalysis and Psychotherapy at the medical University of Vienna, as head of a Psychosomatic Liaison service of the Department of Gynaecology, and finally as a psychoanalyst. During my professional career the many facets of sufferings among female patients with regard to their bodies have consistently fascinated me as much as the pain inflicted by various institutions on the female body and psyche outrages me.¹

A broad spectrum of meanings is given to the term 'human enhancement.' It can actually refer to any attempt to overcome, either temporarily or permanently, the current limitations of the human body and mind using either natural or artificial means. In this contribution I will concentrate on techniques that are (or can be) used not simply for treating illness and disability, but also for enhancing human characteristics and capacities. Female reproductive capacities and consequently, the female body, open up a broad field for

‘enhancement techniques.’ These pertain especially to two areas. First, attempts are made to make changes in people’s mental states (nootropics). Antidepressant drugs are used not only to treat severe depression but also mild depression. Furthermore, amphetamines (Ritalin) are used to treat against Attention-Deficit Hyperactivity Disorder (ADHD), the most common psychiatric condition in children and adolescents. On a *physical level*, techniques are being developed (reproductive technology as pre-implantation genetic diagnosis) and applied for the purpose of fertility control and enhancing human reproduction. Another application on the physical level is internal and external body modification through the use of plastic and cosmetic surgery.

My approach, as I will try to show, is not totally condemnatory, but rather an appeal to open a critical debate and furthermore to demonstrate the necessity of using caution with regard to the possible misuse of certain technologies.

7.2. Focus on the Mind (Psychiatry)

So-called scientific tests with drugs in the field of psycho-neuro-enhancement to achieve certain aims are not new. In 1956 in his book *Mental Seduction and Menticide*, the Dutch general practitioner and psychoanalyst Joost A.M. Meerloo signified the totalitarian technique of breaking the minds and wills of political victims. He showed how extremely dangerous the application of certain medications can be in the hands of totalitarian regimes. The author, formerly chief of the Psychological Department of the Netherlands Forces, in part bases his analysis on his own experiences in a Nazi concentration camp.²

The development of anti-depressive drugs and neuroleptics has helped millions of patients in many countries to lead a life under more humane conditions than would be the case without these treatments. Of that there is no doubt. However, we have also significant proof of the misuse of psychotropic drugs. Critics of totalitarian governments have been diagnosed as schizophrenics and sedated with antipsychotics – where not enough proof for an accusation before the court can be found.³

In many cases it seems doubtful whether these substances are prescribed for healing purposes only or rather for their psycho- and neuron-enhancing capacities. In the following we will discuss three areas in which the prescription of psychotropic drugs seems highly questionable. There is, firstly, the increasingly problematic handling of the diagnosis of *depression*, followed by the over-prescribing of psychotropic drugs to many people in Western countries (section 7.2.1.). Another problem comes with the economic globalisation of the pharmaceutical market (section 7.2.2.). Finally there is the debatable practice of prescribing of Ritalin for children with ADHD (section 7.2.3.).

7.2.1. Depression

As Elisabeth Roudinesco has remarked, psychological suffering nowadays seems persistently labelled as 'depression,' both by psychiatrists and by lay-people.⁴ This diagnosis is also often applied to somatic conditions, e.g. chronic pain, when no somatic substrate can be identified. The diagnosis – often based on a questionnaire without a face to face diagnostic interview – is followed by the prescription of a psychotropic drug. This exclusively symptom-orientated approach takes no account of individual patients and their personality structure. Moreover, critical events in their lives prior to the onset of the depression, let alone questions about any early losses in the patient's life, go largely unattended. Since 1970 scientific research focused on the pathogenetic role of life events, Brown and Harris and Schepank *et al.*, among others, have shown in their field surveys that the social and psychodynamic origin of depression can be linked to early loss of beloved people and can make a person prone to develop depression in later life.⁵ Since S. Freud's paper 'Mourning and melancholia,' published as early as 1916, we know that depression (or to use the old term, 'melancholia') can be understood as an exaggerated (if not pathological) form of mourning.⁶

In so-called 'postmodern society' mourning a loss seems to be virtually forbidden. However, prohibiting mourning (as well as producing guilt feelings) is the *via regia* into depression. Even if nowadays there never is – and in psychoanalysis never was – any doubt about the fact that in the aetiology of any psychic suffering there is interaction between the intrapsychic, biological, and environmental factors, the dominant clinical practice concentrates exclusively on the biological facts. As a consequence the treatment often exclusively concentrates on the prescription of anti-depressive drugs, while neglecting other etiological facts. This procedure seems clearly connected to the economic interests of the pharmaceutical industry.

But critical voices concerning this practice are becoming more and more prominent. Under the headline 'Talking back to Prozac' three books were published independently in 2007.⁷ Surveys and original papers confirm the widespread observation that women are more likely to be diagnosed as depressed than men (2/3 women, 1/3 men).⁸ The numbers of psychotropic drugs prescribed for women are correspondingly much higher compared to those prescribed for men.⁹ Post-partum depression, unexplained infertility, menopausal complaints – all of these sufferings include losses but nevertheless figure as indications for psychopharmacological interventions, even when the depression is described as 'light.' The anti-depressive medication must in most of these cases not be regarded as helpful and rather prolongs the women's suffering.¹⁰ Actually the 'state of the art' treatment for mild depression is psychotherapy whereas for medium depression psychotherapy, in certain cases combined with anti-depressive drugs, is indicated. For cases of *major* depression the treatment with anti-depressive drugs is obligatory, yet also combined with psychotherapy.

The psychotherapeutic interventions have to be adjusted to the psychic and somatic condition of the patient in question.

Since 'light and medium depression' occur more often than the severe forms, 'state of the art' insights call for a reduction of the use of anti-depressive agents. In order to find other possibilities to make profit on a shrinking market, pharmaceutical companies seek to enlarge the spectrum of indications for use of the drugs. The current practice of the globalisation of clinical research by some pharmaceutical companies obviously promotes growth. Therefore it seems necessary to include a short section on this fairly new market strategy.

7.2.2. The Globalization of Clinical Research

In 2009, the *New England Journal of Medicine* published a paper on 'Ethical and Scientific Implications of the Globalization of Clinical Research' stating that pharmaceutical companies have embraced globalisation as a core component of their business models, especially in the realm of clinical trials.¹¹ This phenomenon raises important questions about the economics and ethics of clinical research and the translation of trial results into clinical practice: who benefits from the globalisation of clinical trials? What is the potential for exploitation of research subjects? Are trial results accurate and valid, and can they be extrapolated to other settings? Trends in the globalization of clinical research show that clinical trials increasingly occur on a global scale as industry and government sponsors in wealthy countries move trials to 'less wealthy countries.' The authors report that the number of countries serving as trial sites outside the United States has more than doubled in ten years, whereas the proportion of trials conducted in the United States and Western Europe has decreased.

The substantial cost savings by conducting trials in developing countries motivate companies to increasingly move phase 2 and phase 3 trials to places such as India and South America. A first-rate academic medical centre in India charges approximately \$1,500 to \$2,000 per case report, less than one tenth of the cost at a second-tier centre in the United States. Globalisation of clinical trials may also shorten the timeline for clinical testing. The large pool of potential research participants and the lower costs of research in countries such as China and India provide opportunities to accelerate recruitment. Clinical testing in developing countries is also attractive to pharmaceutical and device companies because it can help them overcome regulatory barriers for drug approval in these countries where the population size alone offers the promise of expanding markets.

A major concern regards the ethical and regulatory oversight of research involving human subjects in developing countries. Widespread disparities in education, economic and social standing, public health, and health care systems may jeopardise the rights of participants

in research projects. The authors also argue that ‘another question relates to the social ecology and genetic make-up of trial populations. Geographically distinct populations can have different genetic profiles, and these differences have been shown to be related to the safety and effectiveness of drugs.’ All this has a specific impact on psychiatric illnesses and their treatment with psychotropic drugs, meaning that an effect or a certain response to the application of drug, which was observed in a region of sub-Saharan Africa or South-East Asia, might not be comparable with the response of a patient diagnosed with the same illness in western Europe.

7.2.3. Attention-Deficit Hyperactivity Disorder (ADHD)

Professor Leuzinger-Bohleber and her team at the Sigmund Freud Institute in Frankfurt (Main) showed in their Research Project on Prevention of ADHD that diverse problems and destinies of children might be hidden behind this diagnosis.¹² These could include organic problems of the brain, early emotional neglect, traumatizing situations and conditions of children and/or of their parents, loss of a parent, cultural or institutional adaptation problems, or the ‘problems’ of a highly talented child. The use of medication such as Ritalin may make invisible not only the symptoms, but also the diverse aetiologies of this ‘disturbance.’ This may include that, even if the indications remain, no adequate therapy is offered. In addition the long term consequences of these amphetamines in children (besides symptoms such as sleeping disturbances and lack of appetite) have not been sufficiently reviewed. Besides the chemical interference with the developing brain, the risk of so far unknown psychiatric and neurological consequences in later life cannot be excluded. In Germany, approximately 150,000 Kindergarten children diagnosed with ADHD consume psychotropic drugs regularly, often without prior paediatric investigation, let alone child-psychiatric diagnostic interviews! Even if in some cases, after careful psychiatric investigation, prescribing the amphetamine might be indicated, it is alarming that in only a decade the prescription of amphetamines for small children has increased 270 fold. A further ethical challenge is the fact that children from disadvantaged families, often migrant families, are more often diagnosed with ADHD and are more prone to use amphetamines.¹³

Critics argue that ‘human enhancement’ is a term loaded with eugenic undertones since it may imply attempts to improve human hereditary traits in order to attain a universally accepted – or imposed – ideal of biological or mental fitness that does not leave room for disagreement or plurality. It may also go at the expense of human biodiversity and neurodiversity. ‘Human enhancement’ can therefore evoke negative reactions far beyond the specific meaning of the term. Furthermore, critics argue that enhancements which are self-evidently good at first sight (such as ‘healthier’ and ‘with fewer diseases’) are more often the exception than the rule. Moreover, even these may involve ethical trade-offs, as the controversy about ADHD demonstrates.¹⁴

7.3. Female Reproductive Capacity and Preimplantation Genetic Diagnosis

A woman's wish for a child is as old as humankind. Our present socio-cultural scenario seems to produce complex demands, which manifest themselves in various conflicts and symptoms. The idealization of scientific progress, including progress made in reproductive technology, fosters the idealization of the 'baby to be.' Mothers and parents-to-be not only want a child but they want a beautiful, not handicapped, lovely child. This wish is reinforced by what is called 'reproductive confidence.'

One fundamental way to measure the health of a society is to gauge its reproductive confidence, i.e. the fact that unless infertility has been diagnosed, women and men consider themselves as 'fertile.' On an individual level, there are many social and biological factors that can undermine this confidence. Fear of transmitting a genetic disease to one's child can have a major impact on reproductive confidence, whether or not the fear is well founded or not. At the third Symposium on Bioethics ('Medically assisted procreation and the protection of the human embryo'), held at the Council of Europe, the British clinical geneticist Marcus Pembrey gave a presentation on 'Ethical issues in pre-implantation genetic diagnosis' (PGD). He argued that genetic diseases and the wish for a child bring together three areas of biotechnology that have each engendered their own ethical debates: in vitro fertilization, genetic testing, and prenatal and pre-implantation diagnostic for the selective establishment or continuation of a pregnancy. Pembrey stated that the overall goal of medical genetics is 'to help those families with a genetic disadvantage live and reproduce as normally as possible.' PGD, according to Pembrey, offers opportunities to four categories of situations:

- (1) Where a woman with a known genetic risk has had a tubal ligation because (acceptable) prenatal diagnosis was not available at the time;
- (2) Where a woman is having in-vitro fertilization because of infertility and also happens to face a high genetic risk;
- (3) Where a woman with a known genetic risk has had a disastrous reproductive history with repeated selective abortions following prenatal diagnosis;
- (4) Where a woman with a known genetic risk has an absolute objection to abortion on moral and religious grounds.

Increasingly, requests for PGD in the United Kingdom are made by women who do not wish to contemplate an abortion but dare not start a pregnancy because of their high genetic risk. In these circumstances, discussion of the reliability of PGD becomes a key part

of the non-directive counselling process, aiming at an informed decision. An example is the case of a young woman who witnessed her mother falling ill, terribly suffering and finally dying from Chorea Huntington. When the young woman wanted to become pregnant, she contacted the Department of Genetics and from there was referred to the Department of Psychoanalysis and Psychotherapy, where a short-term psychotherapy helped her to come to an autonomous decision.

As a woman's body and mind, and indeed her whole personality, are affected by these problems, the quality of the services, counselling and ethical safeguards has to be of the highest possible standard. This is an ethical issue. Non-directive counselling, which respects the value system of the woman in question and which does not impose the counsellors' values (gynaecologists and other health care professionals) is of paramount importance. There is a great deal to be done in training health professionals in genetic counselling and in the development of the appropriate services.¹⁵

7.4. Focus on the Body: Internal and External Body Modification

Internal bodily changes aim at changing bodily functions

Our present socio-cultural scenario produces some complex situations. These manifest themselves in conflicts and symptoms with which we come face to face in the psychosomatic outpatient clinic. In addition, technical developments, especially fertility technologies and cosmetic surgery, sometimes intervene and foster self-damaging actions.

Intrapsychic and externalized dramas as a consequence of a sexual trauma often revolve around the disposability of a person's own body, i.e. around the question who 'owns' and decides about the body. The following case description may serve as an example. A twenty-two-year-old patient requested a hysterectomy, however without somatic indication. The young woman was referred to the gynaecological outpatients' clinic by her gynaecologist. She had a history of long-lasting sexual abuse by her stepfather since childhood, with apparent toleration of this crime by her mother. The experience of being totally at the mercy of others as in sexual assault, rape or incest, may thus cause body-violating mechanisms in the victims. Perhaps these mechanisms can be interpreted as a desperate attempt to re-establish power over one's own body. Alessandra Lemma describes different unconscious fantasies, which might underpin body modification, cosmetic surgery, and also the intention to dispose of the uterus as in the case of this young woman. One of these fantasies seems to be 'the reclaiming fantasy,' where one's own body could be experienced as the container of other's (the mother's) hostile projections.¹⁶ Lemma suggests that 'removal [...] of a body part thus serves the function of rescuing oneself from an alien presence, which is now felt to reside within the body. The modification (here the hysterectomy) is driven by what I am calling the reclaiming fantasy.'¹⁷ For this special patient, the uterus and its functions, representing the mother imago, seem

to be perceived as 'bad internal objects' from which she had to be separated. The wish for body-modification can be seen here as an endeavour to accentuate the disposability of the body, to establish borders with the mother (the mother's body), to remove the body from maternal control and to symbolize sexual maturity, to be an 'adult.'

External bodily changes

The wish for cosmetic/surgical alteration of individual body parts could be a pursuit to match an idea of 'beauty' or maybe to fulfil other unconscious demands. As Freud observed: 'Regrettably, psychoanalysis has not much to say about beauty.'¹⁸ Early female psychoanalysts contributed to this topic. One example is Joan Riviere who with her concept of 'femininity as a mask' has captured the significance of 'beauty' in a given culture.¹⁹

Who has the rights over the female body? Is it the individual woman? Which institutions presume to dispose of the female body, and by what means? What desperate measures are undertaken by women in order to prove – partly for themselves, partly in connection with their environment – that they are in possession of the right to dispose of themselves – that they are 'mistresses in their own house'? Throughout their lives, not in the least under the conditions of pregnancy and childbirth, women are directly or indirectly at the mercy of institutions, the most evident being the medical system. The increasing medicalisation of and economic factors in the female life cycle reinforce this vulnerability.

The subjective image of disposability therefore is of interest. What are the relevant fields of interaction between psycho-sexual development and the growth and differentiation of internal and external object relations, which cause the body's disposability or else the helpless admission of disposability through others? The self-destructive dimensions of desperate attempts to exercise the right to dispose of one's own body, together with the attempts to master the fear of this destructive power, and the attempts to avert the persecution by internalized 'evil,' are truly shattering.

The fact that individual institutions or their representatives assume that they have a right to dispose of the bodies of others, especially those under their care, does not only affect women. This can be seen from the current dispute about sexual abuse within institutions, including the Christian churches.

7.5. Conclusion

As a psychoanalyst I am well aware that psychoanalytic care involves aspects of psycho-enhancement. However, this can only be pursued under clearly defined ethical conditions, one of which is the patient's informed consent. Every form of human enhancement, apart from its potential beneficial effects, is prone to be misused. In many societies and parts of

the world, women suffer from structural gender inequity and are all too often at the mercy of others – mostly men. But there is hope and international agencies are called upon to be watchful and comply with ethical standards.

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Chapter 8

HUMAN ENHANCEMENT FROM THE ORTHODOX POINT OF VIEW

by Stavros J. Baloyannis

HUMAN ENHANCEMENT FROM THE ORTHODOX POINT OF VIEW

by **Stavros J. Baloyannis**

The Orthodox Church is very understanding of human weakness and compassionate for human pain. Orthodox doctrine perceives the healing from illness by medical professionals and by the developments of the biotechnical sciences and medical research as a God-given art, helping in healing purposes. Orthodox theology recognizes an important place for any human effort, striving and cooperating faithfully with God's will, since the human body is a temple of the Holy Ghost, where God is glorified. Orthodox medical ethics, based on the principle of the divine economy (οικονομία), remain unaffected by the ambitious plans of human progress, productivity, enhancement and financial profits. According to Orthodox bioethics, human suffering plays a beneficial role by purging and purifying the passions, illuminating the Grace of God and fulfilling the vocation of participating in Christ's suffering. Medical achievements and technology must be subject to constant re-evaluation and judgment in the light of Biblical and Patristic theology. The duty of every Orthodox medical worker is to be the good and merciful Samaritan. His life must be a continuous path to scientific and spiritual perfection and a martyrdom of dying to self, living in Christ and serving constantly with love and devotion the suffering human being.

The new and impressive achievements in the expanding spectrum of biomedical sciences, together with the prodigious development of technology in recent years, raise crucial problems in the fields of the medical ethics, theology, sociology, law, and philosophy of sciences, which demand deep consideration.

From the Orthodox point of view the main criteria of medical ethics are basically spiritual.¹ Any scientific and biomedical achievement which is compatible with Orthodox theological teaching, tradition and experience, respecting the sacredness of the psychosomatic unity² of the human person and contributing to amelioration of the quality of life, is always regarded with respect and approval. The Orthodox Church sees healing from illness by medical professionals and by the on-going developments in the biotechnical sciences and medical research as a God-given art, contributing to the recovery of human health and of the restoration of the psychosomatic harmony and peace of the suffering person.

Orthodox medical ethics is always based on the spirit of the divine economy (οικονομία), and therefore remains unaffected by the ambitious plans of human progress, productivity and enhancement.

Human enhancement technology, in particular, poses many philosophical, theological, ethical and conceptual problems, since the motivation for enhancement is a factor of considerable ethical validity and decisive importance. Thus, if the motivation for enhancement is driven by dissatisfaction, or by the desire for self-improvement due to ambition or vanity, it may raise many questions in the field of medical ethics.

Orthodox patristic teaching emphasizes the role of conscience and the virtue of *diacrisis* (discernment) in making moral decisions.³ The critical ethical decisions that humans may be called upon to make should be made within the community of the Church.

For the doctor, the most important and essential decision, before making any further decisions, is to surrender himself into the merciful hand of God and His will.

According to Orthodox biblical and patristic anthropology,⁴ life is the supreme gift freely bestowed by the God of love, who is the creator and sustainer of life and the source of real healing.⁵ Humans were created immortal by grace. Biological life is simply a stage in the entire destiny of the human being. The Orthodox Church confesses, on the basis of Divine Revelation, faith in the bodily resurrection of the dead.⁶

All humans are made in God's image,⁷ but to be in His likeness is granted only to those who through great love and faith in the Lord have brought their own freedom into absolute subjection to God. Fallen human nature must be restored to its original glory, a glory derived from its creation in the image of God.⁸ Metropolitan of Nafpaktos Hierotheos says that part of the natural state of the divine image in humankind is an intricate connection between soul, mind, and body. "Since the soul is all through the body, both the whole man and the body itself can be regarded as in the image of God." St. Maximus the Confessor understood intellect as an attribute of the image of God in humans. "Naturally endowed with the holiness of the Divine Image, the intelligence urges the soul to conform itself by its own free choice to the divine likeness."⁹

Without spiritual life, man's earthly life lacks its meaning.¹⁰ God has chosen us for life of which the ultimate end is participation in the light of the eternal glory of the Risen Christ.¹¹

The transcendent destiny or *telos* (τέλος) of human existence is *theosis* (θέωσις) or deification by grace of God, since the primal vocation of humans is to 'ascend to the house of our Lord' where they shall enjoy eternal communion with the Holy Trinity.¹² The goal for the Christian is union with God in love.¹³

Therefore human life finds its ultimate fulfilment beyond death, in the eternal boundless communion of 'righteousness, peace, and joy in the Holy Spirit' that constitutes the Kingdom of God.¹⁴

According to the Orthodox anthropology the human body is a temple of the Holy Spirit, where God is glorified.¹⁵

Quality of life is based principally on the sanctity of life. Every human being possesses the capacity and ability for virtue, holiness and ultimately theosis or deification by the grace of God.¹⁶ Acquisition of sanctity requires the *methexis* (μέθεξις) or cooperation of humans with divine grace that involves 'rejecting the old Adam and incorporating the new.'¹⁷ Christian life means new life, new creation in Christ.

Attainment of the virtues of goodness, love, mercy and justice requires the discipline (spiritual askesis) of continued repentance and total purification of life, the heart, the mind, and the soul. Askesis is an exercise for impassibility (ἀπάθεια), a gymnasium of the intellect, training for contemplation of spiritual values, an internal way to perfection involving a scale of essential virtues beginning with faith. This means that the acquisition of sanctity is a continuous methexis (participation) in the cross of Christ and His holy resurrection. The cross of Christ essentially means total existential liberation and regeneration of humans, freedom from anxiety, depression, ambiguity, frustration, earthly ambition, disappointment, meaninglessness, spiritual stagnation (ακηδία), passions, corruption, sin, and death. The cross of Christ means deep interior harmony and peace of the soul. It means real life.

Humans are truly 'persons'¹⁸ only insofar as they reflect the ultimate personhood of God, which is characterized by a total mutuality of love shared among Father, Son and Holy Spirit. Christos Yannaras states in *The Freedom of Morality* that the person is the hypostasis of the human essence or nature. He sums up in his existence the universality of human nature, but at the same time surpasses it, because his mode of existence is freedom and distinctiveness. In present modern societies, feeling like 'a non-person' is a rather common psychological phenomenon, probably due to increased individualization and social conflict.¹⁹ According to Bishop Ware, a 'person' is not the same as an 'individual'. As isolated, self-dependent beings, none of us is an authentic person but merely an individual – a bare unit as recorded in the census. Egocentricity and personal ambition dispatch the true personhood. Each human being becomes a real person only through entering into relation with other persons, through living for them and in them for the love and glory of God.

In Orthodox thinking, this infinite value of human personhood is the essential and principal guideline for all medical and bioethical decisions.²⁰

Suffering is a crucial condition of human life, evoking moral, theological, philosophical and metaphysical reflections, which from the bioethical point of view concern the ethos of living with suffering. Suffering, as a condition, represents a dimension of personal distress that goes far beyond physical or even psychological and emotional pain,²¹ including or inducing existential and social disharmony.²²

According to Orthodox bioethics, physical or psychological suffering plays a beneficial role having basically the effect of purging and purifying the passions, illuminating the Grace of God and fulfilling the vocation of participating in Christ's suffering.

Suffering, therefore, offers the possibility of sharing in the life of the crucified and risen Lord. The suffering person takes up his cross with happiness and willingly follows the Lord to his own passion. He takes 'the marks of Lord Jesus' in his body²³ "always bearing about the dying of the Lord Jesus"²⁴

In addition, suffering makes the human being aware of his total dependence on the inexhaustible love and mercy of God. Physical or mental pain and suffering must be surrendered with gratitude into the loving and merciful hands of God. The acceptance of suffering patiently, peacefully and thankfully, brings humans to repentance and delivers them from death.²⁵ Physical pain can reconcile humans with God, "the life also of Jesus might be made manifest in our mortal flesh."²⁶

According to the Orthodox Christian moral values, the person must participate in the suffering and pain of every human being so that personal feeling has universal dimensions.²⁷ According to Saint Ignatius of Antioch there is no meeting more meaningful than that which takes place in the sharing of suffering.²⁸ Communion with suffering people is a communion of real existential love, compassion and mercy.²⁹

According to Orthodox medical ethics the physician, who is created in love, as is every person, is called to respect and honour the mystery of God, participating always in the pain of the human being.³⁰ He or she must seek to be absolutely beneficial in alleviating the physical and psychological distress of suffering people and healing patients in accordance with the highest scientific possibilities and standards through *koinonia* (κοινωνία), i.e. continuous communication with the Church.³¹

The supposed split between science and religion is often discussed at length. In reality there is no such split if science and scientific research are performed for the glory of God. As Archbishop Luk underlined "Religion is the sun in the sky of science"³². Scientific work can be interpreted as 'para-eucharistic' work (John Zizioulas). The most important and urgent problems in the science-religion dialogue in our era are mostly ecological and bioethical.

The achievements of the ongoing scientific research and biomedical technology including enhancement would be regarded with much respect and approval if they would be beneficial for the physical, mental and spiritual harmony of the human being for the glory of God and the sanctification of the life.

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- ¹ In contrast, secular bioethics tries to avoid religious divisions, assigning universal claims. See Engelhardt HT Jr., *Bioethics and Secular Humanism: the Search for a Common Morality*, Philadelphia: Trinity Press International, 1991. Orthodox bioethics, on the other hand, is exclusively based on the principles and values of Christianity under an ecclesiastical consciousness, involving at the same time the personal conscience of each human.
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- ³ Diacrisis is a spiritual gift through which one discerns the inner states, it is a gift which pertains to the pure nous. St. John Cassian (*Philokalia I*) writes: "Discrimination [discernment] is no small virtue, but one of the most important gifts of the Holy Spirit ... [it is] ... nothing worldly or insignificant. It is the greatest gift of God's graces ... the ability to discriminate between spirits that enter into him and to assess them accurately."
- ⁴ Orthodox anthropology is essentially Trinitarian; the human person is destined for communion with the three persons of the Holy Trinity. See also Phillip LeMasters, "The Practice of Medicine as Theosis," in: *Theology Today*, 61, 2004, pp. 173-186.
- ⁵ St Gregory of Nyssa writes that creation was brought into being by the Divine Will, not through any necessity to create but rather because of a superabundance of love. *Gregory of Nyssa, Select writings and letters of Gregory, Bishop of Nyssa*, ed. Phillip Schaff and Henry Wace, trans. William Moore and Henry Wilson, vol. 5, *A select library of Nicene and Post-Nicene Fathers of the Christian Church (Second Series)*. Michigan: W.M.B. Eerdmans Publishing Company, 1979.
- ⁶ Is. 26:19; Rom. 8:11; 1 Cor. 15:42-44, 52-54; Phil. 3:21
- ⁷ *Orthodox Psychotherapy: the Science of the Fathers*, trans. Esther Williams, Leviaia-Hellas: Birth of the Theotokos Monastery, 2002, p. 118.
- ⁸ *Philokalia II*.
- ⁹ Maximus Confessor Migne Patrologia Graeca, Vol.90.
- ¹⁰ See also Stavros Baloyannis S, *A Way through Psychology*, Thessaloniki: Pournaras Publ., 1982.
- ¹¹ "It is the divine light which perfects the human spirit, conferring likeness upon it through love," in: Lossky V., *The Vision of God*, Bedfordshire: The Faith Press, 1973. "He who participates in divine energy becomes in some way light in himself; He is united to light and with the light he beholds with all his faculties all that remains hidden to those who do not have this grace," in: Gregory Palamas, Hom. *On the Presentation of the Virgin in the Temple*, Ed. Sophocles, p. 176.
- ¹² St. Gregory of Nanzianzus (328-390) spoke of the contemplation of the trinity PG 37, cols. 1165-7
- ¹³ "Love actually unites the soul to powers of God as it seeks by the inward sense the One who is invisible," in: *Diadochus of Photice. Spiritual Works*, Sources Chrétiennes 5a, p. 85.
- ¹⁴ Romans 14,17.
- ¹⁵ "Glorify God in your body" (1Cor 6:20). Kallistos Ware says, "When a man knows or participates in the divine energies, he truly knows or participates in God himself, so far as this is possible for a created being," in: *The Orthodox Way*, Rev. edn. Crestwood: St Vladimir's Press, 2001, pp. 124-126.
- ¹⁶ According to St. Cyril of Alexandria theosis or deification is the supreme goal of the created human being. For St Maximus deification, the supreme end of the human will determines all the rest.
- ¹⁷ "It is no longer I who live, but Christ who lives in me," (Gal.2:20).
- ¹⁸ See also Rosalie Hudson, "Dementia and Personhood: a Living Death or Alive in God?" in: *The Australian and New Zealand Theological Review: Colloquium 36*, no. 2 (2004), p. 128. See also Le Masters, "The practice of medicine as theosis," p. 179: "All human beings bear the image of God and all are persons in the Christian. Sense, because all are created and redeemed for communion with the Persons who are the Holy Trinity."

- ¹⁹ See also Hierotheos, Metropolitan of Nafpaktos, *The person in the Orthodox Tradition*, translated by Esther Williams, Levadia-Hellas: Birth of the Theotokos Monastery, 2002.
- ²⁰ The man has the potential, by the grace of God, to be perfected in his personhood. 'Through Christ, with Christ' (1 Thess 4:14) and in Christ (1 Cor 15:22).
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- ²² See also Stavros Baloyannis, "The Philosophy of Dementia," in: *Encephalos*, 47, 2010, pp. 109-130.
- ²³ Gal. 6, 17.
- ²⁴ II Corinth. 4,10.
- ²⁵ Mark the Hermit, *Philokalia Vol.1*, pp. 136, 139.
- ²⁶ II Corinth. 4, 11.
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- ³² See also St. Luke Metropolitan of Sympheropol, *On Science and Religion*.

Chapter 9

AN ISLAMIC VIEWPOINT ON THE 'PERFECTIBILITY' OF THE HUMAN BEING

by Omar Van den Broeck

AN ISLAMIC VIEWPOINT ON THE 'PERFECTIBILITY' OF THE HUMAN BEING

by **Omar Van den Broeck**

I should like to start by referring to a work that I am preparing for publication entitled *Sufism or the return of religion: a reflective stroll in search of the 'lost centre'. Western and Koranic readings: semiology and Islam in dialogue*. The 'lost centre' symbolises the human ego's search for identity. Among other things, I describe not only the importance of the new media but also the possibilities which they open up for gaining a better understanding of the constitution of this ego. Screens of all sorts, from televisions to computers and smartphones, provide enlarged mirror images on the basis of which we have learned since our infancy to work out who we are and how we can and should find our place in our environment. Since I am not an expert in the exact sciences, in biology or in information technology, I shall limit myself to indicating some of the main lines (historical and anthropological) of the Islamic point of view.

The interreligious and interdisciplinary dialogue should enable cross-fertilisation of ideas across confessional and scientific frontiers. Contact between representatives of different confessions today is easier than would be the case if, miraculously, I found myself speaking with a fellow-Muslim from the Middle Ages, or, I suppose, if a Catholic found him- or herself in the presence of Thomas Aquinas, or a doctor with Avicenna.

Allow me, in this context, to return to what many regard as the cradle of European civilisation, namely Greek philosophy. I refer more particularly to its beginnings with the *Panta rei* of Heraclitus: "The waters of a river, in their perpetual flow, never remain the same." The same goes for religious communities: they also are caught up in a flow. Our modern screens witness to this speeding up. It remains true, however, that, amid this accumulation of variables, religions offer certain constants. For the Semitic religions, for example, there are the Mosaic Ten Commandments.

The Greeks were not the last link in the chain leading to Western epistemology; the latter also has an Islamic inheritance. It is true that Plato and Aristotle are very important for thought and methodology, but the Islamic tradition (in close osmosis with the Jewish tradition – see Maimonides) added some other very important elements which were

taken up in the West. I would name two examples here. First: in the Islamic tradition we see the importance of working in teams. It is well known that al-Azhar founded in Cairo in 988, was the first university in the world; moreover it also had a university hospital. This brings us right up to date because current progress in medicine is the result of networking between hospitals and universities. Secondly, there is a tradition of 'devising practical solutions': for reasons that were in part religious, Muslims got involved in research, for example, the compass was developed in order to determine the obligatory direction for prayer. This work also enabled Muslims to calculate the circumference of the earth, which led Christopher Columbus (who had misunderstood these calculations) to believe that when he met the indigenous people of the Caribbean he had reached the Indies. There was also the development of the clock, both ordinary and astronomical, to calculate the hour of prayer. So we can see that the prime mover in devising these 'practical solutions' were the imperatives of religion.

Thus there is a similarity between the components of Western and Muslim epistemologies. The great difference between the two is the 'compartmentalisation' of Western epistemology, meaning that the field of religion became separated from the field of ethics. At the Renaissance, God was 'sent back to heaven.'

Modern scientists do, however, recognise this problem. An astrophysicist such as Reeves never tires of saying that technological progress is one thing, but that the use we make of it is another; we invent things for our happiness, but also for our misfortune. Nuclear energy is one of the best examples, and not only Hiroshima but also Fukushima. Moreover we see the development of new myths which echo to some extent the eschatological messages of the Semitic texts: the myth of infinitely perfectible civilisations (Michio Kaku), as well as myths of humanity's self-destruction.

But can the ethical dimension function in a closed circuit? For religious people the answer is 'no.' Ethics are linked to religion, and thus to a global concept of humanity. Some will argue that human beings must continually seek to perfect their condition, to perfect their happiness here on earth. But religious people generally affirm that humanity was created first and foremost to worship God, created, that is, in relation to a Beyond. This is a question of viewpoint: who is at the centre, humanity or God? Religions affirm that the answer is God. In his contribution elsewhere in this volume, Rabbi Guigui refers to the tower of Babel. When ambition is merely human, it proceeds from hubris, the folly of unlimited ambition. This has no time for ethics: the brick to build the tower becomes more important than human life. For people of religion, the desire to attain to God has no sense except through love and self-denial.

Religions hope that modern ambition will not reject the first two commandments. Which brings us to the starting-point of Semitic religion: to love God and to love our neighbours as ourselves. This is indeed the message of the religious communities to the scientific ambitions of modern humanity.

Chapter 10

REFLECTIONS ON TEN YEARS OF HUMAN ENHANCEMENT DEBATE

by Donald Bruce

REFLECTIONS ON TEN YEARS OF HUMAN ENHANCEMENT DEBATE

by **Donald Bruce**

This chapter is a personal reflection drawn from involvement with human enhancement issues for ten years. While the potential for radical enhancement is much exaggerated, emerging technologies and even some existing cognitive drugs pose important questions about how far we should seek to enhance the human body non-medically beyond its current limitations. After clarifying what is meant by enhancement, the paper offers a theological approach based on humans made in God's image, which stresses a relational rather than a functional view of the human person. Whilst God-given human capacities of creativity and invention promote intervention in nature, these do not readily translate into a theological mandate to modify the human body. This does not mean 'no never,' but enhancements do not stand up well if we consider from a Christian ethical perspective wider aspects of the human person beyond mere improved performance. Six factors are identified and examined against which to assess enhancements, including personal benefit, risk, the difficulty of validation, charlatans, social injustice, and distorting the dynamic equilibria of the body. Social issues of equity and fairness could pose especial problems. Examples of useful enhancements in limited contexts are identified, but it is not clear how far more general internal enhancements would actually enhance people's lives in practice. The chapter concludes by suggesting that physical human enhancement misses the point because it could never address our deepest spiritual and moral needs, nor the majority of the major issues facing humanity. Is human enhancement not wrong as such, but a distraction from the ultimate issues of being human?

10.1. Introduction

This chapter is a personal reflection after some ten years of engagement with the question of human enhancement in several capacities. It draws upon work for the Church of Scotland Society Religion and Technology Project, as rapporteur for the CEC Bioethics working group study on human enhancement,¹ and in the EC framework research projects NanoBio-Raise,² and ETHENTECH,³ which included religious views of the issue.

All too often this field has been marred by a great deal of exaggeration of the technical potential, by a tendency for advocacy to over-influence discussion. The academic debate has focused on imagining philosophically interesting 'what-if' ethical questions about technologies whose feasibility is often viewed far too uncritically. Nordmann, who acted

as rapporteur for the European Commission's expert study in 2003,⁴ has since warned that the speculations of a few should not be allowed to distort the picture to focus on issues that are hypothetical and miss more immediate and substantial questions.⁵ Nonetheless, with a series of studies over these ten years human enhancement is on the scientific and ethical agenda, which raises a complex set of far-reaching issues.⁶

10.1.1. Setting the Scene

Several aspects of human enhancement were illustrated in an early debate on the subject at the Royal Institution, London in 2002 on "The Search for Perfection". My fellow speakers were the eminent liberal ethicist John Harris, Kathy Phillips, beauty editor of Vogue magazine, and sociologist and disability advocate Tom Shakespeare. The latter has inherited the genetic condition achondroplasia, in which adult height remains less than 1.5 metres. Shakespeare observed ironically that, according to Harris's advocacy of pre-implantation embryonic selection (PGD) to eliminate unwanted genetic defects, he should never have existed, if his parents had PGD available for his condition. This represents the idea of enhancement by eliminating what is sub-standard to our specifications. Meanwhile, Phillips' surprising statistics for how much cosmetic surgery is used, even among men, indicated how far some people are prepared to go in search of a better physical appearance than the one their creator had given them – enhancement by altering the body.

My contribution explored the appeal of enhancement for success in competition and personal achievement. I had been a promising young athlete. I had a brilliant rival, who would go on to become the 10,000 metres world record holder. Just once, I almost beat him. As a science student I wasn't prepared to train as hard as he did. But suppose I had had some chemical drug to give me those extra two yards? Such a shortcut would not reflect my true ability, and my satisfaction would be hollow. It would also have been against the rules of the sport. Are there ethical limits for the wider human 'race' setting constraints on enhancing performance? Or is just a competitive free-for-all? In seeking to improve the human condition what are we striving for? Is the physical desire a surrogate for something which is ultimately spiritual? What does it say about the human condition and its imperfections that the perfect human from a Christian perspective, Jesus Christ, was described as 'a man of sorrows' and 'made perfect through suffering'?⁷ This irony has continued to shape my thinking as I have reflected in the intervening 10 years.

In 2006, an international conference in Oxford under the title of Tomorrow's People brought many of these issues to a focus.⁸ At times the meeting had the flavour of a religious convention in advocacy of transhumanism. Devotees of transhumanism presented enhancement as the future of a new humanity, no longer constrained by our biological limitations, with the chance to take evolution into our own hands. Most ideas

were far-fetched and few scientific researchers subscribed to the hype and radical ideas of transhumanists.

Yet there was sufficient evidence that some physical enhancements might be possible, and that research borderlines are fuzzy and largely unregulated. A sophisticated scientific tool developed for medicine could be adapted to alter and enhance 'normal' human functions, with little, if any, public scrutiny. Moreover, even though many of the technological claims were improbable, the capacity to mislead people into believing them posed a significant concern. In an era which holds an almost magical popular view of the power of science to do anything we want, waiting only for the right technical incantation to be devised, false claims can be made all too easily.

10.1.2. The CEC Working Group Study on Human Enhancement

The CEC bioethics working group mandate was to examine emerging issues in bioethics. Human enhancement clearly posed underlying theological questions about the human person, and ethical issues about both its ethos and its outcomes. We considered it timely to begin considering the subject, to stimulate the churches into thinking 'ahead of the game' and as part of our on-going interactions with the relevant European institutions. The group drew in its membership on a range of disciplines including biotechnology, genetics, medicine, bioethics and theology, from different Protestant and Orthodox Church traditions, and from a variety of European countries. Given the preliminary nature of our study and the scarcity of real technical application, it was primarily a paper for discussion, not a position paper with firm conclusions. Its focus was not primarily the arena of academic theology, but to bring the issues to the attention of the churches, and to bring our Christian insights into the deliberations of the EC European Group on Ethics (EGE) and the Council of Europe's bioethics committee (CDBI), with whom the CEC group has been in dialogue for many years. In 2009 produced its discussion paper.⁹ At about the same time, the bioethics working group of the Catholic Bishops Conferences, COMECE, produced a similar short paper.¹⁰

In earlier studies examining issues like patenting, genetically modified crops, genetic selection and cloning, the CEC Bioethics working group had argued that our humanity should not be redefined by a techno-logic, driven by economics or technical feasibility, or by humanist world views of radical academics in influential positions.¹¹ At this point in time, the challenge of human enhancement lay as much in the understanding of the human person which underlies the technological project as in the technologies themselves, which remained largely speculative. The case made for human enhancement by its advocates often contained a world view perspective which took for granted certain assumptions about the nature of our humanity and our human capacities. We felt it was

our role towards the churches and wider European society to bring these assumptions to light and, where necessary, challenge what we considered to be a narrow functionalist view of the human condition, measured by performance, in which human value is not in our being but in our abilities. The possibility of having the technological tools to alter the human person itself (enhancement) also prompted us to reflect afresh upon what our human goal is, and to consider what sort of societies we should want to live in.

The following discussion draws considerably on the work of the CEC group, for which I was rapporteur, but is my personal reflection.

10.2. What is Human Enhancement?

10.2.1. Some Distinctions

The first question in addressing human enhancement is the difficulty of deciding what it means, what is encompassed by the idea, and what is not. This is further complicated by the discovery that the term in English does not always transpose readily into some other European languages, which have slightly different concepts in mind. At its core, it is the concept of an aspiration to use technology, to make functional changes to human characteristics, abilities, emotions and capacities, beyond our current physical limitations, using advances in bio-, nano- and information technology and the mind sciences. A strict definition is hard to make, covering such a wide field of application, but a number of distinctions can help to clarify the sense of what is meant by enhancement.

The first distinction is between technology outside the body and direct interventions in the body itself. It is true that humans have always sought to enhance the human condition through agriculture, nutrition, energy, engineering, mobility, education and so on. But in the narrower sense of enhancement which is being considered here, there are substantial differences. A computer is an external tool which I can put down and switch off. My daily use of it has certainly changed my brain, but it is still not part of my body. An implanted chip linking my brain to a computer would become literally a part of my body, and could not be removed without surgery.

The CEC study focused not on external tools, but on the aspiration and attempt to make enhancing modifications in the human body itself, something that is literally incorporated.

A second distinction is between such a chip which is presumed to be permanent in its effect, and taking a chemical whose effects are transient. The enhancement would last only until the active molecules are used up or metabolised or decompose. A person could only keep the level of concentration enabled by a drug like Ritalin, or the wakefulness

given by Modafinil for as long as the dose lasts. They would then revert to their normal ability and need for sleep. To maintain the 'enhancement', one has to keep taking the chemical.¹²

A third distinction is more controversial: between medical intervention and enhancement. This distinction is much challenged in academic philosophical discourse. The idea of what is normal or and what are medical conditions are argued to be too insubstantially based to be valid, or no more than variable human constructs.¹³ However, the proposal of human enhancement is meaningless without some concept of normalcy as a base from which enhancements are supposed to 'improve'. Quite often enhancement is called 'biomedical enhancement', which is a misleading term, in giving a false moral aura by association of the word 'medical' to interventions which have been declared to be merely biological improvements.

Our public engagement findings in the ETHENTECH project showed a striking contrast to this academic rationale.¹⁴ Using the Democs card game on Human Enhancement, developed especially in the context of this project, people were asked to consider eight real or potential applications of human enhancement. Members of the public seemed to show little difficulty in seeing a valid distinction between interventions which restore and those which enhance. In their reasoning, many people seemed to have a tacit sense of a 'norm' for a given human capacity. A technology was assessed as either bringing someone from below the norm towards or up to it, or taking someone away from or beyond the norm. Support was expressed for brain electrical stimulation for medical conditions, cosmetic surgery for disfigurements from an accident or of genetic origin, enhanced sight for the poorly sighted, and interactive implants for the elderly or disabled. However, their corresponding uses that would go beyond the norm were much less favoured, or sometimes even objected to, except in some quite specific situations.

In the first instance, it seems common sense to distinguish between interventions in the body made for medical reasons, including anticipative action like prophylactic medicine and vaccination, and interventions made unrelated to medical treatment or disease prevention. The CEC study decided to examine primarily the more challenging question of enhancements that would go far beyond a medical context. There are indeed situations where the distinction blurs, but this does not invalidate the distinction. As philosopher Soren Holm points out, the existence of 'grey areas' does not invalidate this distinction any more than yellow and red are rendered invalid as colours because they can merge into orange.¹⁵

Lastly, it may be helpful to distinguish between three different degrees to which I might think of being enhanced, in terms of the goal I am aiming at:

- i) having my natural ability to do something enhanced, but still within the range of normal current human ability, to run a bit faster, to be a bit quicker in my mental capacity, or whatever.
- ii) having my ability enhanced beyond what is currently possible for any human – to run a mile in three minutes, to have superhuman memory;
- iii) having an ability which the human species cannot do at all, like see in the infrared region, or have telephoto vision.

When they think about enhancement, most people probably think more in terms of the first of these three degrees, which is at least more likely to be achieved. The other two beg the question of feasibility, but for some, notably transhumanists, these are indeed the goals we should be striving for.

10.2.2. Some Basic Questions

From these distinctions it is clear that the term human enhancement is not one single or simple concept, but covers a wide variety not only of potential technical applications, but ideas about what one is seeking to enhance, and in what sense. The discussion assumes that our human capacities and capabilities might be elevated to some more enhanced level, through technically manipulating the human body or brain. To what extent this is feasible has been seriously questioned, but if some degree of enhancement were possible it raises several basic questions.

- should we consider human enhancement to be ethically permissible or impermissible?
- is any particular state achieved by enhancement better than the natural baseline upon which it is claimed to improve?
- should it only be considered better, provided certain conditions are achieved, and if so what are the criteria for assessment, which criteria should have the most ethical weight?
- could human enhancements be individually better, but socially undesirable?

The answer to these questions depends crucially on one's belief about what a human being is, and thus on one's underlying worldview. Much of the drive for human enhancement so far has assumed a naturalistic view of reality, and thus of humans, and is often expressed in a liberal perspective on ethics. At times, the enhancement debate seems more about whether there are moral limits to human activities, and defending the right to be enhanced, than about enhancement *per se*.¹⁶ Advocates of enhancement have sometimes framed it as a debate between 'progressives' ('goodies', who want to press ahead) and 'bioconservatives' ('baddies', who are standing in the way). Erik Parens, whose early study of enhancement remains an important landmark,¹⁷ expresses it less pejoratively as a difference between those who see human life primarily as a gift to be accepted with

gratitude, and those who see it as something inherently manipulable.¹⁸ But he then notes that one may hold both ideas of gift and creativity, citing the biblical example of Jacob in the book of Genesis. Jacob protests 'Am I in the place of God?' when Rachel complains that he has given her no children, yet in the same chapter he also genetically manipulates animal livestock.¹⁹ Reflecting on the understanding of humanity within a Christian worldview, I also find both aspects of gift and creativity. From the perspective of its particular understanding of humanity, a Christian view of human enhancement does not sit comfortably within the polarised framing of progressive or conservative. It seems to come at it from a different angle, as I shall now explore further.

10.3. Theological Perspectives

10.3.1. A View of the Human Being in God's image

I start where the CEC study took as its starting point, one of the foundational concepts of Christian anthropology drawn from the creation narrative myths in the early chapters of Genesis, namely that human beings are created 'in the image of God'. The meaning of God's image has been much debated over the centuries, in many different interpretations and theological traditions. But some key points may be offered.

Evolutionary history is not merely a random set of events, but is the unfolding of the creation of the personal and infinite God, of which humans are, according to the Genesis accounts, the final form. Humans are unique beings with moral free will, consciousness and capacities that reflect those which God possesses, and whom God has set to rule over and transform the rest of God's creation. This anthropology is important because God both gives the characteristics of the human condition, but also sets limits for it.

In reflecting God's unity, the human being is an indivisible unity of body, mind and spirit. We are not eternal spirits inside corruptible temporal bodies, nor merely embodied minds. We are a fusion of all three. While the importance of the body should be affirmed, our humanity is not to be defined merely by how well or badly our bodies or minds function. Because we are first and foremost created and loved by God, every human being is of unique value, regardless of our capacities or lack of them, our perfections or imperfections, our abilities or disabilities. In God's economy each one has a uniquely valuable role to play, whatever their situation. God is not more interested in 'superman', but with 'everyman' and with the unique response each human being can make.

Humans are also profoundly relational, reflecting the relationality of God. As Father, Son and Holy Spirit are in constant eternal communion, humans are made for relationship, with God, each other and with the created order in which God has located them. This

is especially important in opposition to the tendency of personal human enhancement towards a self-referential individualism, or to a competitive urge to 'go one better' than my rivals, before they do so over me.

In relation to technology, one aspect of bearing God's image is in seeking to understand the natural world and in the creative, imaginative and inventive ways we work in it, transform it, but also care for it and protect it, and offering what we have done back to God as part of both our worship and our accountability. In one sense the image of God is like mirroring God, from whom those creative capacities all originate and derive. In another sense the image represents God to the rest of creation in acting on God's behalf, as vice-regents appointed by God over the rest of the earthly creation. Expressed within our relationality, this is to be done in the constraints of three harmonious relationships – with God, with fellow humans and with the rest of nature.

10.3.2. Spoilt and Redeemed Human Nature

Integral to this anthropology is also the vitally important insight that Image of God is a spoilt one. Humans are no longer as God intended them to be, falling into moral and spiritual corruption by disobeying and seeking independence from God. This results in a separation from God, a disruption in human nature, strife with our fellow humans, and conflict with nature. Thus humans are capable not only of wonderfully noble and creative acts, but also horrible and destructive ones. Even our best efforts, including in science and technology, are to some degree spoiled by this aspect of our human nature.

Christians also believe that God has intervened to redeem our situation in the historical person of Jesus Christ, coming as God in human form. Through his life, death and resurrection, humans may be restored to relationship with God, recovering somewhat the image which God intended for humans, and rebuilding the relationships he made us to enjoy. This restoration is only very imperfectly expressed in this life in the community of Christian people. For its fulfilment it awaits the bodily resurrection after death, in which humans are finally perfected in eternal life in Christ.

10.3.3. Human Capacities in the Light of God's Image

Our desire to know, to create and to intervene is God-given. Science and technology are therefore not alien activities but expressions of the image of God, to deepen our understanding of God's creation, to glorify God by using that knowledge to promote the flourishing of creation and of people. Technology expresses something of God's mandate to humanity to explore the fulfilment of the potential God put in creation, to work the 'garden' of creation and care for it, to love our neighbour. It is now also to help heal the

damage of human fallenness, to restore the rule (kingdom) of God. It should seek to redress in part the results of sin and evil, and look out especially for the needs of the poor and powerless. It should do all in the light of eternity: death, resurrection, final restoration and a final justice.

Yet, despite all our creativity, we remain creatures. These capacities are God-given, not self-generated. We remain finite and dependent, not omniscient, omnipotent or autonomous. There is thus a tension in our nature. On the one hand, to be human is to want to exceed what we are. On the other, to be human is also about what we do with what we have. The aim of seeking to enhance our capacities is inherently vulnerable to the possibility of its failure. As a concept, enhancement takes insufficient account of the role of suffering and mortality as part of the human condition, which technology or medicine may ameliorate but will never eradicate. We will all eventually die of something.

There is a second tension in our nature which is, as already observed, that the image of God in humans is also spoiled, which spoils what we do with our creativity and talents. There is thus a dissatisfaction in the human condition, because we are not what God intended us to be. We are not at ease, but long to be something better. In our best moments, we may glimpse it but in our failings we know how far short we are. What is wrong with the human condition is not a lack of strength, longevity, intelligence, beauty, athleticism, art, science or even education. It lies in the moral and spiritual shortcomings of humanity, individually and collectively, as the world's on-going conflicts show. Our deepest problems are less in any physical limitations we may have, than in our moral, relational or spiritual failings. This looks not for enhancement but transformation, of a very different kind from enhancing physical or mental functional abilities.

10.3.4. Transhumanism and Christian Anthropology

Transhumanism is a loosely defined movement whose common thread is the promotion of the idea of enhancing humans beyond our present biological limits term, through emerging technologies. Many of its proponents consider it to be an inevitable reality, which will in due course produce a post- or trans-human significantly different from the present version of humanity. One of its leading philosophers Nick Bostrom writes that "Transhumanists view human nature as a work-in-progress, a half-baked beginning that we can learn to remold in desirable ways. Current humanity need not be the endpoint of evolution".²⁰ Wired magazine in September 2012 reviewed its more popular self-presentation.²¹ Wikipedia has a detailed and extensive entry for transhumanism, its supporters and critics with numerous references for further reading.²²

The quasi-religious nature of transhumanism has been noted by many commentators.²³

To me it is a misplaced world view, which revives old distortions of Christian belief in a 21st century guise. The transhumanist dream interprets present reality through the teleology of its vision of future humanity, as one of inevitable progress. The Christian gospel interprets the present through the centrality of the death and resurrection of Christ in history and its eschatological fulfilment by God's action, not in technological progress. In its claims for transcendence of the human by technology, transhumanism recalls the Tower of Babel myth, in which people sought to make a name for themselves by building in this way.²⁴ Those who believe in perpetual life extension recall the idea of 'eating the tree of life' illicitly, in order to live for ever by simply not dying.²⁵ These are very different from the eternal life in Christ, expressed in John's gospel and letters, and from the acknowledgement of the supremacy of 'the name above every name' of Jesus Christ.²⁶

Transhumanism rightly identifies a desire of human beings to better themselves, and our dissatisfaction of our present condition. With such insights one can agree, but not in their cause or their solution. It is not a lack of physical or mental capacity that is our problem, because we have more serious and deep seated wrong at the very heart of all people. As long as that remains, all technological 'progress' has an inbuilt tendency to retrogression, because humans spoil it in pride and *hubris*, mistakes and misjudgements, greed, exploitation and oppression of others. From a Christian perspective it proposes the wrong solutions as to what needs enhancing because it makes an incorrect diagnosis about what is wrong with human beings, and why we are dissatisfied. The goal of human life is not to make humans ever better by technical means, because the same moral and spiritual problem would remain.

From the view of Christian anthropology, inherent human failings would remain no matter how much we enhanced ourselves. They lie beyond technical fixes, but require solutions of a different sort entirely. This is seen in Jesus Christ in whom the image of God is seen in its fullest light, as God made human. His death gets to the root issue, in addressing our fundamental spiritual and moral failure, and his resurrection begins to restore the life of relationship with God to which humans are called. The goal of a human life is then a transformation into the expression of the life of God in our lives, our human vocation is to follow and emulate the 'image' of Jesus Christ. This is expressed as the aspiration to become Christ-like, yet remaining ourselves – what is called theosis in the Orthodox tradition or sanctification in a Protestant theology. This is not achievable by any technological changes to the human body or mind, because this belongs to a different domain of human personhood.

Set against this understanding of Christian salvation and aspiration, the discourse about human physical enhancement is very interesting, but it rather misses the point. In so far as it seeks a kind of technological salvation without God, the transhumanist project is a false

hope which will not work, yet which has the potential to mislead people to what is in the end a false goal.

10.3.5. Human Enhancement in the Light of a Christian Understanding of Humanity

Although human enhancement is often associated with transhumanist ideas, it is a wider concept. If enhancement technologies are dissociated from the ideological framing of transhumanist goals, should we object to making more limited enhancements of the human body? If we do not look to become superhumans and if we duly recognise our human failings, would enhancements of body or mind reflect our God-given creativity and inventiveness, or go beyond what we should do?

The above theological reflection on the nature of human beings does not *a priori* produce a strong theological case that to enhance the human body or mind technologically would be inherently wrong before God, as a matter of principle. Christian understanding straddles Parens' two categories. The human body and mind are the gift of God, to be accepted with gratitude, but also have the potential to be something more. One aspect of this is in human use of technological skills to manipulate nature to human design as part of the expression of God's image. This is seen in God's mandate to humans to change nature: "fill the earth and subdue it".²⁷ The human 'condition' in its widest sense has been enhanced in countless ways, and extended the basic experience of human existence, while remaining within the same biological limits.

The creation mandate given to humans, as expressed in the Genesis stories, does not include a comparable mandate to seek to make major physical or mental upgrades to the human body and mind by direct intervention in it, should we ever be able to do so. But neither is it forbidden. It seems that the biblical context sets us a different focus. Several New Testament passages draw upon the image of the dedication and discipline of the athlete in training, or striving to reach the winning tape as a model for a Christian's life in spiritual and moral disciplines and on the eternal gold medal that awaits the believer. In his personal circumstances, Paul reflects that he has a different perspective on all the advantages he had of his upbringing and the efforts of his own personal religious zeal, and says these are 'rubbish' by comparison with the riches he has in knowing Jesus Christ, and in which he includes even his sufferings.²⁸ The body is important but not that important. The perspective is well summarised "While bodily training is of some value, godliness is of value in every way as it holds promise for the present life and also for the life to come."²⁹ "Though our outer nature is wasting away our inner nature is being renewed every day."³⁰ There is no clear mandate to enhance the body, as such.

It is a similar story in respect of the celebration of the gifts which God has given us, by using them in his service. Something of this is expressed in the script of the film *Chariots of Fire* where the Christian athlete Eric Liddell says “When I run, I feel God’s pleasure.” Liddell trained his body to the limit, and yet was prepared to lay aside the glory for God’s principles, if a conflict arose between them. The Christian context – that human life is lived primarily in relationship to God and to others – sets up a distinction between enhancement for our own independent exaltation, and our enhancement under God for the glory of God. Liddell was indeed exalted in becoming Olympic champion and world record holder, and his triumphs are celebrated to this day in the gymnasium and corridors of Edinburgh University where he studied. But he laid it aside and worked sacrificially as a missionary in China and died in the service of others.

None of this rules out human bodily enhancements, but neither does it provide a significant incentive for them. As observed above, to be human involves a tension between wanting to exceed what we are, and what we do with what we have. Bodily training to make the best of what we have seems to be somewhat different from taking a shortcut by ‘artificially’ enhancing the same capacities with an implant or adding a particular chemical to our metabolism. We welcome the convenience of an electric washing machine by comparison with hard human task of hand washing and mangling clothes, but the equivalent does not seem so valid within our bodies. The problem perhaps lies in the separation of mere functional effect or outcome from all that goes into creating, developing and honing a human ‘skill’. If the human body is no more than its functions, why not enhance anything we set our minds to? But if we are a more holistic and complex being, then separating mere performance seems to exalt human utility above human virtue, or the wider value of human worth before God, exactly as we are.

Another factor is the ‘opportunity cost’ of human enhancement. It would involve much energy, time, resources, gifts and money to develop. It might entail significant costs and preoccupation on my part in using them. From the point of view of Christian belief, would the potential represented by these gifts and resources be better spent in more important and pressing needs and opportunities, perhaps ones less focused on myself and more on the wider human situation? The diversity of human inventiveness and curiosity does not always require a ‘Grand Challenge of Greater Good’ to justify research or an endeavour like going to the Moon, or exploring the surface of Mars. But the question must be still asked: what is the real point of human enhancement, when we are faced with the combination of climate change, water and soil loss, food insecurity, disease, poverty, and a growing disparity in human wealth and health between have’s and have not’s? Set against these, the project of human enhancement might be something of a distraction of human skills and energy from more important issues. And if the main Christian focus of changing the human condition is in spiritual, moral and social aspects, which technology is not able to

change, the mandate for personal physical enhancement seems peripheral, at best.

The sum of these reflections is that a Christian perspective does not immediately say 'Don't' to the idea of human functional enhancement, but it does say 'Be very careful what you do!' This is not only in the more obvious risk and safety aspects but especially in why you do it. What will be its wider effects on you and your relationships? What unintended consequences would it have, and what wider social impacts, in so far as you can try to anticipate them? Having taken into account all these things together, judge whether the enhancement is indeed desirable.

10.4. Ethics of Human Enhancement: a Balance amongst Many Factors

And there are many reasons why the notion of human enhancement does indeed present significant problems when viewed from these wider perspectives, which we shall briefly explore. Our discussions within the CEC group highlighted a number of aspects which need to be taken into account in assessing something that is claimed to be a human enhancement. I have sought to summarise these as an idea of balancing different aspects represented by circles. Taking an idea from environmental ethics: just as sustainable development seeks to balance the three overlapping circles of economic, environmental and social, so also human enhancement should be treated as (perhaps) six circles representing different aspects which need to be considered in balance with one another.

10.4.1. Personal Benefit: What is a Human Enhancement, and Can We Know it?

At first sight the idea of enhancement is presumed to be self-evident. On reflection, how do we judge what improves a human being? In what sense and against what criteria is something deemed to be an enhancement? It is interesting that the English term 'enhancement' does not translate simply into other European languages, e.g. French, German, Danish. Indeed, can anyone claim to know, on a reliable basis, what would be better than the current design, other than as a purely personal judgement?

Suppose I had cosmetic surgery to 'improve' the appearance of my nose. Does my family, who spend more time looking at me than I do, agree that it has improved me, or did they prefer me and love me just the way I was? Human enhancement is ultimately self-referential. One might say that only an external observer would be in a position to say, one way or the other, whether a change was an enhancement or not. The supreme judge would be God, who designed human beings in the first place.

Thus, putting the same question in theological terms: do we know with enough certainty

how to improve on God's 'design' of ourselves, shaped dynamically through the ages of evolutionary processes? For many Christians the sense of giftedness of the human body sets limits constrained by wisdom. Humans with our finite and fallen nature should be very careful before they presume to make significant direct changes to God's wise design. If we can learn the understanding of the body and the skills to manipulate it, we can see what the human body is meant to be when functioning correctly. Medicine provides a strong incentive to set right, as far as may be possible, the things that go wrong with the body and mind as part of our fallen condition. To extend beyond the present biological limits is more diffuse in its aim. It may not be a forbidden exercise but it may or may not be wise.

10.4.2. Are there Limits to a Human Being?

This question was already explored in Section 10.3. Suffice to say, human beings are limited by mortality, finiteness, dependence on God and the physical parameters in which we may flourish. It is not my intention to speculate about highly unlikely radical changes to the human body. I would simply note that conceptually there would come some point beyond which one would say this is no longer a human being, just as a sheep-goat hybrid once produced by cell fusion in the 1980s' was neither sheep nor goat, but something different from either. I would take issue with Pico de Mirandola's Renaissance humanist speculation that human beings are the only one of God's creatures whose nature is not defined or limited. While there is open ended possibility to what humans may do and develop, we are not autonomous from God in anything we do. All is to be in relationship with God and this will set bounds on what coheres with God's laws and principles. God has put us in relationship with others and with the rest of the created order, and this will also set bounds to us. A frequent objection to the postulate of significant human life extension beyond 120 years is the unacceptable strain it would put on human societies and the environment. Being mortal is part of being human.³¹ It remains a supreme irony that the biblical picture of perfected humanity is Jesus Christ, who suffered and died and rose again to set humanity free from its suffering and death.

10.4.3. Balance within our Humanity

The theological perspective depicted in Section 10.3. above sees the human body as a unity of body, mind and spirit, which has many levels of description, each valid in their own context. This view of human beings is very critical of the narrowness of views which see humans and our capacities in a primarily functional, reductionist way. We need to assess an 'enhancement' by wider range of understanding than simply that it would be an improvement in some function of body or mind. From a Christian point of view, it should be viewed against an integrated and holistic understanding of the human person, rather than mechanistic concepts like performance.

Enhancement to improve human performance thus begs the serious question of what constitutes a true enhancement, in a wider concept of the human person. In the field of sport, the pursuit of excellence is applauded, but if it becomes taken out of proportion to the rest of the body, it can accentuate certain functions to such a degree that the body as a whole begins to suffer. For example, racing cyclists seem to tend to develop osteoporosis because of the extreme challenge to the lower body while the upper body remains relatively passive. The general phenomenon of over-accentuation in elite sports might provide a paradigm for the human condition as a whole. If we go too far in pursuit of one goal, other important things may begin to suffer.

Many so-called enhancements may not turn out to be enhancing, when looked at in a wider perspective of our humanity. This might be in a literal sense that the intended effect didn't achieve an enhancement. For example, having near infrared vision might enable me to drive more safely at night, but instead, I may use it to drive faster but not more safely. As I get older I might want to use some technology developed for Alzheimer's patients to recover lost memory, to enhance my normal memory function. But there are many things I am very glad that I do not remember very often, so how would I be sure I would only remember what I wanted?

Another important question is how we can know that the enhancement we are being offered will do 'what it says on the packet', and is guaranteed to enhance me. Given the lack of any regulation of this area, compared with the strict laws governing the use of medicines, how can we be protected against 'snake oil salesmen'? Jan Steen's 16th century painting 'The Quack Doctor' portrays how needy and suffering humans can become vulnerable to charlatans and is remarkably up to date. In cutting-edge regenerative medicine, unscrupulous people have launched unproven products and services, to make a quick profit from people's illnesses without proper regard for human risk or accountability.

God has set within humans the means to grow and develop. To short circuit this by chemical interventions or implants that could, say, create the experience of laughter without a joke would seem to miss the point about the breadth of human experience. In the same way claims about 'moral enhancement' are seen as an oxymoron which misunderstands the meaning of morality, mistaking effect for origin. Morality comes from the whole of our human learning, experience and choices. Our capacities to act morally may have chemical effects in the body, but are not determined by chemicals in the body, unless one takes a radically reductionist view of the body and asserts that morals are nothing more than chemical effects. One does not become any more moral by using additives to change one's level of certain chemicals. If I am now inclined to, or cannot help but, act in a certain way, because of the way the added chemicals work, then it is no longer truly my moral action, but something chemically induced in which I am no longer the free moral agent.

It is taken as axiomatic that an enhancement makes an improvement. But is this valid? An enhancement is a step of faith, because it is by no means clear that 'enhancements' do, necessarily, enhance. Would we believe we were enhanced because we had taken the step, but looking back later, would we agree that the enhancement had been genuine, or did it make little difference, or maybe made one thing better but something else worse? Even if some enhanced function did indeed work according to the intention and the claims, Christian theology asks are we better humans for being faster, stronger, longer lived more intelligent, with better memories, etc.? The specific function may perform in an improved way, but if considered more widely against our moral, social or spiritual nature, does that make us better persons?

10.4.4. Risk

There are serious risks in many aspects of intervention in the human body. In the case of implants there are risks of the procedure, of infection, of failure or rejection by the body and in the case of nano-scale particles or constructs there is a risk of migration to an unintended part of the body. Unless one simply wanted a transient effect occasionally, to obtain the primary benefit from a chemical enhancement requires long term or even permanent use of the chemical in one's body. Most pharmaceutical drugs have significant deleterious side effects, especially if used routinely over long periods. Chemically induced enhancements would be no less likely to suffer the same problem. There are risks that one's metabolism may not respond positively to the particular chemical. To imagine a situation without substantial risk would be fantasy. There are also risks from upsetting the overall balance of the human body and its systems. The genetic modification or intense selective breeding of food animals for increased growth rate has shown serious side effects from accentuating and stimulating one aspect too far, to the detriment of other aspects of the animal.

This question also focuses the question of a distinction between medical uses and non-medical enhancements. In medicine such risks as those listed above may be considered worthwhile taking under such circumstances as the hope of treating a terminal illness, or alleviating chronic distress, or significant impairment. The more serious the condition, the greater the risk that might be taken. In enhancements, there is no balancing good except the hope of some improvement in a capacity of the body, for which it is very much harder to justify taking the risks. It also raises serious questions about how testing and validation could be achieved without making human beings little more than experimental subjects. It is hard to see how something like clinical trials could be done, with any degree of validity, how one would reliably measure of benefit other than purely subjectively.

10.4.5. Social Issues

There are also social risks, common to many technologies, but for which human enhancement would give peculiar concerns. These include charlatans and spurious claims of efficacy, *hubris* and overclaiming on the part of scientists or promoters, the commercial, political or military pressures to proceed faster than we really understand, and the use of enhancement technologies for social manipulation. The history of the twentieth century suggests it would be unwise to assume that any of these concerns was now a thing of the past, which we have learned never to repeat. Indeed it would be naive to think so, on any Christian understanding of human fallenness.

As discussed above, a fundamental Christian understanding of humanity is that we are persons, designed to be in relationship, reflecting the image of the God who is in three persons, Father, Son and Holy Spirit. The Catholic study group report observes that enhancement must therefore be seen in relation to its impact on my neighbour, not merely for my own pleasure or interests in isolation. This led them and indeed many others to deep concern that enhancements would be inevitably highly socially divisive.³² Suppose, the technologies really were as highly beneficial to any human that had them as their more enthusiastic advocates claim. It would be monstrous if these were available only for the rich and privileged to enhance their existing advantages still further, and were not made available to all, equally, from the outset.

The concept of human enhancement tends to be presented individualistically and with rather naive views about how the society will benefit. Some point out that there are always new winners and losers from any new technology and that the best advantages eventually 'trickle down' to become affordable by all. But by the time a few benefits had tricked down, the rich 'early adopters' would have moved on to the next enhancement, and so the divide would get ever wider. To justify seeking one's own enhancement and dismiss social inequity with a shrug of the shoulders is not, in my view, the sign of an enhanced person but one diminished in his or her wider humanity. In an already divided and unjust world, social injustice is perhaps the biggest single ethical and theological objection to enhancement technologies, when set against the bias to the poor and disadvantaged which is stressed throughout the Bible. In the face of the increasing gap between rich and poor globally, the ethical mandate for enhancement would be directed in the first instance towards improving the lot of the 'have-nots' of the world. But that is not the way the world works.

Enhancements should be the subject of decision making at a societal level, in the first instance. The implications are too serious to be treated just as matters of personal

preference. For example, unintended social engineering would result from individual use of chemical cognitive performance enhancers. Consider the case of using Ritalin for concentration in revising for an examination. If the rewards are limited, you might lose out if everyone else uses it but you don't. It puts pressure on everyone to use it, perhaps against their values. Yet if all the students used it, it would lose its competitive advantage. But then no one dares to stop using it. The result is that no one gains. It has achieved a useless social change. People are locked into technology which has no value. Is the only 'improvement' in pharmaceutical company profits? Some have called this an ethical race to the bottom.

10.4.6. Aspiration and Satisfaction: Why be Enhanced?

What is motivating us to be enhanced, and would the aspiration be fulfilled? One might wish to overcome the sense of one's own limitation, in some activity – not to get tired so easily, or to think more quickly, to run faster, or whatever. One might seek a competitive advantage, to win the race against one's rival next time. It might be an aesthetic motivation: that one might do a good job better – make better music or a tastier dinner, be a sharper mathematician, or a more skilled woodworker or scientist. It might be altruistic: to serve or help someone else better, to be a better surgeon, a more reliable bus driver. For all of these, would we be satisfied, compared with not having been enhanced? If at last I had beaten my rival with a chemical, I would always know that I won not because I was a better runner, but because I used drugs and he did not, or that I used better drugs than him. The competition would no longer be about our abilities but our enhancements. Perhaps the most compelling satisfactions would be something like the sense of making a finer work of art or craft, just for the sake of it, or for the sake of someone else. Ironically, these are the least to do with enhancing oneself, and the most to do with loving one's neighbour or loving God.

Enhancements may be surrogates for something more profound in the human condition. Dissatisfaction with our situation leads us to want to improve it, but bodily enhancement could never ultimately satisfy us. There is an internal logic to enhancement that ought always to want the next enhancement and the one after. One would be less enhanced if one didn't take the next level up ... ad infinitum. In that sense, enhancement would become a treadmill which has no place to stop, and thus no final satisfaction. Christian theology teaches that we are created by God for relationship with God, and can never be satisfied with merely created things, even with ourselves. Good as these may be in many ways, they still leave us wanting what only God can meet.

10.5. Conclusions

Human enhancement of the type we have considered is not something which is wrong in principle. I would not say 'no never'. But it does not stand up well to wider ethical scrutiny if a Christian view of the human person is taken, if all its richer textures are considered beyond the immediate aim of improved human performance in some function of body or brain. In several of the six categories amongst which a balance would need to be found, there are significant question marks and/or objections which would need to be answered. These include risk and the difficulty of testing or validation, charlatans, social injustice, and the distortion which enhancing certain elements might have on the overall balances and dynamic equilibria within the body.

Not least of the concerns is whether internal human enhancements would actually enhance people's lives more than the more familiar tools and the patterns of behaviour by which humans seek to 'enhance' themselves in a much wider sense. The study we did for the European Commission found no great enthusiasm amongst the sets of people with whom we explored human enhancement issues, and a lot of nuanced critiques. In some limited circumstances, in certain occupations or social situations, enhancements might have a point, for example, if a drug could enable disaster recovery workers doing without sleep for extended periods. But in more normal circumstances people often could not see the point or saw too many disadvantages.

It may be that few enough examples of enhancements will prove viable that these represent only minor concerns. This may prove to have been 'a storm in a tea cup', but it would be unwise to assume this. Perhaps the deepest comment from a Christian reflection on physical human enhancement is that it misses the point of our humanity because it could never address our deepest spiritual and moral needs, nor our fallenness, nor the majority of the major issues facing humanity. Is human enhancement not wrong as such, but a distraction from the ultimate issues of being human?

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- 3 EC FP7 ETHENTECH Project : *Final report to the European Commission*, 2012, in press
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- 7 Isaiah 53, Hebrews 2.
- 8 The James Martin Institute *World Forum on Tomorrow's People*, 14-17 March 2006, Oxford. Some of the conference papers are included in: Rayner, Steve and Healey, Peter (Eds.), *Unnatural Selection: The Challenges of Engineering Tomorrow's People*, Earthscan, 2008.
- 9 CEC, *Human Enhancement – A Discussion Document*, 2009, op cit.
- 10 Commission of Bishops' Conferences of the European Community, *On the Prospects for Improvement of the Human Being (Human Enhancement)*, May 25, 2009, Brussels: COMECE, 2009.
- 11 CEC, *Position Paper : A Theological Framework for Bioethics*, January 2002, http://csc.ceceurope.org/fileadmin/filer/csc/Ethics_Biotechnology/Bioethictheol-print.htm.
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- 15 Holm, S. and McNamee, M., "Physical Enhancement: What Baseline, Whose Judgement", in *Enhancing Human Capacities*, 2011, pp. 291-303, Chichester and Oxford: Wiley-Blackwell.
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- 18 Parens, E., *Authenticity and Ambivalence: Toward Understanding the Enhancement Debate*, The Hastings Centre Report 35, 2005, pp. 34-41.
- 19 Genesis ch 30.
- 20 Bostrom, N., " Transhumanist, " in: Frederick Adams (ed.), *Values, in Ethical Issues for the 21st Century*, Philosophical Documentation Center Press, 2003, reprinted in *Review of Contemporary Philosophy*, Vol. 4, May 2005, and at <http://www.nickbostrom.com/ethics/values.html>.
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- 22 <http://en.wikipedia.org/wiki/Transhumanism>
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- 24 Genesis ch.11.

²⁵ Genesis 3:22.

²⁶ For example in Philippians ch.2 and Revelation ch.5.

²⁷ Genesis 1:28.

²⁸ Philippians ch.3.

²⁹ 1 Tim. 4:7.

³⁰ 2 Cor 4:16.

³¹ Bruce, D.M. and Walker P. (2012), *op.cit.*

³² Commission of European Catholic Bishops Conferences, *On the Prospects for Improvement of the Human Being (Human Enhancement)*, *op.cit.*

Chapter 11

CONTEXTUALISING ENHANCEMENT: RELIGIOUS AND ETHICAL ASPECTS FROM A EUROPEAN PERSPECTIVE

by Peter Dabrock

CONTEXTUALISING ENHANCEMENT: RELIGIOUS AND ETHICAL ASPECTS FROM A EUROPEAN PERSPECTIVE

by **Peter Dabrock**

The article critically evaluates the premises, main ideas and consequences of a discussion document on human enhancement issued by a CEC working group in 2010. In the first section, arguments are put forward as to why the churches had better not deal with the topic of 'enhancement' or at least deal with it in a different way. The second section looks for reasons why the churches were nevertheless willing to pay attention to this topic, while in the third section a proposal is presented how the churches could turn around their preoccupation with 'Enhancement'.

11.1. Introduction

In this contribution, I will address the content and relevance of the contexts of discussions on human enhancement. What does a 'context' mean in a topic where seemingly the whole of human existence, human activity, and human self-understanding is at stake? Do contexts exist here at all? Often we relate the discourse on contexts to the fact that they do not immediately belong to the text, that they are environmental parameters of the text, that they influence the text somehow but that they do not belong to the core of the matter. Apparently, this meaning of the word 'context' does not work for our topic. Recent debates have shown that the topic 'enhancement' itself has everything to do with some of the most basic questions of human existence and ways of living. Questions such as, "What are the goals of life?", "What is it that we want to improve?", "What is the relationship between mind, soul and body?", "Where does technology stop to make sense, at what point do we become the slaves of progress, where do we change from the ones driving to the ones being driven?", "How much gratitude and awareness of contingency is necessary, how much creativity is possible?", and "What is the connection between all of this and our understanding of God?" In brief: if these questions are understood as constituting the context of our topic, then the separation between text and context is not possible.¹ Thus, with fundamental questions on the meaning of life and their possible answers – be they given in a religious, in a non-religious, or in a pseudo-religious way – the context is nothing other than the continuation of textual references that the topic evokes. The assumption that there is a clear distinction between text and context would conceal, you could say, the fact that we can fundamentally account for our individual and collective identity with

this topic. Therefore, the context of the religious and ethical texture 'enhancement' is nothing less than the intertwining of these fundamental considerations on the meaning of life, identity formation, and even our relation to God with this issue where the fundamental breaks open.

A very different approach to the contextualisation of the debate on enhancement could be to doubt that it is about these fundamental issues and instead to insist that the topic should be dealt with in a much narrower sense. In that case different and possibly even more important aspects would come to the fore. If that was the case, then a contextualisation would be possible. My thesis is that even though the term 'enhancement' may thus seem to refer to a whole, a complex of religious, philosophical, and anthropological questions, it can and should be used in a more limited sense.

It is at this point that I am critical about the way some churches and theologians speak about human enhancement. One of the documents that I will pay attention to, is the document Human Enhancement issued by CEC in 2009.² It is my contention that we need a theological and ethical analysis of human enhancement that is more precise and careful than is found in this document. In order to develop this thesis, I will proceed in three steps.

Firstly, I argue that churches and theologians put themselves at risk when they engage in a debate about enhancement in the way they do: without a clear definition of the subject, with some of the basic concepts being vague and with expectations of enhancement that come closer to exaggerated fantasies than to reality. Secondly, I will suggest an explanation for this: perhaps it is because their own profile becomes more precise in the religious market of possibilities, with these exaggerated enhancement fantasies. In my opinion, it would be more rewarding not to get involved with those exaggerated fantasies, but to turn to theses of overcoming Man, as they are found in Nietzsche. Thirdly, on the basis of the reflections made before, I will conclude that we should deal with 'enhancement' in a more probing, self-critical way by working on the problems of the debate that are presently hidden, but are much more pressing. The European context of our present debate gives us more than one reason to do so.

As I argued above, my outlook distinguishes two meanings of 'context.' I would also prefer a different interpretation of the topic 'enhancement' to that given in the CEC paper on Human Enhancement. However, this may be a kind of contextualisation in its double meaning. Why do I do this? Maybe it has to do with the fact that it is important to me, as it should be to any theologian, to be able to answer for our faith as responsibly as possible. This entails testifying not only to oneself but also to others. Thus it is not only about a *fides quaerens intellectum* but also about an expectation put forward in 1 Peter: "Always be ready to make your defence to anyone who demands from you an accounting for the hope that

is in you; yet do it with gentleness and reverence”³ In order for *fides quaerens intellectum* and outside accountability to mutually fertilize each other, a specific form of theological argumentation is necessary. The theological approach called ‘public theology’ represents this argument appropriately. Heinrich Bedford-Strohm, bishop of the Evangelical Lutheran Church in Bavaria and one of the founders of the Global Network for Public Theology, has publicly reflected on the role of churches in the public debate. If theology and churches want to take part in public debates, Bedford-Strohm argues, they should pay attention to a number of considerations:

- the Church should only speak publicly if it has something to say;
- if the Churches speak publicly, they should do so with bravery and humility;
- in engaging in public discourse the Church should try not to politicise; still, she should be aware that her contributions inevitably have political implications;
- the taking part in public discourses has to be founded on her own traditions;
- the discourse has to be bilingual – the Church has to master the language of secular reason as well as the language of biblical and theological reasoning;
- the discourse of the Church has to be appropriate to the matter;
- the Church must not restrict its public statements to fundamentally critical objections;
- the discourse of the Church must also be prophetic-critical;
- the public discourse of the Church always happens in the context of the one world.⁴

Against the background of this open list of criteria we will now argue why the churches should look at the topic ‘human enhancement’ in a different way than is done in the CEC paper, why they have done it the way they have done it, and where they should really be putting the focus.

11.2. Why the Churches should have Dealt with ‘Human Enhancement’ Differently

By avoiding clear definitions, the CEC discussion document on human enhancement is able to be engaged in a kind of ‘horizon scanning’: one does not have to commit oneself exactly to one view but can use the deliberations even if certain developments happen in a more intensive or a less intensive way.⁵ With this in mind I take up the initial definition of the paper: “By human enhancement we mean ways to make functional changes to human characteristics, abilities, emotions and capacities, beyond what we regard today as normal, using advances in biology, chemistry, physics, materials, information technology and the mind sciences”.⁶ According to this definition there is a significant difference between enhancement and traditional methods of improvement like educational methods or training methods. Still, it is a remarkably broad definition which, in principle, could cover anything from the consumption of coffee, via mood boosters up to neural implants. The document outlines very differing techniques that fall under the afore-mentioned

definition, which is very broad and can only be understood heuristically. "Much of this is in the far future. Nearly all the claims are speculative and exaggerated. Much may never be feasible, but sufficient is realistic for enhanced human performance to become a topic for serious debate".⁷ The disadvantage of such a broad definition of enhancement is that it can mean anything – or nothing at all. 'Human enhancement' becomes like a moving target. Now, one could say that hitting a moving target is a particularly demanding challenge. Indeed it is! But when the target is hit, it may have been the consequence of a lucky shot – in which case the hunter hardly deserves praise – or it may have been caused by the use of buckshot – in which case substantial collateral damage can be done. This cannot be the goal of the churches and theologies in their public interventions concerning enhancement, when we take into account the afore-mentioned criteria for public statements of churches and theologies. In order to keep the dialogue in line with the CEC document and to contextualise it in a dual sense, I will initially take up the vague heuristic definition suggested by the churches.

By their definition the churches attempt to identify grave social and technological trends that would indeed – if they became true – cause enormous concern about how or even whether we humans will continue to exist. The scenario culminates in the fear that eventually humans will abolish themselves. 'Luckily', in a certain sense, there is the group of transhumanists around Nick Bostrom that assume this is a given fact. The views and prospects of the transhumanists are obviously unreal and show clear traits of a pseudo-religion: not only are physical and psychic diseases to be abolished but even death itself. Such rambling views – Nietzsche, to whom we will come back later, seems to be moderate compared to them – must be opposed. They show how humans tend to play God and remind us of the original sin of wanting to be like God. However, do we really want to talk with this gang? There are many indications that suggest that we are not only in a quantitative way infinitely far away from such dreams (or nightmares) but that there is also a qualitative gap separating us from those visions. In order to illustrate that we may be far away from such scenarios – be they manipulations of the brain or of the genome – just consider this. Around the turn of the century we celebrated the sequencing of the human genome when US president Clinton contended that we were now able to read in the 'Book of God'. A decade later, a single sequencing of the human genome no longer costs billions of dollars but only about 1,000 dollars. However, we still hardly know what to do with this new 'knowledge'. The only thing that has been lost by the explosion of the '-omics sciences' in those past ten years is the more or less reliable use of the term 'gene'.

Admittedly, much progress in brain research has been made: first procedures for treating Parkinson disease with brain-machine-interfaces that show great results but can still have considerable side effects. Neurally controlled prostheses allow bodily affected persons to have tremendous new possibilities. The experiments that used neurostimulation to make

rats do completely different things from those they would 'naturally' do are impressive but any application on humans is still far-off. In the field of brain research it has also become obvious over the years how little we know about this complex organ 'the brain' and its interrelations with the rest of the human body.

We can very well admire the progress in the basic sciences, in the applied sciences and in translational research. Still, however, we can also admit that from the background of genome and brain research everything is still much more complicated than many believed some decades ago. Technological transformations in the enormous complexities of the human body, to which the brain that should be altered remains bound, will not be able to be realised according to the machine model which naively forms the metaphorical background of the extreme enhancement fantasies. This is one obvious result from the serious research of the ' -omics decade ' and brain research.

So let us not lower ourselves to the level of the enhancement debate where the mad ones of the transhumanists want to lure us. Questions like: "Do you want to live eternally as unredeemed people and even without diseases?" reflect ancient desires that have already been answered many times. No matter how far the medical or technical progress goes, people will always be confronted with diseases, suffer from their mortality and still try to fight against those facts. This has always happened, just as it happens today, through a dialectics of far-fetched visions and an often very slow research process. Keeping these dialectics moving is only a reason for research.

Thus, before concentrating on the rather 'malign',⁸ i.e. weird, part of the enhancement debate, I would recommend what Armin Grunwald, one of the leading technology experts in Europe, calls a *vision assessment*.⁹ How realistic is a certain vision of a technological development? When and under what circumstances can its realization be expected? What makes it implausible? Are there social or legal regulatory regimes that hinder its realisation? Can the interests behind certain visions be clearly identified in the background of such questions? Those interests which, apart from financial ones, are also the interests of gaining public attention, can be found on the sides of both supporters and opponents of technological developments. Such vision assessment belongs at the beginning of all self-critically acting ethical considerations. However, both the optimistic transhumanists and the cultural pessimists seem to operate on the same, unsatisfying level.

In my opinion, the CEC document should have been more balanced and open minded. The document mentions many diverse biotechnological developments without giving a clear definition. It assesses them by asking rather traditional questions: is an enhancement measure external or internal to the human body? Is it transient or permanent? Does it imply small increments or radical changes? Is it medical or non-medical? Does it correct a

disability or does it create an ability or even a 'superability'?¹⁰ Even though the document admits that the grey zones are vast,¹¹ there is no baseline for clear assessment and ethical assessment would have to be accomplished case by case.¹² Nevertheless, the tone and the direction are clear: measures external to the human body, transient, small, medical, and against disability or for achieving ability are basically acceptable. However, internal, permanent, radical, non-medical, superability measures have to be regarded more or less sceptically. The CEC document concedes that theologians do not have a kind of special knowledge concerning worldly issues or in questions of secular objectivity¹³ but fails to be consistent on this point. When it argues that "enhancement is a misleading hope",¹⁴ it is not clear on which sources this and other statements are based. By doing so, it is at risk of ignoring the quoted claim of public theology to argue in a substantial way.

The Formal Question

I would therefore suggest two 'testing questions': a formal and a substantial one. The formal one can be called the 'Catweazle-argument'. In the seventies the BBC broadcasted a TV series about the weird 11th century wizard Catweazle who, while fleeing from the Normans, ends up in the 20th century. Here he is confronted with the achievements of modern civilization: a tractor becomes a 'magic war chariot', the telephone receiver becomes the legendary 'telling bone', all of this being made possible by the magical 'electrickery'. From Catweazle's point of view, most people in the modern world are gigantic enhancers. We are able to fly, cross time and space in a magical way, and undergo surgical operations without much pain. Values and assessments may thus shift very quickly. The first question is therefore: can a hostile, fearful attitude towards new technologies not be explained in terms of a lack of familiarity with, and knowledge of, these developments? From this question follow other questions: is it right to argue that certain technological developments, *per se*, undermine our identity and authenticity, our solidarity and justice? Is it justified to argue that such advances would result in nothing but human self-deification or that there would, at least, be a high risk of that happening? Put differently: is it plausible to argue that those values which have such a high intrinsic value to us lose both their right and their possibility to exist just because a certain technology is being developed?

Let us take the example from the CEC text where it is feared that only a certain elite will be able to afford enhancement tools. This would create a socio-ethical problem. This would be rather different from the 'universal availability of a television or a mobile phone'. I can very well remember the time (in the mid-1980s) when a mobile phone cost 5,000 Euros and one call minute 2 Euros. Was that 'universal availability'? In a word: a technology in itself is neither good nor bad, nor does it qualify *per se* by trickling down or not. It is the ambitions that people pursue or the attitude they express when pursuing them that are problematic or that lead to a further distribution. This is valid for all cultural eras, not only ours, and will not change. Does therefore moral progress not exist? Haven't we learnt

something? The famous theologian Paul Tillich holds that there is progress in human history, not only on the technological but also the moral level. Few will doubt that the growing acknowledgement of human dignity and human rights is a form of moral, legal, and political progress. However, Tillich is alert – theologically speaking – to original sin, in non-theological words: to a destructive power that obviously bursts open in each human being time and again afresh.¹⁵ I thus see no intrinsic reference of any technology to evil. Even nuclear technology, with the potential to destroy humankind like no other technology, can hardly be called evil *per se*.

But although there is no reason to see enhancement as intrinsically evil, we can still ask critical questions. It may evoke false hopes and give false stimuli. Its procedures can neither solve private nor social problems. In fact, technologizing and medicalizing the respective tensions is barking up the wrong tree. But again, it is unwarranted to assume that the problem is due to technology; instead, it has to do with an attitude of mind that may be intensified by the use of this technology. If we adopt a different attitude, certain technologies and procedures that are generally linked to the term enhancement here and thus criticized can be used constructively, which is the logical consequence of the thesis that it is the attitude and not the technology that is at stake.

The Substantial Question

Here I come to a second question which I call the avoidance of the Neo-Platonism fallacy. In Platonic, especially Neo-Platonic, thinking, there is a strict distinction between the purely intelligible world and the sensual corporeal world. The influence of this philosophy stretches from Augustine via Descartes up to the transhumanists. It not only opposes the Bible's integrative conception of the world and human beings, which does not acknowledge this hierarchy, but it is also unsupported by the modern phenomenology of the body. The human being is embodied reason. Mind, soul, and reason are *aspects* of the human person as an integral being, not independently existing entities. The body is the human person in so far as it is identifiable as the same, as *idem*, from the outside. The soul denotes the aspect of the human being that allows us not to leave it in external identification; it is the aspect of the human being whereby humans transcend themselves. The mind is the facet of the human person that enables her to relate to herself. She does this, however, as a person and thus as an embodied being. If we cannot have one of these aspects without the others, if the human person is always affected as a whole by an event, then what becomes problematic is the thesis that an allegedly interior change would *per se* be more dangerous and thus morally less acceptable than one originating from the outside. I do not argue that the application of psychoactive drugs as concentration or mood boosters is morally acceptable beforehand. But apart from the question *why* people use these drugs – to which I will return below – it should be asked *why* such quack remedies would be considered worse than the influence of, e.g., external incidents or training methods. Is it

due to the alleged irreversibility that is associated with an intervention *in* the body? Let me explain this with the help of an example. Which one has probably more serious influence on the further development of the personality: the trauma of abuse or the temporary use of a pill that is used to lighten a dark mood (the latter is called enhancement by the CEC document and may thus be deemed a 'false hope')? Does here, after all, an old hierarchy that understands the body as the gateway to sin and weakness interfere with our moral judgement? Against this background, certain so-called enhancement measures may be much less problematic than other effects of social communication. Do not the churches become the victims of their own neo-platonically shaped history if they criticize enhancement measures more or less generally? Would we not have to question the blind spots of our *own* ethical criteria in the ecclesiastical critique? Do we deal with this topic just because we still believe that influences on the person that we understand in the bodily dimension to be specifically dangerous?

"And he said to them, 'Then are you also without understanding? Do you not see that whatever goes into a person from outside cannot defile him, since it enters not his heart but his stomach, and is expelled?' [...] And he said, 'What comes out of a person is what defiles him. [...] All these evil things come from within, and they defile a person.'"¹⁶ Although the CEC document affirms the close relationship between body, soul and mind, it could unintentionally revive anthropological dualisms that have been thought overcome. Instead, should we not make a more careful, case by case analysis of invasive or pharmacological procedures which are here included under 'enhancement,' and which are considered as morally problematic according to ethical criteria? What has to be considered is the extent of the intervention, its expected risk in the dimensions of time, matter and society, its reversibility, its retinity (meaning preserving its interconnection), and sustainability. All of this has to be done case by case instead of generally and by drawing conclusions from a measure judged rather problematic by the aforementioned criteria, which are intended for the assessment of a much simpler one. Therefore, the question arises whether enhancement measures have to be legally regulated or not. The question cannot be answered plainly and simply in a general way, but is dependent on the criteria mentioned.

Before proceeding to the following section, let us subsume the argument thus far:

- The far-fetched expectations of the transhumanists prove to be nothing more than a flight of fancy.
- On closer inspection, the term 'enhancement' tends to dissolve since the introduced heuristic criteria like 'external or internal to the human body', 'transient or permanent', 'small increments or radical changes', 'medical and non-medical', 'disability, ability and superability' do not work, at least not for the more realistic trends of the so-called enhancement.

- The general criticism of enhancement does not pass the Catweazle test: a technology is *per se* neither good nor bad. What counts is the intention or behaviour linked to it.
- Furthermore, the general criticism of enhancement tends to be subject to the Neo-Platonism-fallacy.
- Case by case assessment has to be made according to the established bio-ethical and socio-ethical criteria.

All of this leads to the question: why did the churches focus attention on this topic?

11.3. Why the Churches attended to this Topic

One of the reasons why reflection on human enhancement is attractive and challenging for churches is that it may strengthen their own profile in an allegedly pseudo-religiously charged field of phenomena. Of course there is nothing wrong about showing one's colours in a current bio-political or bio-ethical debate: public theology is what churches *should* be doing. What seems to happen in the enhancement debate, however, is that both the secular salvation vision of the transhumanists and more moderate approaches to enhancement are measured by the same yardstick. This may help churches to highlight their own message more convincingly. The fact that the field of phenomena of 'enhancement' proves to be a moving target when examined more closely, does not have to be an obstacle to this intention.¹⁷ If it is true that it is not the technology itself but its *use* that raises ethical questions, then the debate on enhancement could be made less dramatic. The clear profile of a theological-ethically responsible usage of technology can then be developed not only from a Christian perspective but also on this side of the transhumanists' fantasies, without having to fall into technophobia or cultural pessimism.

Before developing criteria that could apply to enhancement, let us look at a most challenging text of Nietzsche. Much more clearly than any transhumanist can do, this text shows the challenge we face in the context of the enhancement debate. In Nietzsche's *Thus Spoke Zarathustra*, Nietzsche lets his Zarathustra proclaim the overman:

"I teach you the overman. Man is something that shall be overcome. What have you done to overcome him?"

All beings so far have created something beyond themselves; and do you want to be the ebb of this great flood and even go back to the beasts rather than overcome man? What is the ape to man? A laughingstock or a painful embarrassment. And man shall be just that for the overman: a laughingstock or a painful embarrassment ...

Behold, I teach you the overman. The overman is the meaning of the earth. Let your will say: the overman shall be the meaning of the earth! I beseech you, my brothers, remain faithful to the earth, and do not believe those who speak to you of otherworldly hopes! Poison-mixers are they, whether they know it or not. Despisers of life are they, decaying and poisoned themselves, of whom the earth is weary: so let them go.

Once the sin against God was the greatest sin; but God died, and these sinners died with him. To sin against the earth is now the most dreadful thing, and to esteem the entrails of the unknowable higher than the meaning of the earth.

Man is a rope, tied between beast and overman – a rope over an abyss.

What is great in man is that he is a bridge and not an end: what can be loved in man is that he is an overture and a going under..."¹⁸

This is a manifesto that really challenges Christianity because it takes religious motives in a congenial manner: man is something that has to be overcome. Yes, this is how technology is used, and exactly such theses are coined by religions themselves, at least by the religions of salvation. St. Paul says accordingly: "If anyone is in Christ, there is a new creation: everything old has passed away; see, everything has become new!"¹⁹ According to the rule, religion is the radical transformation of the *status quo* which is not simply perceived as good. Even though the world as creation is good, very good, Christians also hope for better, that is completion: "And it is no longer I who live, but it is Christ who lives in me."²⁰ This may explain why some Christians and churches participate in the enhancement debate in an almost over-sensitive way, even in its Utopian variants: something of their own – even if it may be only their own shadow – is visible. Radically challenging questions are being asked: if transformation forms the 'essence' of religion, what do humans contribute to this process? Are humans able to contribute to their own completion, be it individually or collectively? Do they play a passive or an active role? Is the completion the renewal of the origin, an evolutionary or revolutionary transformation of the present, or is it something radically different? The history of Christianity answers these questions in many ways, often across the limits of denominations. It is my contention that if transformation is part of the essence of religion, of the very essence of Christianity, then enhancement could very well present a Christian option, at least in the breadth of the term that the CEC paper chooses. The Edinburgh theologian Todd Daly points out striking structural parallels between the theosis concept of Athanasius and transhumanist fantasies.²¹ On the surface, for both a longer life is at stake, for Athanasius by fasting, for the transhumanists as a result of biotechnological alterations to the body. Certainly, Athanasius knows that the goal of fasting is not a long life but that it is preparing the way of the Lord; the transhumanists lack a perspective of transcendence and they would, surprising to some, not rely on the efforts of asceticism. The secular alternative offered by Nietzsche does not appear to be as flat as it is in transhumanism. To be sure, he thinks in secular ways and radically denies the existence of God. Hence, the transcendental encounter with God is replaced by the quest for the overman, immanent in the world. However, Nietzsche is aware of the effort needed if man wants to raise himself to the overman, not the superman. Yet, he does not support a dull Social-Darwinism, even though some parts of Zarathustra sound like that. Rather, the quest for the overman proves to be an intensification of this world especially regarding the absent hope for an afterlife. Human life is thus not led by a hedonistic or utilitarian happiness-calculus. This attitude is unwavering and Nietzsche does request

a close relationship to the earth, as he calls it. For Nietzsche, this relationship comes along effectively, rather 'naturally' from the immanence perspective. Life is, according to Marianne Gronemeyer, the last opportunity.²² Thus, a human being is, in Odo Marquard's words, a 'lack-of-time being'. Therefore Zarathustra sticks to the earth and celebrates the importance of the body. However, this bodily concern is not just dull hedonism. It has noble ideals beyond the short-term fulfilment of happiness, especially for those who seek for the overman in the world's immanence and have to fight hard.

Does it surprise anyone that the immanently thinking and living human being, radically bound to earth and the body, uses all kinds of technology? Due to the notorious lack of time humans naturally aim for 'gaining time' (Ortega y Gasset) and thus take on the effort of saving efforts by technologies, including biotechnologies.²³ Enhancement is not about improving oneself effortlessly, which can be learned from Nietzsche, and which other theorists of today like Peter Sloterdijk also point out, but it is about staying in the game of life under the circumstances of scarce time and heavy competition. What motivates enhancement strategies is the urge not to go down at this frontier and yet to be able to realise life plans. It is not only the wish to exist but also the desire to 'fare better than well'.²⁴ In this context of closeness to earth and body, to technology, in this context of limited time with the desire to gain time in the face of massive competition, clearly the whole is at stake. Christianity seeks answers of lasting importance to questions with momentary urgent public aspects (D. Ritschl). In this case: on the subject of the closeness to body and earth, on the notorious lack of time and our attempts of technical compensation, as well as on the challenges of massively experienced threats of competition and exclusion. In doing so, out of different traditions, Christianity seeks to be relevant not only to believers but also to those that do not own the gift of faith. Can we act appropriately? Do we see the real background of the enhancement debate in here? Or does the hope for completion mean the end of such questions?

Let me answer this on two different levels. On the first level, I will try to react to Nietzsche by suggesting an alternative conception of life. On the second level, I will return to Armin Grunwald's vision assessment in order to subsequently respond to the actual *desideratum* of the enhancement debate.

First: yes, I do find faithfulness to earth and body in biblical stories in God's and Christ's commitment to the ones marginalized and in the hope for resurrection which is valid for the whole body, the temple of the Holy Spirit. However, there are important (at least to me) shifts of emphasis in the biblical message and the Christian tradition compared to Nietzsche, and even more so compared to the transhumanists. There are criteria that we can include into a society in which questions of pharmacological and biotechnological increase in efficiency become urgent. I find them at the end of Luther's freedom tractate

in a condensed form: "We conclude therefore that a Christian man does not live in himself, but in Christ, and in his neighbour, or else is no Christian; in Christ by faith, in his neighbour by love. By faith he is carried upwards above himself to God, and by love he sinks back below himself to his neighbour, still always abiding in God and His love."²⁵ According to Luther, freedom of life cannot be found by the Christian – and I dare to add by any human being – by only caring for himself. Care for the body, finding and forming oneself, and attaining happiness are side effects which result from being at ease in life relationships. Christians find themselves trustfully secure (humans can gain those experiences); they are pulled out of their self-care for their own sake. "Carried upwards above and sinking back below himself," these are the movements that result in finding oneself. Due to this new fundamental trust humans, neither carrying the burden of fearfulness at the beginning nor at the end, can devote themselves to their neighbour's concerns. Vulnerability, fragility, and contingency are – different from for example, Sandel's plea²⁶ – not ends in themselves. But when people admit them, learn to accept their limitations in regard to their finiteness and trust in being carried by infinity, this presents a substantial alternative to Nietzsche.

In his assessment of the ideology of enhancement, Oliver Müller argues that certain questions of life, especially questions of meaning, cannot be explained in a technological way but need human communication and the commitment of the whole person in all its aspects.²⁷ His analysis is deepened when we turn to Luther's existential concept of personality. To put it in biblical words which remain phenomenologically plausible, for non-Christians as well: "Those who try to make their life secure will lose it, but those who lose their life will keep it."²⁸ Seemingly, humans try to make their lives secure when their lives amount to nothing more than self-care and self-development. Of course: people do have plans and responsibilities in life and do have to care for themselves. Moreover, Nietzsche's observation is also right that human beings are beings in transition. Christian faith, however, insists that the enormous human freedom, which releases power for others, springs from trusting in the knowledge that, ultimately, we do not have to make everything right ourselves. Moreover, different from what Nietzsche or the enhancement utopians state, this transition is about an extremely complex network of relationships where freedom is primarily understood as togetherness and not as disengagement or absoluteness. Thus, life can become better not by searching for perfection but by the richness of relationships we enjoy. In this sense, churches and theologies can indeed present essential alternatives to the calculation- and technification-cult of human self-fulfilment. But they should also face the question whether they themselves would take faith in the earth and body, as claimed by Nietzsche, as seriously as their own traditions make possible. Still this significant differentiation in striving for the meaning of life, which the Christian message offers, is, of course, a chance for it to distinguish itself. Possibly one of the reasons why the churches have taken up this issue so vehemently was to grab this chance. Still, does one have to resort to the transhumanists and their partly crazy ideas

to do so? Does one – even if opposing to technocratic concepts of life – have to use the vague term ‘enhancement’?

11.4. How the Churches could turn around the Preoccupation with ‘Enhancement’

Let us resume the need for vision assessment. At the end of 2011 a voluminous report was published by the Technology Assessment Institute of the German parliament (TAB). This institute is led by Armin Grunwald and is one of the biggest technology assessment agencies in Europe.²⁹ The report, fruit of a four-year research project on the topic, draws conclusions about human enhancement that are even more disillusioning than those we suggested above: that the transhumanists’ ideas are mere Utopian dreams. Expectations on pharmacologically induced improvement of mood and cognition, for example, have been completely disappointed. The respective pharmaceuticals have important side effects and are almost inefficient; they are especially useless for people who do not have any diseases or mental deficiencies. Furthermore, it cannot be expected that pharmacological licensing processes will be changed – at least not in Europe in the near future. Since experimental drugs in Europe are only allowed in the case of proven cases of illness, we cannot expect any systematic and specific research of the pharmacological enhancing of non-invalids. These considerations could also have been made in the process of discourse of the churches.

If ‘pharmacological neural-enhancement’ has been shown after such a vision assessment to have extremely limited relevance for the present, the churches could have asked why this topic was building up such a head of steam in society and science. Why do so many people think it necessary to use mood boosters or pharmacological support in order to cope with cognitive or other tasks at work? Already in 2008 Christoph Coenen of Karlsruhe Institute for Technology (KIT) suggested that the real question behind the enhancement debate may stem from our incapacity to deal socially with performance requirements in modern society.³⁰ Today this question becomes even more urgent, as the figures of unemployment, especially of youth unemployment in the EU are terrifying, among other things as a consequence of failed political stimuli and of an unleashed financial system from which too many have wanted to profit for too long. Furthermore, it is the demographic change that worries many people, their fear for their retirement arrangements in the course of financial and economic crises. These are the real concerns – and thus enhancement measures or the trust put in them are no Utopian fantasies, but rather the clutching at a straw or life raft against German *angst*.

So, instead of criticising the means which are both ideologically and – as the TAB-report indicates – practically false, the churches again have to address the underlying social

problems in a more intensified manner. Otherwise they do not only get lost at the sideshow but fail to get down to the root of the trouble, the reason why enhancement is discussed in the first place. I tend to believe that there is not primarily a spiritual or ideological issue behind the enhancement question. Rather this whole debate is a surface manifestation of a deep social crisis. The churches, at least those that take seriously the biblical message of God's faithfulness to the people and its preference for the disadvantaged, should turn away from the sideshow and turn towards the serious social problems. This can happen in at least two ways. First by the *via negationis*: by making public the very limited significance of the enhancement debate so that a deconstruction in the best meaning of the word can be carried out. Then, secondly, by giving priority to the currently urgent questions, which today include issues of lasting importance. Maybe the churches can help so that there is no longer the desire for a life controlled by technology. Apart from protesting against the forms of political and economic power that want humans to serve the system and not the system to serve humans, we should, for example, learn to view the demographic change as a great chance. "The European Year for Active Ageing and Solidarity between Generations" 2012 was a step in the right direction. Perhaps not everyone will be happy if the churches would redirect their attention to these social and societal problems underlying the quest for human enhancement. But we need to do so. If we make steps in this direction, we will perhaps set something up against the primacy of the achievement-oriented society and will make both enhancement and the enhancement debate superfluous.

¹ Cf. Wilfried Härle, *Ethik*, Berlin/New York: De Gruyter, 2011, pp. 129-33.

² http://csc.ceceurope.org/fileadmin/filer/csc/Ethics_Biotechnology/Human_Enhancement_March_10.pdf

³ 1 Peter 3:15.

⁴ Cf. Heinrich Bedford-Strohm, "10 Thesen zur öffentlichen Theologie," in: EKD (ed.), *Raus mit der Sprache. Themenheft zum Reformationstag*, 2011, p. 28. <http://www.kirche-im-aufbruch.ekd.de>

⁵ Cf. Oliver Müller, *Zwischen Mensch und Maschine. Vom Glück und Unglück des Homo faber*, Berlin: Suhrkamp, 2010, pp. 9-16.

⁶ CEC 2010, p. 7.

⁷ *Ibid.*, p. 2.

⁸ Matthias Kettner, "Hum anismus, Transhumanismus und die Wertschätzung der Gattungsnatur," in: Kurt Bayertz (ed.), *Die menschliche Natur: Welchen und wie viel Wert hat sie?*, Paderborn: Mentis, 2005, pp. 73-96 (quote 93).

⁹ Cf. John Grin and Armin Grunwald (eds.), *Vision Assessment: Shaping Technology in 21st Century Society: Towards a Repertoire for Technology Assessment*, Berlin, etc.: Springer, 1999.

¹⁰ CEC 2010, pp. 7-8.

¹¹ *Ibid.*, p. 3.

¹² *Ibid.*, pp. 9, 8.

¹³ *Ibid.*, p. 10.

¹⁴ *Ibid.*, p. 19.

¹⁵ Cf. Paul Tillich, *Systematische Theologie*, vol. 3. Berlin/ New York: De Gruyter, 4th ed. 1987, pp. 380-7.

- ¹⁶ Mk 7:18ff, ESV.
- ¹⁷ *De facto* it becomes obvious that the CEC paper especially concentrates on those enhancement methods that are based on pseudo-religious ambitions 'far beyond the medical context' (*CEC discussion document*, 11) and mostly completely speculative.
- ¹⁸ Friedrich Nietzsche, *Thus Spoke Zarathustra: A Book for None and All*, trans. Walter Kaufmann, New York: Penguin, 1954, pp. 12-5.
- ¹⁹ 2 Cor 5:17.
- ²⁰ Gal 2:20.
- ²¹ Todd T. W. Daly, "Chasing Methuselah. Transhumanism and Christian Theosis in Critical Perspective," in: Ronald Cole-Porter (ed.), *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement*, Washington: Georgetown University Press, 2011, pp. 131-44.
- ²² Marianne Gronemeyer, *Das Leben als letzte Gelegenheit: Sicherheitsbedürfnisse und Zeitknappheit*, Darmstadt: Wissenschaftliche Buchgesellschaft, 1993.
- ²³ Cf. Müller, *Zwischen Mensch und Maschine*, p. 93.
- ²⁴ Cf. Carl Elliott, *Better than Well: American Medicine Meets the American Dream*, New York: Norton & Company, 2003.
- ²⁵ Martin Luther, *WA 7*, pp. 20-38, quote 38; trans.: *Concerning Christian Liberty. Conclusion of the Treatise*. URL: <http://www.iclnet.org/pub/resources/text/wittenberg/luther/web/cclib-3.html>.
- ²⁶ Cf. Michael J. Sandel, *The Case against Perfection: Ethics in the Age of Genetic Engineering*, Cambridge/London: HUP, 2007.
- ²⁷ Cf. Müller, *Zwischen Mensch und Maschine*, pp. 192-199.
- ²⁸ Lk 17:33; cf. 9:24: 'for my sake.'
- ²⁹ Arnold Sauter and Katrin Gerlinger, *Pharmakologische Interventionen zur Leistungssteigerung als gesellschaftliche Herausforderung* ("Pharmacological Interventions for Increasing Performance as a Social Challenge"), Berlin: Büro für Technikfolgen-Abschätzung beim Deutschen Bundestag, 2011.
- ³⁰ Cf. Christoph Coenen, *Schöne neue Leistungssteigerungsgesellschaft?*, TAB-Brief No. 33, 2008, pp. 21-7. <http://www.tab-beim-bundestag.de/de/pdf/publikationen/tab-brief/TAB-Brief-033.pdf>.

Chapter 12

WHAT CAN WE LEARN FROM THOSE WHO HAVE GONE BEFORE?

by H. E. Metropolitan Emmanuel of France

WHAT CAN WE LEARN FROM THOSE WHO HAVE GONE BEFORE?

by **H. E. Metropolitan Emmanuel of France**¹

Human enhancement is a contemporary issue that is as much cutting-edge as nanotechnology, instant world-wide communication, and the revelations of the Human Genome Project. It is also as old as the temptation of Adam and Eve in the Garden of Eden. Since the Garden experience, 'knowledge' has been used to tempt humanity with the power to be like God. At other times, God has revealed knowledge to humanity leading to important interventions in many areas of human suffering. How can we better understand the increasingly complicated moral, spiritual and ethical questions that are emerging with advances in science, technology, and medicine? According to His All Holiness, the Ecumenical Patriarch Bartholomew, we first need 'reconciliation'.

Thus, it is vital that we proceed with these discussions precisely because our world needs to hear how today's issues can be illuminated by an ancient and ever present Divine wisdom. There is an often-quoted observation from the early twentieth century that will quickly be recognised by many: "Those who cannot remember the past are condemned to repeat it".² Let us remember the past with the expectation of moving into the future guided by a sober realisation and a hopeful heart: a sober realisation that good intentions can have dire consequences, and a hopeful heart that actions we take now have the potential to preserve life and effectively alleviate a great deal of human suffering.

As we look to history to inform our future, I would like to begin with the events of the Garden of Eden. There are fundamental truths found in Genesis chapters 2-3 which provide some interesting concepts for consideration. First, I can't help but notice that God planted two significantly named trees in the Garden: the tree of life and the tree of the knowledge of good and evil. "Out of the ground, the LORD God made to grow [...] the tree of life in the midst of the garden and the tree of knowledge of good and evil".³ In an ontological reading, like the one performed by Annick de Souza, moral categories of 'good' and 'evil' do not exist.

'Good' is understood as being 'accomplished' as opposed to being 'not yet accomplished'. The Garden in Eden is understood as the inner space of the human being, in whose heart stand the tree of knowledge and the tree of life. The two trees are distinct but not

separated. In the tree of life – the symbol of God’s desire for the human being – the sap goes down from God to the human being; in the tree of the knowledge – the symbol of the human being’s desire for God – it goes up from the human being to God. The accomplishment of the human being is the fruit of the encounter of these two desires; of the cross-fertilisation between life and knowledge. Herein lays the first key to forming recommendations regarding human enhancement: the pursuit of knowledge must be balanced and moulded from a reverence for the mysteries of life.⁴

Openness to new and old insights

We, as citizens of the world in the 21st century, are in a unique position. Global satellite communication and digital technologies put more information at our fingertips than the mind can conceive. The Biblical accounts of our predecessors, the writings of the Church Fathers, and the latest medical journals can all be accessed in a matter of minutes. Therefore, we certainly have the resources to ‘open science for new dimensions of understanding’ and, perhaps, prevent ‘the worse’ from occurring. One barrier I see to this accomplishment is an inherent bias toward contemporary understanding. Why limit ourselves to knowledge that is emerging in our lifetimes? Let us endeavour to put aside any arrogance that would dismiss the wisdom of the Bible, the Church Fathers, and all of history because we believe our generation is better educated. Has modernity truly provided us with definitive knowledge?

I have a similar concern for the Church and spiritual leaders. In various faith circles, there is oftentimes a bias against anything new. For example, if the Church in the 17th century had dialogued about Galileo’s hypothesis, which holds that scripture and the conviction that the earth revolves around the sun are not in disagreement, they might have recognised the truth and reformed their position that the earth was the centre of the universe. Misunderstandings on the part of the Church and the polemical writings of the scientist led to the unfortunate conflict. This led to the sentencing of Galileo and holding him under house arrest for the remainder of his life. From this tragic event in Church history we can learn not to allow ourselves to become offended at the suppositions of others to the point that we refuse to explore the possibilities of the unfamiliar, and find areas of agreement. Let us take the time to fully understand the ideas and values of those who have gone before us and integrate that knowledge into our contemporary discoveries. This level of information creates for us the greatest opportunity to develop recommendations that respect the contributions of the ‘tree of life’ and the ‘tree of knowledge’.

Once we have a broad-based and open-minded review of ancient and contemporary ideas, we need to take one further step. We need to acknowledge our inability to really know how different forms of human enhancement will impact humanity for all posterity. This compels us to seek Divine participation in human affairs. We must go back to

the Garden and weigh the choices Adam and Eve weighed. They were in the physical presence of God daily, in constant communication and communion with the Holy One who embodies knowledge and who created all knowledge. Yet, based on the word of a serpent – who like them was also a created being, they traded their intimate knowledge of the uncreated Creator for the prospects of another kind of knowledge. We are all created beings trying to convince ourselves and others that one form of knowledge is better than another so that this one form should be pursued and the other may be discarded. But we cannot unilaterally accept these assumptions. We must seek the Divine within the light of our existing knowledge and humbly pray for guidance. Where Divine guidance will lead us on these issues, I do not yet know. However, based on the previous examples I have shared with you from my heart, I have the following thoughts about what our recommendations must take into consideration:

- Let us pursue a knowledge which is balanced and moulded from a reverence for the mysteries of life. In doing this, let us realize that issues of knowledge and life are interconnected and in their very essence cannot be separated.
- Let us acknowledge that humanity is composed not merely of physical components, but also consists of a soul, mind, emotions, and spiritual attributes which, like life and knowledge, cannot be separated from the whole being.
- Let us recognize that we are all created beings and as such are capable of being deceived when desiring to increase our knowledge.
- Let us realize that we cannot know all things, but can be enlightened by examining ancient and contemporary knowledge in an integrated manner.
- Let us be aware of the power of prayer and meditation in guiding us to make recommendations that will benefit humanity over time.
- Let us recognize our humility in making these recommendations.
- Let us take comfort in the knowledge that there is forgiveness for humanity when they miss the mark.

The time has come for us to explore, deliberate, and seek the Divine. In discussing the topic of human enhancement, we must create an environment where we are all free to honestly express our ideas and concerns. Likewise, we must endeavour to restrain ourselves from judging the possibilities of human enhancement issues from a position of fear, ignorance, or offence. Let us be as wise as serpents and as gentle as doves in our reflection. I have great faith that if we take all these lessons from scripture, tradition, and history into consideration, we will develop convictions and draft statements that will bring balance, wisdom, and appropriate caution to future implementation of these technologies. In conclusion, I would like to quote His All Holiness, the Ecumenical Patriarch, Bartholomew 1st: “Christians must remember that Church is called not to conform to but to transform this world”⁵

- ¹ This text was presented as an opening paper at the CEC Conference in Brussels. It was preceded by the following greeting words: "With heartfelt appreciation and joy, I welcome you to this conference and trust that you will find meaning and challenge in the discussions taking place regarding our role in the contemporary practice and future development of Human Enhancement. In the first place, allow me to share with you the greetings of His All Holiness, the Ecumenical Patriarch, Bartholomew 1st."
- ² George Santayana, *Reason in Common Sense*, volume 1 of *The Life of Reason*, 1905.
- ³ Genesis 2:9, ESV.
- ⁴ Michel Maxime Egger, *La terre comme soi-même*, Labor et Fides, 2012, p. 243.
- ⁵ Patriarch Bartholomew, *Encountering the Mystery*, New York: Doubleday, 2008.



Chapter 13

SCIENCE, VALUES AND JUDAISM

by Albert Guigui

SCIENCE, VALUES AND JUDAISM

by **Albert Guigui**

13.1. Introduction

In this paper I will address the theme, 'science and values' from a Jewish perspective. It would be wrong to deny the inherent results of scientific progress which we know. It would even be self-destructive to argue that science today should be restrained. Once humans were born and died. Today human beings are born and they live. In the past, humanity struggled with nature to wrest from it the means necessary for existence. Poverty and suffering were the daily lot for human beings in general. Today, nearly everywhere on the planet, we have moved on from an existence of bare survival to a secure and oftentimes abundant way of life. More and more human beings can now live for the length of time programmed by their biological makeup. They enjoy a comfort undreamt of before and that is thanks to the patient and daily struggles of scientists in all areas and all times.

It is in this context that we should now question ourselves about the rapport between science and Judaism which is not obvious. Two schools confront each other. One is defended by the famous Israeli intellectual and polymath Yeshayahu Leibovitz.¹ In his book *Science and Values*, Leibovitz argues that science and religion have become totally estranged.² Today the world of values is completely separated from the world of science. The one, religion, is not concerned with either science or learning but only with eternal life in the future. Science, on the other hand, is neither concerned with religion nor with esoteric knowledge. It is only interested in the life of here and now. Scientific knowledge makes humans aware of available information but does not demand that they need to do anything about it. On the other hand the principle underlying religious faith is that the believer is involved.³ According to Leibovitz we are part of two worlds in a universe which is unique in its essence, its significance and its objective. Science and values are two independent entities and should not be linked to each other. Each should remain autonomous and independent of the other.

This position is not shared by other Jewish thinkers. According to them the universe is one, not two entities and does not fit in with the idea of a division of tasks. In his book entitled *Jewish ethics and modernism*, Alexandru Safran explains that this is the reason for the crisis existing today.⁴ According to Safran, Judaism insists that humans are to know God: they should search for God through science and serve him through ethics. He associates

science and ethics, because they are two manifestations of one and the same higher force. 'To learn' is a commandment for the Jew: he is expressly ordered to study and to search. Humans lift themselves to God by exploring God's achievements and this is how the ways which separate them from God become clear. Humans lift themselves to God through knowledge, that is to say by climbing the pathways of reverence, which is why it is said: "Where there is no knowledge there is no reverence."⁵ In the Jewish tradition science is not just tolerated. Science is the expression of a duty, the duty to know, and which stretches the physical world into the metaphysical world.

13.2. What does the Bible say?

Faced by these two schools of thought let us look at the Biblical text and see what message it conveys. The Biblical text which best seems to reply to the problems of our debate is the well-known story of the Tower of Babel. It takes us to the heart of the problem. It demonstrates the type of science of which the Biblical text is critical. The Bible rejects all scientific research which does not have as its final purpose the building-up and progress of humankind. The Bible is opposed to all scientific research which aims to make humans as powerful as God – portraying them as competitors rather than partners of God that bear a responsibility to manage the world entrusted to them. The passage which tells the story of the Tower of Babel has only nine verses. It begins with the following words "Now the whole earth had one language." At the beginning humans were united, engaged in common projects, aimed at developing and forwarding human progress. Very soon, however, the vocabulary in the text changes. Human progress is no longer the aim. "They said one to the other...let us build ourselves a city and a tower with its top in the heavens and let us make a name for ourselves."⁶

When science turns away from its vocation, when it becomes science without a conscience, it changes into a source of evil and dispersal. The Midrash⁷, commenting on this Biblical passage, explains the principal fault committed by the generation of the Tower of Babel. The construction of the Tower was well organised. The workmen used a ramp positioned to the East to speed up the supply of bricks to the masons. They used another ramp positioned to the West for descending. If a man slipped and fell from the ramp, injured himself and possibly even died, nobody took care of him. Without any sign of pity another man would take his place. On the other hand: if a load of bricks fell, the planners would start to weep, saying "When will we succeed in getting the other bricks up?"⁸ For them individual human life no longer had any intrinsic value. One man could be replaced by another man. It was enough to put another number in his place. The loss of a stone, however, mortgaged the realization of their project. This situation was untenable. Humans had become pure means of production, tools, objects, machines capable of continuous production. They lost their finality as human beings, unique and irreplaceable. Now we know that, at least since Kant, the golden rule of ethics is to never consider a human being

as a means only. The Gaon of Vilna taught that if the other becomes a means we lose our own liberty and our own humanity.⁹

The punishment for the generation of the Tower of Babel was the confusion of language. Mutual misunderstanding, loss of respect and intolerance followed and the ultimate consequence of this was that humans became slaves to the material. But perhaps it is false to say that God punished humans. Humans punished themselves. The harm which they suffered was caused by their very own acts. And the building of the Tower of Babel is only one of many examples. A modern example is the continuous depletion of the ozone layer carrying the risks of a new flood is not a divine punishment. It is the consequence of the shameful way in which humans have exploited nature. Nature is just taking its revenge on humans who have not known how to shoulder their responsibilities.

13.3. What Lessons can we Draw from this Today?

The story of the Tower of Babel speaks directly to us. When we recall it, it has a message. We are living in a century in which technological progress increases at an ever faster rate. Technology reigns as an absolute master. Riches grow abundantly. More and more we are seeing that our world instead of being an island of solidarity is becoming a hell – a world governed by selfishness and by the principle of ‘everyone for himself’. Think of some of the examples from daily life. Ways of communication have never been more sophisticated. The world has become a global village. Events which happen in the most far-flung parts of the world involve us directly through television and information technology. However, loneliness has never been as common or as painful.

Most of our young people lack nothing. But although they have it all – money, diplomas, careers – they seem not to be happy. They want something that they, themselves, do not manage to define. As a result, many of them turn towards an artificial paradise (drugs, sects) and become an easy prey for those gurus who profit from their fragility. In a world where profit and economic growth are considered the highest values, many humans seem to have lost their dignity. They no longer have a face. In our economic system, human beings are no longer called by their names. Instead, they appear as numbers, as files, as figures bracketed together. Now we ourselves know that line, which in past years led to the Nazi regime. When you give an individual a number you have no scruples later about sending him to the ovens of the crematoria.

There is also the problem posed today by cloning. The Biblical text says that humans are made in the image of God and that each individual is unique. Cloning is a violation of human dignity. It stems from the fear of change. It is a sign of fear and an expression of a total refusal of difference. It is a closing in on oneself to the point that one only wishes to

reproduce and replicate oneself. In the same vein I would like to say a word on eugenics. Are procedures such as in vitro fertilisation and other techniques of medically assisted procreation thoughtlessly seeking to break the transmission lines between generations, in that they tear a human being away from his first environment, the mother and the father? Are we not seeking to confuse origins and blot out the traces of a history not readily accepted?¹⁰

We have just left a century broken by the difficulties of transmission. There is not only the Shoah but also the fall of Marxism. What can those who were such firm believers pass on to their children? When there is a break in communication one can easily misrepresent the links of history and memory. Those who are ignorant of who their parents are and what happened, and who fail to know what their parents believed in and stood for, are tempted to mock the past and make themselves the reference point. They become 'superhumans.' All taboos are lifted. Everyone makes his own law. In that case, to use an expression of René Char, "our heritage is not preceded by any testament".

13.4. Humans, Partners of God

Should we for these reasons condemn science and scientific progress? Should we reject all technological progress in the name of religion? The answer is a definitive no and again no. The Torah has never closed the door to scientific progress; it has never advocated a flight to the desert and a sterile stagnation of research. On the contrary the Torah demands that we encourage and promote scientific progress. The development of science is seen as a source of light to reinforce faith. Great Jewish thinkers were men of science (Maimonides, Rabbi Yehuda Ha Levi, etc.). Maimonides wrote: "Knowledge is a grace which comes directly and personally from God, the sovereign of knowledge, and which commits the righteous to justice".¹¹ In the first chapter of the Bible God insists on this aspect. He commands humans to populate the earth and subdue it. He demands that humans subjugate the earth and transform and use freely the fruits and products of the earth. This is a formal law blessed by God. The spirit which humans have received should act as a lever to live more fully in faith and hope. All scientific advances are only corollaries of this commandment, which has made humans partners of God. It was not forbidden to touch the tree of knowledge. It was not forbidden to handle its fruit. What was forbidden was eating of the tree. What is it to eat? To eat is to refuse to accept that the other might live beside me. To eat is to engulf others – not to allow them to be at my side with their own personalities. When humans refuse otherness, when they only wish to eat the other, the result is the death of society. What is forbidden is not scientific research and scientific progress but the making of man into God. What is forbidden is to reject God and human values in order to profit personal interests. True knowledge of humans and their place in the universe is the only way to reconcile humans to God and humans to their neighbour.

- ¹ Born in Riga (Lithuania) in 1903, Leibovitz was one of the most important intellectuals in the Jewish community. After studying chemistry, medicine, philosophy, and theology, he held different chairs at the Hebrew University of Jerusalem and played a key role in the editing of the Hebrew encyclopaedia. He died in Jerusalem in 1994.
- ² Yeshayahou Leibovitz, *Sichot al Mada ve-Arachim (Conversation on Science and Values)*, Tel Aviv, 1985.
- ³ Prov. 1:7
- ⁴ Alexandru Safran, *Jewish ethics and Modernism*. Publ. Albin Michel, 1998. Safran, former Chief Rabbi of Romania, was the Chief Rabbi at Geneva, where he taught Jewish philosophy at the university.
- ⁵ Cf. Ps; Tanya III
- ⁶ Gen. 11:4. Rabbi Samson Raphael Hirsch comments on this verse: "This sentence reveals the true colours of the builders of the Tower. The consciousness of self can give rise to two possible reactions: humility or pride. Being aware of our own unimportance can stimulate us to make an effort to contribute to human progress. It can however also lead us to revolt against our inexorable destiny and leave us trying to transcend the limits of our humanity and move out of the framework which is oppressing us in an attempt to conquer the Divine. The men at Babel deliberately chose pride. They did not wish to subscribe to the idea that the individual was worth only what he contributed to society. Their building had no purpose. And God destroyed their perfectly useless tower. It was only a grotesque monument to an immeasurable pride which believed it could transcend the limits established for all eternity between God and Man. And God destroyed their vain project. He scattered them over the face of the earth and erected insurmountable barriers of languages and idioms; thus making it impossible for them to form an enduring alliance against Him in the future. Separated from each other, conscious of the vanity of their dreams of greatness, weak and obliged to depend on their own individual resources and deprived of the support of friendly nations the peoples re-discovered the road of patient and efficient use of human ingenuity, used for the greater good of all of humanity. Since Babel men have lost their unity. All their efforts are needed to keep their place with difficulty and to defend it against the jealousy of their neighbours. A world preoccupied with the material has taken shape, which although not reaching the degrees of perversion of the former one, vegetates painfully and no longer perceives the lights which will illuminate the future. The pure flame of the name of God will only flare up when Abraham, born of humble parents, in a pagan land, calls men to concentrate no longer on making a name for themselves, but to glorify the name of God. He will teach them charity and love and will become an everlasting symbol of the peace restored between man and God." S.R. Hirsch quoted by E. Munk, in *La voix de la Torah*. Paris: Fondation Odette S. Levy 1976, p. 114.
- ⁷ Cf. note 4.
- ⁸ Pirke de Rabbi Eliezer, 24; Bemidbar Rabba 22, 6.
- ⁹ Eliahou of Vilna (1720-1797), more usually known as Gaone (Genius) of Vilna was one of the most authoritative rabbinical scholars of the modern age. His knowledge of the Talmud and the Kabbalah was immense. His diligence in study was remarkable. He wrote few systematic works, but his disciples noted down his remarks on the Bible, the Talmud and the sacred writings. He was violently opposed to Hassidism because in his view the movement did not give enough importance to study. *L'Èvène Chelémah* reprinted in Jerusalem in 1960 contains diverse moral recommendations. It was published in 1961 with a commentary from Gaone of Vilnius on the Bible and Talmud, *Kol Eliahou*, and a special commentary on the Book of Job, *Dvar Eliahou*.
- ¹⁰ G. Bernheim, *Un rabbin dans la cité*, Paris: Calmann-Levy, 1997, p. 69-70
- ¹¹ *Guide des égarés*, Volume II, Paris, 1861 II, XII, p. 104 and XXXVII, p. 289

Chapter 14

DRAWING THE LINE AND EXPRESSING THE DILEMMA IN CORRECTIVE OR PLASTIC SURGERY

by *Anestis Keselopoulos*

DRAWING THE LINE AND EXPRESSING THE DILEMMA IN CORRECTIVE OR PLASTIC SURGERY

by **Prof. Anestis Keselopoulos**

The present chapter situates corrective and plastic surgeries in a theological framework by examining the underlying mindset of marketing, utilitarianism, and medicine. After distinguishing the strictly medical demands and therapeutic needs from psychological needs and social pressures, the historical development of reconstructive surgery is outlined and the prospects for gene therapy are sketched. A theological examination of the motivations behind these procedures reveals the presence of a desire for self-deification and autonomy, manifesting alienation from God.

Let me begin this contribution by stating the obvious: the Church rejects neither physicians, nor medicine, nor the achievements of medical science. Even in the Old Testament it is perfectly clear that medicine and physicians are quite acceptable: "Treat the doctor with the honour that is his due, in consideration of his services; for he too has been created by the Lord. Healing itself comes from the Most High, like a gift received from a king. The doctor's learning keeps his head high, and the great regard him with awe. The Lord has brought forth medicinal herbs from the ground, and no one sensible will despise them".¹

In today's secular society, however, modern humans go beyond accepting and respecting the sciences in general and medicine in particular: they have turned them into idols, subordinate to none. Theology offers another perspective, neither rejecting medicine, nor impeding its progress, but all the while remaining well aware of its relative status. In particular, corrective interventions in medicine, as in any other human endeavour, can be a blessing, if they are executed properly, but they can also degenerate to an affront of hubris against God, an insult to His will - and all in the name of human self-centredness and self-love.

For this reason, as a matter of introduction, we should make it clear from the outset that corrective interventions themselves are not as dangerous as the mindset that seeks to correct nature and to alter the physical and mental attributes of humans. And while the Church recognizes natural variations and differences in the body's strengths and the mind's capabilities, science and the coercive egalitarianism of the masses tend to make physical

characteristics into absolutes of such paramount significance that they rush to alter those characteristics either with so-called enhancements or by creating identical cloned copies. This mindset, rather than the possibilities of science, is the driving force beneath this state of affairs. As someone rightly put it, what matters is not whether people who undergo such scientific interventions and medical procedures will be improved or made better, but whether they can even continue to be considered human.

No one can deny that interventions applied to the body influence the soul to varying degrees according to the particular circumstances and that these influences have spiritual consequences. All of the issues and challenges of bioethics concern the approach of humans to life and death. Corrective and ameliorative procedures are no exceptions. Those who understand medicine as a human-centred and utilitarian science are not troubled when the broader accomplishments of technology alienate humans from God.

In particular, when we consider the subject of ameliorative medical procedures, especially cosmetic plastic surgery, we note that these procedures are promoted as completely normal by a smoothly organized marketing campaign of companies and individuals who have special economic interests in those companies. The end result is people undergoing such procedures without any reservations. One indication that this is in fact the state of affairs is the relatively limited bibliography on the subject. Here as elsewhere in bioethical matters, we encounter a vigorous attempt to guarantee post-modern man's human rights as well as an inability to avoid the narrowly eudemonistic criteria, which stem from utilitarianism.

Three Reasons to resort to Plastic Surgery

People usually decide to enter into the process of cosmetic and ameliorative surgical procedures on the basis of chiefly three related rationales: to overcome some type of sickness or handicap, to cope with personal psychological problems, or to respond to the prompting or even pressure from immediate family, friends or social surroundings. We are speaking about rationales, and not isolated reasons, because for each rationale we can distinguish a multitude of cases that have their own particular chain of reasoning and dynamics.

The first group consists of those who suffer from a disease or deformity on their face or body, which not only troubles them aesthetically, but also causes them problems in functioning. In this case the disease or illness could be a type of cancer or dermatological malady, while a deformity could be due to a genetic syndrome or an accident. In some of these situations, the cosmetic restoration occurs at the beginning of surgery, because of the risk of complications, which would require the person to have a second procedure. Sometimes, there is also an urgent need for immediate restoration and functioning of the

area of the body where the surgery is going to be performed.

We note that such cases do not create bioethical dilemmas, since they are primarily therapeutic and only secondarily ameliorative/cosmetic surgeries. Furthermore, in many of these cases the patients are left with very few possible choices, because the restoration of a bodily function cannot be completed without aesthetic alteration that they may also desire. Moreover, in these cases patients often do not have the luxury to think about the ethical implications of the surgical outcomes on a purely aesthetic level, since they have little knowledge about what is going to happen in the surgical process which is about to transpire. And, in the final analysis, they are going to be primarily interested and focused on the success of the surgical procedure and secondarily on the aesthetic result, rather than musing about what they will have to face post-surgically.

The second group of people who resort to cosmetic surgery do so for psychological reasons and problems. Until now, many believed that such psychological considerations only prompted women to consider surgery, but men also make similar decisions. In terms of age, the type of person that makes this choice includes not only the elderly and mature, but even teenagers. In these cases, aesthetic procedures are viewed as 'solutions' to regain lost self-confidence and self-esteem or even as a panacea that can renew the interest of a spouse, save a marriage, or attract the attention of a sexual partner. These interventions are considered to be an antidote for the changes in appearance brought by ageing, facial changes such as wrinkles, unattractive folds and skin discoloration as well as bodily changes such as fat, cellulite, the sagging of the breast or loss of muscle tone.

Today, it is not unusual for the elderly to turn to plastic surgeons and undergo various cosmetic procedures in an attempt to improve not only their outward appearance, but also to boost their depressed psychological state and morale. Although they try to appear younger with interventions such as facelifts and neck lifts, day-to-day life confirms what the texts of some ecclesiastical writers have unequivocally taught at length: all attempts are made in vain. It is also not unusual for overweight people from every age group to go to plastic surgeons on account of frustration over their body image and their desire to lose some extra weight. Many are convinced, no doubt falsely, that if the aesthetic appearance of their body improves, then anxiety, depression, and other psychological problems that torture them will automatically decrease or their social life will change. This tendency frequently results in a continuous and agonizing preoccupation with observing and caring for their bodies. Unfortunately, their desire for perfect proportions causes them to constantly uncover new imperfections.

Even more problematic members of this group are those who are dissatisfied with their gender and seek a sex change either through drugs or surgery. Psychiatry classifies this condition as a gender identity disorder, which is more generally known as 'transsexualism'.

There is not a scientific consensus on the causes of this disorder that appears more frequently in men than in women. Some assert that it is due to a hormonal imbalance that develops in the embryonic stage, while others identify it with psychological causes in parent-child relationships. In a large number of them there are symptoms of depression which cause many suicides. When they go to a psychiatrist they are offered supportive psychotherapy, provided that their problem is noticed. As such, it is important to underscore that aside from the major bioethical problems that these cases raise, gender modification poses a serious danger to the health of these people.

In the third category of people who turn to plastic surgeons are those who are pressured against their will into surgery by their familial, workplace or broader social environment. They have plastic surgery under the weight of psychological distress caused by the characterizations and name-calling of others, because they cannot deal with their pain in a spiritual way, and in any other way, and ultimately resort to plastic surgery. Those who experience rejection because of their external appearance when searching for work face the same problem. This problem does not only exist in those areas of work, such as the media and acting, where external appearance is considered to be an important qualification, but it also in the broader workplace where it can cost people a position or affect their career.

Theological and Bioethical Comments

When we speak about ameliorative interventions we are referring to a broad spectrum of cases. For methodological clarity, we will distinguish three categories. The first concerns aesthetic procedures and the various types of reconstructive surgeries, face transplants, cosmetic surgery, non-surgical procedures as well as sex change operations. The second category concerns cosmetic neurology; the third category concerns those ameliorative procedures that are done to the human genome. This final category includes genetic therapy to the bodily cells, that is, the so-called altering-ameliorative genetic therapy and eugenic genetic intervention.

For the sake of brevity, we will not discuss these categories in detail. What we will do, is to briefly sketch the primary reasons behind the most common ameliorative interventions, and then examine some theological issues, which we hope will lead to some fruitful dialogue at this conference.

Plastic surgery, reconstructive and cosmetic, began as a response to the pressing need for the recovery of those who were disfigured and maimed during the two world wars of the twentieth century. In time, plastic surgery evolved from a form of rehabilitative therapy into a commodity in the beauty industry. And although it was initially available only to the rich and famous, because of the prohibitively high costs, it was not slow to enter into

the lives of others who belonged to the lower socio-economic classes. As the years went by, the way people looked at these types of procedures changed. In the beginning both doctors and patients felt the need to keep the procedures a secret. Today, some even advertise the fact that they have had them. Furthermore, while in the early days, these procedures were devised to respond therapeutically to disability and birth defects, they quickly began to be used for other ends such as vanity and hedonism.

Reconstructive surgery is performed on people who have birth defects such as conjoined or missing fingers, cleft palate, or are born with Crouzon syndrome or Apert syndrome. These surgeries are also performed on those with postnatal problems acquired over the course of their lives from burns, accidents, infections, and other illnesses. In either case, these surgeries are deemed necessary because they have a therapeutic character and correct deformations that hinder the individual from functioning normally. This is also the reason why such surgeries are usually covered by medical insurances.

This fact makes those types of surgery different from a bioethical perspective in comparison to cosmetic surgeries, which are concerned with outward appearance, rather than improved health. The first type of plastic surgery is conducted on the sick, whereas the second type is conducted on the healthy. From a bioethical perspective, the same reservations stand for non-surgical cosmetic procedures such as botox, the most popular cosmetic procedure for which women and men in America and other 'civilized' countries spend enormous amounts of money. Moreover, sexchanges are approached from the same perspective, a mindset that persistently advances the argument of autonomy and the belief that the individual has every right to intervene in his own life and do whatever he desires. With such a mindset, people even construe these types of procedures as being corrective, because they are purportedly conducted in order to 'correct' God's mistake.

Similar improvements are also promised by cosmetic neurology. If plastic surgeries aim at the improvement of external appearance, in the case of cosmetic neurology, people seek to improve and strengthen mental capabilities. And again we encounter a similar historical development. Early on, with the help of pharmaceutical products, physicians provided treatment for illnesses such as Alzheimer's, Parkinson's as well as chronic and migraine headaches. However, over time, these treatments began to be offered to healthy people who wanted to 'improve' their mental faculties and thus become a 'better' person with higher intelligence, a stronger or more selective memory and more powerful reflexes. In this area, new and revolutionary pharmaceuticals risk altering the person's desires or emotional state in unknown ways. Living in an age of deteriorating morality in which depression, insecurity, and obsessions deprive life of meaning, utilitarian humans of the 21st century will accept cosmetic neurology as a lifesaver that the market will further justify for commercial reasons.

In regard to ameliorative genetic procedures, we will here leave aside the subject of the array of genome treatments for therapy and concentrate on the use of this technology for modifications or ameliorative purposes. When gene therapy is performed on the body's non-reproductive cells, we know that the therapy has a strictly corrective character and therefore raises fewer ethical dilemmas. Such therapy concerns those illnesses that attack a certain gene, which subsequently causes the body to function improperly. An example of this type of illness is Mediterranean B-type anaemia. When the sick cell is replaced by healthy cells, normal functioning can be restored.

Of course, gene therapy on reproductive cells implanted during the embryonic stage can have quite different repercussions. This type of therapy not only affects heredity being potentially transferable to the patient's descendants, but also causes permanent genetic modification in all of the patient's cells. It is possible for other illnesses to be treated, because the responsible genes cannot be diagnosed during genetic testing.

Finally, among the gene therapies, genetic modification and ameliorative gene therapy raise the majority of bioethical dilemmas that we will now discuss. We are referring to interventions that seek to transmit some type of desired characteristic to an organism through genetic modification. With such an aim, calling it therapy is a misnomer. Although it utilizes nearly the same methods as the previously mentioned gene therapies, its ultimate goals are quite different. In this case, not satisfied with decoding the genome, pride drives humans to presumptuously make adjustments to the works of God. And after 'successful' procedures on plants and animals, humans turned their interest to themselves. Successful is in quotes, because genetically modified plants and animals for the sake of profit may provide us with less perishable and more attractive animal and plant products, but they are far inferior in quality and taste.

Unfortunately, we have not learned from this experience and are continuing on the same course, but now with human beings. Although potential applications for genetic engineering to improve human characteristics are not yet feasible, in the future such applications can be classified as physical, intellectual, and psychological, depending on the object of 'improvement.' In terms of aims, many would like to be able to regulate measurable human characteristics such as height and weight, to prolong biological life, and to alter mental capacities like memory, to reduce the need for sleep, and to increase physical stamina. In other words, it is not a matter of treating illness, but rather of action on the basis of cosmetic criteria. It would not be off the mark to refer to such interventions with the term 'genetic plastic surgery.'

Bioethical reservations about these procedures are not based on the notion that the desire for human beauty is blameworthy, but on the uncertain safety of such procedures and

their potentially dangerous results. Frequent side effects and infections, which many times even lead to death, are not insignificant details that we can brush aside untroubled by such consequences. Furthermore, we cannot fail to notice the significant fact that carefully-designed businesses promote these procedures by exploiting the vanity of many people. These businesses inevitably promote and launch new products into the market that are packaged as new 'improvements.' In these cases, we encounter impermissible repercussions such as the commercialization of medical procedures and the utilitarian transformation of patients into customers.

Moreover, when people consider some of these methods to be 'innocent' or 'harmless,' they dangerously lay the groundwork for unsettling situations. For example, serious bioethical problems arise from the widespread procedure of botox in both the US and the rest of the world. Botox is not surgery, but rather an injected form of toxin that smoothes wrinkles and makes them disappear temporarily. This apparently innocent procedure can have catastrophic consequences in the future for the health of certain people, since continuous use can potentially create antibodies in a person's immune system, which in turn makes the drug increasingly ineffective. So, if we suppose that at some point botox is proven to be an appropriate treatment for a serious illness like Parkinson's, previous frequent botox users for cosmetic purposes will be given ineffective treatment because their bodies have got used to it.

In general, the bioethical dilemmas surrounding cosmetic plastic surgeries focus primarily on the reasons behind these procedures. As a universal rule in Christian ethics, what really is significant is not the outcome of an action, but the motivations that lead to it. In this light, we must also view cosmetic surgeries. In Orthodox Christian theology and pastoral care there is clear priority given to the human person. It is not the person's action in the abstract that is being judged, but rather the specific moral agent. Moreover, when we think about the fact that many of our fellow human beings live miserably on the edge of poverty lacking even the most basic goods for their survival, the amount of money spent on many of these procedures is also no insignificant point.

Similar issues and problems arise with cosmetic neurology. Is the user's safety compromised by possible side effects? Will his character or personality be altered? Will economic constraints encourage access to these procedures by unjust means? Will promotion and advertising of these procedures involve direct and indirect coercion? Questions such as these call for objections from those in the field of bioethics. Even further, when what some subjectively consider to be a sickness or a problem in need of improvement has not objectively been proven to be so, the dangers surrounding what society ultimately dubs a necessary improvement are dire indeed.

Finally, bioethics should harbour equally strong reservations and rising concerns about genome modification and improvement to human psychological traits and ethical characteristics. Given that genome interventions can influence morals, character, and behaviour, I do not believe that anyone can deny that humans are faced with the problem of free choice and the potential loss of human responsibility for their actions. Even if these genetic engineering interventions are still beyond the reach of humans, the modification of human nature is a subject that provokes justifiable reservations and concerns. From the perspective of Christian ethics, ameliorative medical interventions represent a futile attempt to improve our physical and mental characteristics. But what is worse, from a bioethical perspective, it is an attempt at self-deification that simultaneously expels God from human life.

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¹ Wisdom of Sirach 38: 1-4.



Chapter 15

THE ENHANCED HUMAN? ETHICAL ASSESSMENTS AND IMPLICIT IMAGES OF HUMANHOOD FROM A THEOLOGICAL PERSPECTIVE

by Ulrich H.J. Körtner

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Behind all medical and bioethical questions from stem cell research to converging technologies – that is the combination of nano-, bio-, information- and cognitive sciences – the question of the image of man and man's place in the cosmos, which can act as a guide, arises. Nowadays anthropology is no longer merely reconstruction, but also construction of the human being. Statements on the alleged essence of the human or of nature in general, are replaced by projects and projections concerning the changeability of being. The debate on enhancement mostly concerns questions of personal identity, self-esteem, and various forms of the self – the private, public, and collective self. This is why we can expect important contributions to the debate about enhancement from psychology. However, the problem of the self and self-esteem is also a decidedly theological topic which leads directly into the centre of Christian hamartiology. Now the task of the human being is always to conduct one's life between the poles of freedom and fate. In more concrete terms, this means seeing one's body as a gift and a task at the same time. Theologically speaking, the question is, in which cases enhancement complies with the polarity of freedom and fate which is in accordance with the Creation, and in which cases enhancement is a form of sinful despair (Kierkegaard), of the desperate wish to stay the way one is – and thus to resist the polarity of form and dynamics, or of the desperate wish to be somebody else. In these cases, enhancement does not offer a way out of despair, but only leads further into it.

15.1. From Homo Faber to Homo Fabricatus

'Homo faber' is the name of a novel by Max Frisch that was published in 1962. The hero of the book is a technical engineer whose rationalist worldview is thrown out of joint due to tragic entanglements. Other characters in 20th century novels were also engineers, for example Ulrich, the *Man without Qualities* in Robert Musil's novel of the same name. Engineers are considered the epitome of modernity. Apart from literature, 20th century philosophy also dealt with the character of modern technology. Martin Heidegger's critique of technology is particularly radical. Heidegger analysed the calculating character and the violence of modern technology concerning the handling of nature and its consequences for the self-conception of the human being.

Another developmental step is marked by genetic engineering. 'Life sciences' is the name of the bioscientific-technical complex of the 21st century that reaches from agriculture to molecular medicine. Biotechnology leads to new, profound challenges to our worldview and anthropology. *Homo faber* becomes a *homo fabricatus*. Loosely adapted from Karl Marx, the philosophers and theologians have merely interpreted human beings differently in the past. The new biosciences, however, are all about changing them.

Earlier eras also assumed that humans are changeable and in need of change. On the one hand, humans were regarded as part of the microcosm that depicted the ultimate perfection of the macrocosm. On the other hand, earlier eras also knew about the misery of human beings, their physical vulnerability, and their moral imperfection. The great religions are convinced that a human being is not only in need of healing, but also of salvation. Next to the hope for salvation, the optimisation of the spirit and the body is one of the ancient dreams – and nightmares – of humankind. To accomplish this, past eras used to rely on upbringing and education, on religion and morals, or – after the Enlightenment – on politics and social techniques. Before, the contemporary bio- or life sciences used to be ethics, understood as a theory of the human conduct of life. Instead of these, modern 'life sciences' include biology, bio-chemistry, and molecular medicine.

New human factors and technologies rely on the technical manipulation of the human body and its biological consistency – right up unto its smallest components: cells, genes and molecules. The body and the human spirit (*psyche*) become objects of biotechnological interventions. From a neurobiological point of view, the spirit is a system property of the brain. The connection of genetics and genomics to neurobiology, the information sciences and nanotechnology inspires visions of new kinds of interventions in the human brain, be it in order to heal psychological or neurological illnesses, or to optimize intelligence and cognitive performance.

Behind all these medical and bioethical questions that reach from stem cell research to converging technologies¹ – that is the combination of nano-, bio-, information- and cognitive sciences –, the question arises of the image of humans and their place in the cosmos, which can act as a guide. There is no unanimous answer concerning the question what a human being is. The ethical conceptions are as different as the various anthropologies were and are in past and present.

Stereotypical talk of *the* image of man, for example, the Christian image of humanhood, is of course an unhistorical construct. There is no such thing as *the* Christian, or *the* Humanist image of humanhood, at least in this form. Moreover, both are subject to historical transformation processes. These processes are, among other things, the results of the

Enlightenment together with the results and advances of the modern sciences and the humanities, as well as changes in society, such as the transition from an agricultural to an industrial society, and then further to a post-industrial service and information society.

Furthermore, the different Christian denominations vary in their approach to dogmatic and anthropological questions concerning, for example, the concept of nature, the understanding of human freedom, and the concept of sin. This points towards the fact that, in ethical questions, answers of Churches and of individual Christians can vary. The Christian view of humanhood thus shows a degree of plurality, which even, to some extent, crosses denominational boundaries. In this sense, it seems more appropriate to speak of Christian images of humanhood, rather than of *the* Christian image of humanhood.

Images of man are the result of complex processes of cultural and religious hermeneutics. Thus, the question is posed in a one-sided way if it only asks how long technological progress will (still) be compatible with a certain image of humanhood. At the same time we need to ask to what extent an ideological or religious tradition can manage to process historical changes in a productive way, and to reinterpret outdated elements of tradition so that they allow present day humans to interpret their own existence in a meaningful way. Without doubt, a specific anthropology always has a critical function regarding ethics. *Critique and hermeneutics are, however, dialectically interrelated.*² That does not mean that we should let technological progress go unchallenged. Instead, the focus should be on the ambivalences of this epochal process between the poles of hermeneutics and critique.

The question of the critique of technology is: where are the boundaries of the ethically justifiable, beyond which the use of science and technology leads to inhumanity? *The hermeneutical* issue of technology, then, is: what happens to a human being's self-conception if she has to understand herself as a technically generated product of fellow members of her species? How can the concept of human dignity be charged with meaning and sense under these circumstances? Put differently: what is the Judeo-Christian tradition's concept of the image of God supposed to mean? Will the human being – in, with, and under the related technological circumstances which accompany her becoming-human – still arrive at a personal faith that God ultimately created her 'and all creatures' (Martin Luther)?

If a truth claim can still be made for biblical creation faith, it must, nevertheless, still be valid under the conditions of contemporary biomedicine. If the conviction that the human being reflects the image of God is to be rejected as a result of the use of certain reproductive technologies, then the story of the creation is also an obsolete myth.³ If however – in the talk of creatureliness and the image of God in humans –, utterance is given to an understanding of existence accessible to faith, then the language of creatureliness and the image of God must also remain a possibility for human self-interpretation in the present.

The distinction between instrumental knowledge and orientational knowledge may be helpful in this regard. Our conduct of life and our actions do not find basic orientation in abstract principles but in meaningful stories, metaphors, and symbols. Belief in creation and the certainty of one's own creatureliness are also located at this level.

15.2. Ethics as Applied Anthropology?

The protestant theologian Wolfgang Trillhaas was of the opinion that all ethics is 'in every sense, applied anthropology'.⁴ However, the concept of application is just as ambiguous as the conventional concept of applied ethics. It gives rise to the impression that it merely has to do with casuistically applying an established idea of the human to practical problems of conduct. Who or what is applied here by whom to what? Who is the subject of the application? To whom is it addressed? And does 'applied anthropology' mean that anthropological reflection goes before action, or does it mean retroactively giving an account of our morally-based decisions?

The idea of an applied ethics is subject to similar difficulties. For example, it is unclear what precisely is applied in so-called applied ethics: principles, criteria and norms or models, paradigms, examples and experiences, and thus, what is generally called 'topic,' i.e. the teaching from platitudes or typical situations. If applied ethics is understood in terms of topic, it nevertheless does not bespeak the application of an ethical theory. There is a discrepancy between theoretical ethics and applied ethics.⁵

The aims and objects of medical ethics, for example, are more felicitously characterized by the concept of area ethics (introduced by Julian Nida-Rümelin) than by applied ethics.⁶ Area ethics presupposes that differing fields of practice "confront us with different kinds of problems, which require different kinds of ethical reflection."⁷ Economic ethics, legal ethics, political ethics, ethics of science, media ethics, bioethics and medical ethics are the most important examples for area ethics. Just as the goal of ethical reflection cannot be about assimilating ethics or morality to the presumed 'practical constraints' of the different areas of praxis, so also it cannot consist in "codifying and fixing the moral *status quo*. Rather, ethical reflection is compelled to critically examine the moral standards of the traditional ethos, and to investigate their effects on individual and societal praxis."⁸

The same goes for anthropology. What the human being is, what he or she can, should, or wants to be, is not determined in advance. It must be spelled out anew, again and again, in all ethical conflicts over medical and technical innovation, as well as in political and societal developments and upheavals.

According to Immanuel Kant, there are three basic questions with which human persons are concerned: what can I know? What ought I to do? What may I hope? According

to Kant, these three questions lead to a fourth and final question: what is the human? Yet Kant's basic questions – in view of rapid technological progress and the economic, political, and social revolutions which follow in its train – are in danger of disappearing from view. Confused, we latecomers of modernity (as philosopher Hans Blumenberg puts it) are asking: "But what was it we wanted to know?" We are just as perplexed when it comes to answering Kant's question concerning right acts and omissions, as well as a reasonable hope and a humane future.

We find the question concerning the being-human of the human person even more difficult to answer. Controversial today, is not only what the human being is, but also who is a human being. That is, the questions as to whether a distinction can, or even must be made between the human organism and the person, questions about when the life of a human individual begins and ends, how it may be medically and technically altered, and whether biological boundaries between living species or between animate and inanimate matter are merely technical, or whether they mark off moral and ethical boundaries as well.

In his novel, *Self-portrait with Turban*, the Dutch writer Harry Mulisch answered the question of what the human is in an unusual way: "The answer is: 'What is the human?'" The question about what the human being is in reality the answer, 'for the human being is not an answer, but a question'.

Anthropology enquires into the question as to what the human is. Indeed, the philosopher Ludwig Wittgenstein pointed out that in case of an answer which one cannot utter, the question must remain likewise unutterable. How, therefore, can we understand the human being as a question if we do not know the answer to this question? Theology enquires into the answer, to which the human being is the question. The religious symbol for this answer is the word 'God.' Nevertheless, the answer to which the word 'God' points, does not settle the question of what the human being is; rather, it constantly provokes it in new ways. How this occurs is one of the themes of theological anthropology.

As well as so-called moral values, it is ultimately also basic religious convictions which are disputed in the confrontation concerning the introduction of new biotechnological and medical techniques, their regulation and political supervision. The open or latent religious hopes and claims to validity, which play a role in technological advancement, are in need of critical reworking. This is not exclusive to philosophy, nor to religious studies which understands itself as cultural studies. It continues to be the business of theology as well.

15.3. Image and Construction

One of the main difficulties concerning the discourse of bioethics and biopolitics in modern, pluralist society is that neither a generally binding religious orientation, nor a universally valid basic metaphysical orientation can be presumed. With great foresight Pannenberg stated four decades ago: "When it comes to general awareness, the sciences concerning themselves with humans are well on their way to taking the place that metaphysics had in former centuries"⁹ In so far as these sciences not only analyse and interpret the humanity of the human being, but also change it, the character of anthropology also changes. Anthropology is no longer merely reconstruction, it is also construction of the human being. Statements concerning the alleged essence of the human, or of nature in general, are replaced by projects and projections concerning the changeability of being.

Part of being human is the desire not only to understand one's own life, but also to draft, to design it. The philosopher Martin Heidegger declared design to be an existential of the human being.¹⁰ In the age of bio- and human engineering, the word 'life design' has an entirely new ring to it. It now means the technical design, according to which life can be shaped, planned, and changed.

Every anthropology aims to design an image of humanhood that is equal to ourselves. From times immemorial, self-knowledge has counted as the highest kind of knowledge. According to a classical definition, truth is the *adequatio intellectus et rei*, i.e. the correspondence of statement and fact. Their consonance can be achieved in two ways: either by adapting a statement or theory to reality, or by changing reality with reference to an image of it.

Accordingly, the term 'image of humanhood' is ambiguous. Just like the images that humans draw of themselves, images of humanhood that describe an anthropology based on science, philosophy, cultural science or theology are not mere copies of the human being, its nature and its essence. Every image of humanhood has the character of a draft. Images are constructs which do not simply reflect reality, but actively influence and change this reality. It must be proven anew in each case how far the image that we (or others) have of ourselves is an image that is true to reality, or one that corresponds to an ideal, a wish or a distorted perception. Furthermore, self-description and the description by others need not necessarily coincide.

Provided that the image of humanhood correlates with new forms of human engineering and an advancing medicalisation of human life, the difference between self-description and description by others is substantial. The debate on enhancement mostly concerns questions of personal identity, self-esteem, and various forms of the self – i.e. private,

public and collective forms. This is why we can expect important contributions to the debate about enhancement from psychology.

However, the problem of the self and self-esteem is also a decidedly theological topic which leads directly into the centre of Christian hamartiology. According to Søren Kierkegaard, sin is essentially to despair.¹¹ The Danish philosopher distinguishes between three forms of despair, namely the desperate wish to be oneself, the desperate wish not to be oneself, and vapidity as an expression of deepest resignation and self-abandonment. The different kinds of medical enhancement largely concern these forms of despair. Think, for example, of the field of nutrition and all kinds of diets, of obesity and anorexia, of plastic surgery and mood-elevating psychotropic drugs.

Now the task of the human being is always to conduct his or her life between the poles of freedom and fate.¹² In more concrete terms, this means seeing one's body as a gift and a task at the same time. Theologically speaking, the question concerns those cases, in which enhancement complies with the polarity of freedom and fate which is in accordance with Creation, and those cases in which enhancement is a form of sinful despair, of the desperate wish to remain the same (and thus to resist the polarity of form and dynamics)¹³, or of the desperate wish to be somebody else. In these cases, enhancement does not offer a way out of despair, but only deepens it.

Concerning society and politics we must also ask who the subjects or institutions are who design the new images of humanhood and try to implement them. In the course of this, do humans want to have themselves at their disposal – or others, whom they would shape according to their own image and their own wishful thinking? And who gives human beings the right to have others, including even the unborn, at their disposal in this way? Are all attempts or fantasies to optimize human nature covered by the principle of autonomy? Or does self-determination, together with the reproductive autonomy which is proclaimed nowadays, not change into a scarcely bearable heteronomy for those who are objects of such manipulations? Where are the lines that demarcate the ethically legitimate wish to be healed from the unethical wish to breed humans?

In general, the health system is developing into a multi-optional association. Where are the socially acceptable boundaries of patient autonomy? Next to the right to be cured, is there a right to optimize one's nature, for example, one's cognitive performance or visual function? Are the reversibility and irreversibility of medical interventions which are discussed under the heading of 'enhancement' ethically relevant criteria? And what of the distinction between interventions that affect only the individual concerned and those that – as is the case, for example, with germ line therapy – affect next generations and might even effect a fundamental change in the human species?

The transition between therapy and non-therapeutic interventions in the field of so-called neurological enhancement, as well as in other areas of medicine, is a fluid one. A further question which remains open is who determines the boundaries in individual cases. Deciding and negotiating which conditions and states of health fall into the category of disease, and which do not, is becoming increasingly difficult. Problems of definition are caused not only by the concept of enhancement, but also by that of medical indication.¹⁴

15.4. Ethics and Technology

Any science ethics must gain an overview of the fundamental connection between technology and modern science.¹⁵ The philosopher Helmut Plessner referred to the human form of existence, determined as it is by technology, as natural artificiality. The converging technologies, i.e. the combination of nano, bio, information, and cognition sciences lift natural artificiality to a new stage of development. Nature is invariably a conceptual and epistemological construct. The linguistic sign 'nature' always wins its meaning in different scientific and cultural practices of interpretation. Also, in the course of the history of technology, nature has increasingly become a technical construction. The telos of nature has increasingly turned from a supposed self-will toward a sense of human action. Reflecting upon elementary questions of the image of humanhood and the image of the world or worldview – in German '*Menschenbild*' and '*Weltbild*' –, that is to say, the discussion of the essence of modern technology and the perspective on life that it determines, must therefore precede any individual question of material ethics.

The position of human beings in nature is characterised by their technical processes, which differ significantly from animal behaviour. Human technology is not confined to the use of certain tools which can also be observed among animals. Rather, human use of tools takes place because of aims and methods that implement the concept of causality in an organised way.¹⁶ Even if the being human of the human person is not realised merely by having technology, "the human being is a human being in its exceptional position, by having technology. Therefore, technology is a constitutive, an essential or epistemological determination of the human being".¹⁷ Any ethics of science or bioethics has to keep this factor in mind.

According to Martin Heidegger, the essence of technology has determined modern science from the beginning.¹⁸ Modern technology does not follow science as a mere application, but is already present in its roots. The scientific experiment uses technical devices, by means of which nature is adjusted in such a way that nature can be measured with precision. The famous dictum of Galileo Galilei reminds us that modern science is comprised of measuring that which is measurable, and making measurable that which is not measurable. The calculating eye on nature, which also means the mathematisation of

the natural sciences (which Logical Positivism, for example, declares as the measure of all science), is only enabled by technology and technical progress.¹⁹

Because the character of modern technology defines modern science in all its disciplines, the debate on ethics in the sciences is to a great extent concentrated on questions of 'technology ethics'.²⁰ This term has two meanings. On the one hand, it signifies an ethics *for* technology that aims at assessing the consequences of technology. In this sense, technology ethics is a form of applied ethics or area ethics. On the other hand, on a more basic level, technology ethics can be perceived as an ethics that is *rooted* in the essence or nature of technology. Technology ethics in this sense is not concerned with external moral or ethical norms of technology, but discusses "the possibility of an internal rationale of morality from the essence or character of technology."²¹

On closer inspection, one is confronted with a vexing dilemma. In the call for a renewal of ethics, or even a new ethics, the protest against technological rationality registers a general malaise of civilisation and its discontents (Sigmund Freud). However, part and parcel of the 'Dialectics of Enlightenment' is that it has made the ascendancy of technology complete, and more particularly that technology which first led to the greater part of the ethical conflicts for which solutions are so urgently sought after today.²² Among contemporary theologians it was Michael Trowitzsch in particular who – in an intense and passionate conversation with Martin Heidegger on the one side and Karl Barth on the other – pointed out the technocracy in the Era of Modernity, as well as the calculating intellect that shapes it.²³ Wittily, he worked out how the technocratic and, in its consequences, nihilistic will to power takes possession of the ethics which is deployed against it. To a great extent, the ethical search for pragmatic solutions to technocratic problems and conflicts bares the features technical rationality.

The question is whether or not theology is able to perceive the conflict of interpretations, to which the phenomenon of the ethical is subject, only as a crisis or also as an opportunity for reconsidering its own position. Martin Honecker asks whether ethics is to be based on rationality alone, or whether it also needs "the enlightening power of love, which is not a product of rational calculation, and the encouraging power of hope and trust, of faith that transcends the available".²⁴ The *aporiae* of the ethical in the conflict of interpretations give occasion to think about dimensions of life "which the human being, of itself, is not able to actively produce, but which it can only grasp and understand in the form of promise and offer".²⁵

Religious as well as secular bioethics can be understood as an attempt to 'moralise human nature'. As Wolfgang van den Daele puts it: "That which has become technically accessible because of science, should become normatively inaccessible again through moral control".²⁶

On closer consideration, the confusing ambiguity of the concepts of 'nature' and 'life' becomes visible. To make matters more complicated, the concept of life, as with that of nature, is often loaded with a religious meaning. Even Jürgen Habermas, who decidedly wants to keep his distance from a religious perspective, takes the view that "in order for a person to feel at one with his body, the person needs to experience it as naturally grown – as the extension of the organic, self-regenerative life out of which the person was born."²⁷

The religious idealisation of self-regenerative life is also a danger for Christian ethics. Insofar as it gets caught in the nonreflective use of the word 'life,' it is in danger of being confused with a religious incubator for all kinds of conventional wisdom. In fact, the belief that all life as such is holy, as is repeatedly claimed, only sounds like an extreme radicalisation of ethics at first, whereas in actual fact it leads to its abolition. "Where all is holy, nothing is holy anymore."²⁸

"Relying on 'ethics,'" Michael Trowitzsch judges, "liberates from technology's orbit of feasibility just as little as does wanting to retrieve 'religion'."²⁹ Rather than unreflectively religiously reinforcing Habermas' proposal of the moralisation of human nature, the essential task of theology consists, conversely, in a confrontation and critique of ideology, aimed at the societal and ecclesiastical tendency toward resacralisation of human nature. That is, to put it more precisely, of the personal existence and life-(hi)story of initially abstracted forms of human life. In vitro fertilized embryos are examples of such a technically abstracted form of human life. Whether they have the same ontological and moral status as embryos in uterus, or already born persons, is philosophically and theologically contentious. As a general rule, governmental law establishes the distinctions here.³⁰

15.5. The Controversy of God and the Controversy of the Human

According to the provocative thesis of philosopher Franz Josef Wetz, "human dignity is violable."³¹ When one thinks about the raging controversies concerning the opportunities and limits of biomedicine, he appears to be right.³² Despite its recognized significance, being based on human rights which are founded upon human dignity, the value and concept of human dignity (itself) is becoming increasingly less self-evident. Who qualifies as 'human,' as defined by human rights, and when a human life begins and ceases to qualify as deserving protection, is a topic of debate. This is true even of a country such as Germany, in whose constitution the inviolability of human dignity is more sturdily anchored than in most other Western democracies.

Granted that the idea of human dignity viewed historically and systematically, is not exclusively derived from the Christian perspective on humanity, the Christian perspective is, nevertheless, one of the important roots of this concept. This, precisely, is what makes

the idea of human dignity suspicious in the eyes of certain philosophical orientations. The appeal to human dignity is occasionally dismissed as mere rhetoric, and its Christian rationale as religious particularism.

Some years ago, James D. Watson who, together with Francis Crick, discovered the structure of the chromosome in 1953, and thus laid the foundations for genetic engineering, designated the Christian perspective on humanity as disruptive for research. He declared that the appeal to a creator God and his commandments justifies unnecessary suffering, which could be avoided today through genetic engineering and eugenics.³³ The philosopher Ronald Dworkin considers anxiety with regard to the possible abuses of eugenic genetic engineering to be understandable. Nevertheless, in his opinion, the only alternative is “unaccountable cowardice in the face of the unknown”.³⁴ In the sense of a balancing of competing interests, the possible risk of abuse could be balanced out by the hope that the number of genetic defects and deformities could be decreased, and possibly that desirable characteristics, such as intelligence, could be increased.

It would be misguided to express moral indignation about ‘superhumanism’ and ‘transhumanism’ without providing counterarguments. Likewise, a hasty retreat to the uncontested territory of Christian faith would be theologically fatal. In the ethical discourse of a pluralistic society, it is not enough simply to declaim religious certainties in the style of decisionist confessions. Indeed, there may be no final rational justification for faith. Yet, in many cases faith can provide reasonable arguments.

There is no need for special theological justification in order to see through the groundless, reductionist view of humanity which, for example, is sometimes derived from the findings of molecular biology. The question as to what the human being is cannot be answered in a purely biological manner. The answer, namely, that what is at issue is the animal rationale, defines the human being as an animal, and reduces the essence of the human being to a *differentia specifica*, distinct from other *animal genera*. One thing, however, is clear: the contentions surrounding the human being are not solely interesting questions for a philosophical post-graduate seminar. Differing determinations of the human being decide, in the end, upon the human being’s right to exist.

Thus, the question of the idea of the human does not only have to do with determining the essence of the human being. Ultimately, anthropology is always in search of grounds upon which it can justify the existence of humanity. When a human person is not able to justify herself or her right to exist – e.g. because she is not yet born, because he is severely mentally disabled, because she is lying in a coma – who or what justifies her right to life? The answer provided by the Christian reformed tradition is as follows: God justifies the life of each and every human being. The human being is the human being justified by God,

and for this reason does not need to justify himself or his existence. This is the main point which protestant churches bring to the ecumenical conversation concerning the Christian perspective on humanity.

Yet, the specifically protestant perspective on humanity is just as contentious as the Christian perspective is in general. The radicality with which the protestant tradition speaks of the justification of the sinner solely by grace through faith corresponds to the radicality of its view of sin. 'Radical evil' (Immanuel Kant) is seen in such a radical way that it is maintained of the justified sinner that he is righteous and sinful at the same time – *simul iustus et peccator*. To this day, Martin Luther's paradoxical and irksome formulation has lost none of its offensiveness. And it is not only a post-enlightenment, modern sensibility which has difficulties with this anthropology. Luther's radical statements also cause difficulties for mutual understanding in the ecumenical conversation. Whether or not it is merely a difference of language, or indeed an insurmountable difference of theological foundations which is at issue in the way the various confessions talk about sin and its continuing reality in the lives of the faithful, remains an open question. This was demonstrated in the discussions of '*simul iustus et peccator*' in the context of the *Joint Declaration on the Doctrine of Justification* of the Lutheran World Federation and the Roman Catholic Church. They showed that '*simul iustus et peccator*' continues to cause disagreement.³⁵

The contentions concerning the human being and the contentiousness of a theologically appropriate anthropology ultimately point to the contentiousness of God. God's existence, goodness, and righteousness are all contested. Herein consists the problem of theodicy. As a 'science of conflict',³⁶ theology considers the inner connection which exists between the contentiousness of God and the contentiousness of the human.³⁷ However, the interface of the contentiousness of the human with the contentiousness of God comes most clearly into view in the suffering and death of Jesus Christ who, according to the biblical witness, is the incarnate Word of God. Owing to the way in which God and humans are reciprocally tied together – even in the contradiction of human sin – the protestant tradition emphasizes the connection between the doctrine of justification of sinners by faith alone, and the theodicy problem. Accordingly, the justification of sinners by faith alone is, at the same time, to be thought of as the self-justification of God. For it is not only the human person who accuses God, but rather the existence of the sinful human, capable of malice, which raises the question of the righteousness of God. This concerns not only other people, but rather myself! It is, concretely, *my* existence and *my* actions which can become an objection for others, and allow for doubts about the righteousness and the existence of God.

In Christian faith, the saying above the entrance to the oracle of Delphi, 'gnothi seauton – know yourself!' is modified to 'know yourself – before God!' By this is meant, not an

ab-stract, but rather a concrete and accordingly existential self-knowledge and knowledge of God. Thus, Luther writes in his exegesis of Psalm 51: "The proper object of theology is the man who is guilty of sin and is lost (*homo reus et perditus*), and the God who justifies and saves the sinner (*Deus iustificans vel salvator*)".³⁸ Thus, according to Luther, it is first at the event of justification that a person comes to full selfknowledge and knowledge of God. Only one who recognizes herself as a justified sinner – that is, as one in need of forgiveness and indeed as having received forgiveness – grasps the essence of God, which is gratuitous love. From this vantage point, the world also is opened to the person as God's good creation, the knowledge of which is darkened by the power of sin, or distorted by unbelief.

In the first of the two Old Testament accounts of creation it is God who says: "Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth".³⁹ It is the biblical God who forms humans after *his* image, and precisely therein consists the inviolable dignity of the human being. The creation-myth guides the reader to see the world and himself with God's eyes.

Then, the question as to what humans are takes a surprising turn. In Psalm 8 the Old Testament prayer asks: "what are human beings that you are mindful of them, mortals that you care for them?"⁴⁰ In the form of prayer, the question about the essence of the human being is not addressed to the human being herself; rather, it is addressed to God. The human being is ultimately determined, not only through the contrast between his greatness and his nothingness, but rather by her being God's human being. His place in the cosmos is not based on the merit of his special attributes and abilities, but on grace. And what comes to expression in the psalmist's question, how the human being has deserved the care and provision of God, is thankful and humble astonishment. Only where such astonishment finds resonance, for example in the observing scientist or the practising doctor, is the theological conviction of the dignity of the human being grasped in its fullest depths.

To view the world with the eyes of God after the manner of the biblical creation myth, certainly does not mean that the human being should appropriate for himself, God's self-prompted act of making human beings in his own image. Without a doubt, the multiple warnings concerning human *hybris*, which is the driving force of much bio-medical advancement, comes up short. For, along with natural-scientific, technological, and medical progress, a new responsibility accrues to the human being, from which he cannot back away by referring to the apparent elusiveness of life. It is precisely the constraint of conscious, accountable access to one's own life as well as that of others which, not only

according to general anthropological knowledge, but according to the biblical witness as well, distinguishes human beings as such.

We must take ethical responsibility for all access to our own lives, as well as those of others. From the Christian perspective, this means that we are answerable to God. Thus, the question is as follows: which forms of conduct, concerning the world and the self, accord with the confession of creatureliness in the image of God, and which forms of conduct contradict such a confession? To ethically accountable and religiously founded living, there always also belongs a conscientious treatment of the human body. Interventions in the natural state of the human body can be in accordance with, or else in contradiction with a confession of faith in God. Medical-technical manipulations are not as such assaults on the integrity of the creation. On the contrary, they can be the practical expression of a creational piety which attempts to do justice to the biblical determination of human beings, under the conditions of our natural-scientific-technical age.

Natural science and technology rest upon *explanations* of 'nature' and 'reality.' However, one can only explain what one has *come to understand*, as I conversely must be able to *explain* what I have come to understand. However, despite this interplay between explaining and understanding, there is also a distinction between them. Yet this distinction (which hearkens back to Wilhelm Dilthey) between natural science and the humanities must not be stylized as a struggle between two unmediated, or even irreconcilable opposites. The humanities and theology both have enough reason for self-critique. The natural sciences' much lamented ignorance of the humanities is in part the invoice of the cultivated arrogance of the humanities, over and against opposite the natural sciences, since the 19th century. The state of conversation between the two scholarly cultures is thus not without irony.

The rise of a new naturalistic monism is indeed problematic, as is a corresponding utilitarianism. Naturalistic interpretations of the mind, of epistemology, of ethics, and even culture and religion – one need only call to mind the discussion of the problem of body and soul, or of free will, triggered by neurobiology⁴¹ – lead to the dominance of the natural sciences and a marginalization of the humanities. The prospect of societal and economical uses has not been without impression on politics, leading thus to the adoption of corresponding political-scientific stances. With regard to the sciences ethics must not be confined to treating questions of applied ethics in research. Rather, it has the means to develop the interdisciplinary discussion between the natural sciences and the humanities. If, however, the natural sciences and the humanities allow themselves to be played off against each other, it will not only be to their own detriment, but to the detriment of society as well.

15.6. Humanity after the Death of God

Bioethical discussions show how difficult it is for human beings to remain humane after the supposed demise of the Christian God. This is not to claim that the idea of human dignity is exclusive to Christianity. However, it should serve to indicate the aporias into which the idea strays when the possibility of its religious justification is contested. This has been demonstrated in the debate which philosopher Peter Sloterdijk unleashed with his essay *Rules for the Human Park*. In a contested, and it seems to me, wrong-headed interpretation of Martin Heidegger's *Brief über den Humanismus*, Sloterdijk not only asserts the antiquatedness of the human being as we know it up to now, but also the antiquatedness of western humanism.⁴² Proceeding from Heidegger to Friedrich Nietzsche, but also wrestling with Plato's *Politeia*, Sloterdijk characterizes the word 'humanism' as the futile attempt at self-domestication of the undetected 'animal' human being. In consideration of the new biotechnology he raises the question whether self-breeding should take the place of self-domestication, whether a new form of 'anthropotechnology'⁴³ should take the place of traditional humanism and its view of humanity, and whether a new *Übermensch*, an 'über-humanist',⁴⁴ should take the place of the old man.

Yet, perhaps the dismissal of the Christian tradition is overhasty. Certainly there is still the task of newly discovering its hitherto unreached potential and critical force. Accordingly, the new over-humanists err in assuming that the eugenic deployment of genetic engineering will lead to the final liberation of humans from their fate. In truth, the advances in the areas of medical genetics, predictive medicine, and reproductive medicine lead to new manifestations of fate. Christian belief in God, which sees the image of God in human beings, is in no way a version of belief in fate, as Dworkin insinuates. On the contrary, viewed historically, it led to the disempowerment of fate to which, according to ancient imagination, even the gods were subject. Hence, the modern denial of the Christian God, for which equivocal formulas of the death of God have been coined, has by no means paved the way to the final liberation of human beings from fate. Rather it has led, as Odo Marquard argues, to the return of fate, that is, to the emergence of new contingencies.⁴⁵ This development is, for example, pressing in the area of predictive medicine where the gap is wide between already possible diagnostics and prognostics, and non-existent therapeutic approaches. On the one hand new predictive methods of examination in prenatal medicine can serve for prevention, while on the other hand they evoke new conflicts and dilemmas.

Theologically speaking, it is the prevenient and free grace of God to which, independent of our biological condition, the human person owes his acceptance and justification. There is, in the light of biomedical advance, a new approach to the creatureliness and image-of-God in human beings. This new approach is opened up, not by a resacralization of nature, but by a justification-oriented theological reconstruction of the doctrine of creation. The

eschatological dimension of justification-faith is also relevant for bioethics, since a critical view of the latent or open danger of a soteriological elevation of modern medicine to a doctrine of salvation can be deduced from it. On the one hand, the command to love one's neighbour includes a duty to heal. The healing miracles of Jesus depicted in the New Testament, as well as the figure of thought of *Christus medicus* represent this.⁴⁶ On the other hand, all human attempts to heal are placed under eschatological reservation. Eschatology is the Christian doctrine of the Kingdom of God, and accordingly, of the perfection of the world by God. According to this doctrine, healing and salvation are to be distinguished. Otherwise medical advancement may be at risk of being seduced into barbarism by the spirit of Utopia. History and especially the medical crimes of the 20th century teach us that the desire to heal can unleash a monstrous and destructive force. If the 'therapeutic imperative' is misunderstood as a categorical imperative, medicine quickly becomes inhumane – to the point of unethical experiments on human beings.⁴⁷ Those who are considered unhealable may be the first to fall victim to the dynamic of a utopian concept of health. Discussions about new forms of selection or even human-breeding illustrate the necessity to defend the right of humans to imperfection, and make clear the positive significance of this right for the humanity of our society.

According to the reformed tradition, human dignity is based on the prevenient grace of God, which culminates in the New Testament message of the unconditional justification of the sinner. Therefore, a human being's right to life is precisely not dependent on particular intellectual abilities or her physical constitution. This follows from the connection between the doctrine of justification and Christology. Christian anthropology does not measure the person according to a generalized idea of the human and its ideal form. Rather it measures on the model of the suffering and crucified Christ, who 'had no form that we should desire him.' On this Christological basis, the view of human beings as reflecting God's image – which find its roots in the doctrine of creation – will be more closely defined.

Christian anthropology is aware of the difference between the old and the new human being. What we will be in the future is yet to be fully revealed.⁴⁸ But what is at issue here is an eschatological difference. It is a reference to the final determination and perfection of the human being which he himself cannot achieve. However, it is the old human being in his finitude, in his imperfection and brokenness, in his failure and guilt, to whom the unconditional affection of God is granted, and whom God's human being should love as himself.

That the person who through faith is justified by God remains a sinner is a basic statement of reformed anthropology. The justified sinner is unable to improve himself or the world, whether on the path of morality, or through any kind of anthropo-technology. The old human being, in the biblical view, is not in need of improvement but of forgiveness. The

creative word of forgiveness, however, does not make her better, rather it makes her new. Thus, the contribution of Christian faith to the anthropological and socio-political discussion of the present would consist in pointing toward a possibility for coping with contingency, which would free human beings from the compulsions of fate, whether self-produced or decreed by another. This ethos of 'letting-be' and pardoning rests on the premise that the human being does not owe his existence to himself, and that he did not bring himself into the world.

The development and nurture of an ethos, even an ethos of science, is not only a question of the concept of humanity, but also of education, namely the self-education and becoming-human of the human being. It includes the nurture of the religious dimension of our being human. Without a rudimentary consideration of our creatureliness, to which our birth as well as our death belongs, we will not arrive at an ethos of respect for all the living. In a society, which only thinks of itself as an information- or knowledge-society, ethics has essentially abdicated, no matter how often it may continue to come to the fore. It should belong to the virtues of all researchers to strive for education, not simply knowledge. If today the ethics of science and research are discussed, then it is not in the least because this virtue is apparently no longer self-evident.

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¹ On converging technologies and the ethical issues they raise cf. M.C. Roco, W. S. Bainbridge (eds.), *Converging Technologies for Improving Human Performance. Nanotechnology, Biotechnology, Information Technology and Cognitive Science*, Dordrecht et al., 2003; W. Baumgartner, B. Jäckli, B. Schmithüsen, F. Weber, *Nanotechnologie in der Medizin*, Bern, 2003; A. Grundwald, "Ethische Aspekte der Nanotechnologie. Eine Feldeckung," in: *Technikfolgeabschätzung – Theorien und Praxis* 13, 2004, no. 2, pp. 71–78.

² This chapter is based on U. Körtner, *Unverfügbarkeit des Lebens? Grundfragen der Bioethik und der medizinischen Ethik*, Neukirchen-Vluyn, 2001; id., "Lasset uns Menschen machen". *Christliche Anthropologie im biotechnologischen Zeitalter*, München 2005, pp. 23ff (chapter I). The dialectical interrelation of hermeneutics of technology and the critique of technology are not taken into account enough by the heuristics of fear which Hans Jonas demanded. According to the heuristics of fear bad prognoses of the future must always be given priority over positive scenarios of the future, which is why one must do without technological advancement if in doubt. Cf. H. Jonas, *Das Prinzip Verantwortung. Versuch einer Ethik für die technologische Zivilisation*, Frankfurt a.M., (1979), 1984, pp. 63ff; trans.: *The Imperative of Responsibility. In Search of an Ethics for the Technological Age*, trans. by H. Jonas and D. Herr, Chicago, 1984.

³ Cf. the famous "erledigt" – "finished" – in R. Bultmann, E. Jüngel (ed.), *Neues Testament und Mythologie. Das Problem der Entmythologisierung in der neutestamentlichen Verkündigung*, München, 1988, pp. 15f.

⁴ W. Trillhaas, *Ethik*, Berlin, 1970, p. 19.

⁵ Cf. J. Nida-Rümelin, "Theoretische und angewandte Ethik: Paradigmen, Begründungen, Bereiche," in: id. (ed.), *Angewandte Ethik. Die Bereichsethik und ihre theoretische Fundierung*, Stuttgart, 1996, pp. 2-85, here p. 42.

⁶ Cf. J. Nida-Rümelin, loc. cit. (comm. 5), p. 63.

⁷ J. Fischer, "Gegenseitigkeit – die Arzt-Patienten-Beziehung in ihrer Bedeutung für die medizinische Ethik," in: *Medizin- und bioethische Perspektiven. Beiträge zur Urteilsbildung im Bereich von Medizin und*

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⁹ W. Pannenberg, *Was ist der Mensch? Die Anthropologie der Gegenwart im Lichte der Theologie*, Göttingen, 1962, (1985), p. 5, *own translation*.

¹⁰ Cf. M. Heidegger, *Sein und Zeit*, Tübingen, 1979, pp. 145ff.

¹¹ Cf. S. Kierkegaard, *Die Krankheit zum Tode*, Gesammelte Werke, 24th dept., Gütersloh, 1982.

¹² Cf. for this purpose P. Tillich, *Systematische Theologie*, vol. I, Stuttgart, 1977, pp. 214ff.

¹³ Cf. *ibid.* (comm. 12), pp. 210ff.

¹⁴ On the state of the debate cf. B. Schöne-Seifert/D. Talbot (eds.), *Enhancement. Die ethische Debatte*, Paderborn, 2009.

¹⁵ Cf. U. Beck, *Risikogesellschaft. Auf dem Weg in eine andere Moderne*, Frankfurt a.M., 1986.

¹⁶ Cf. E. Cassirer, "Form und Technik," in: P. Fischer (ed.), *Technikphilosophie. Von der Antike bis zur Gegenwart*, Leipzig, 1996, pp. 157-213, here p. 185.

¹⁷ P. Fischer, *Philosophie der Technik*, München, 2004, p. 9.

¹⁸ M. Heidegger, "Die Frage nach der Technik," in: *id.*, *Die Technik und die Kehre*, Pfullingen, 1988, pp. 5-36.

¹⁹ For example, the invention of the telescope in order to explore the macrocosm, and the microscope to investigate the microcosm led to the replacement of pre-modern, natural-philosophical speculation with a technical kind of speculation, in the literal sense of the word. Observing nature with the bare eye and natural-philosophical thoughts about the essence were replaced by the observation with the aid of technical instruments.

²⁰ As an introduction next to Peter Fischer's work, referenced in comm. 17, see Chr. Walther, *Ethik und Technik. Grundfragen – Meinungen – Kontroversen*, Berlin, New York, 1992; Chr. Hubig, *Technik- und Wissenschaftsethik. Ein Leitfaden*, Berlin et al., 1993; H. Lenk, G. Ropohl (eds.), *Technik und Ethik*, Stuttgart, 1993; G. Ropohl, "Technikethik," in: A. Pieper, U. Thurnherr (ed.), *Angewandte Ethik. Eine Einführung*, München, 1998, pp. 264-287.

²¹ P. Fischer, *Philosophie der Technik*, (comm. 17), p. 200.

²² W. Schulz, *Philosophie in der veränderten Welt*, Pfullingen, 1972, p. 631.

²³ See in particular M. Trowitzsch, *Technokratie und Geist der Zeit. Beiträge zu einer theologischen Kritik*, Tübingen, 1988.

²⁴ M. Honecker, "Ethik und Sozialethik," in: *Theologische Rundschau* 68, 2003, pp. 151-199, here p. 199.

²⁵ *Ibid.*

²⁶ W. van den Daele, "Die Natürlichkeit des Menschen als Kriterium und Schranke technischer Eingriffe," in: *Wechsel/Wirkung*, Juni/August 2000, p. 24-31.

²⁷ J. Habermas, *Die Zukunft der menschlichen Natur. Auf dem Weg zu einer liberalen Eugenik?*, Frankfurt a.M., 2001, p. 101.

²⁸ Chr. Türcke, *Kassensturz. Zur Lage der Theologie*, Lüneburg, 1997, p. 100.

²⁹ M. Trowitzsch, *loc. cit.* (comm. 23), p. 154. Regarding his critique of modernism see also M. Trowitzsch, *Über die Moderne hinaus. Theologie im Übergang*, Tübingen, 1999.

³⁰ Cf. V. Gerhardt, *Der Mensch wird geboren. Kleine Apologie der Humanität*, München, 2001, pp. 12 ff.

³¹ F.J. Wetz, *Die Würde der Menschen ist antastbar. Eine Provokation*, Stuttgart, 1998.

³² On the following cf. also U. Körtner, *Freiheit und Verantwortung. Studien zur Grundlegung theolo-*

gischer Ethik, Freiburg im Üechtland, Freiburg im Breisgau, 2001, p. 57-68.

³³ Frankfurter Allgemeine Zeitung, from 26.9.2000.

³⁴ R. Dworkin, "Die falsche Angst, Gott zu spielen," in: *Die Zeit* no. 38, 16.9.1999, pp. 15-17, here p. 17.

³⁵ For the current state of the ecumenical discussion see Th. Schneider/G. Wenz (eds.), *Gerecht und Sünder zugleich? Ökumenische Klärungen (Dialog der Kirchen 11)*, Freiburg im Breisgau, Göttingen, 2001.

³⁶ O. Bayer, *Theologie, Gütersloh*, 1994, pp. 105.505 pass.

³⁷ Especially newer protestant theology, referencing the Reformation, proceeds not from the being of God, but from contentions concerning God. Cf. G. Ebeling, *Dogmatik des christlichen Glaubens*, vol. 1, Tübingen, 1982, pp. 169ff.

³⁸ M. Luther, *WA 40/II*, 328. Cf. also J. Calvin, *Institutes I,1,1*.

³⁹ Genesis 1:26, *NRS*.

⁴⁰ Psalm 8:4.

⁴¹ See, for example, G. Roth, *Fühlen, Denken, Handeln. Wie das Gehirn unser Verhalten steuert*. New completely revised edition, Frankfurt a.M., 2003.

⁴² P. Sloterdijk, "Rules for the Human Park. A Response to the Letter on Humanism," in: *Die Zeit* no. 38, 16.9.1999, pp. 15, 18-21.

⁴³ *Ibid.*, (comm. 42), p. 21.

⁴⁴ *Ibid.*

⁴⁵ O. Marquard, *Abschied vom Prinzipiellen. Philosophische Studien*, Stuttgart, 1980, p. 81.

⁴⁶ Cf. M. Honecker, "Christus medicus," in: *Kerygma und Dogma* 31, 1985, pp. 307-323; J. Hübner, "Christus medicus. Ein Symbol des Erlösungsgeschehens und ein Modell ärztlichen Handelns," in: *Kerygma und Dogma* 31, 1985, pp. 324-335.

⁴⁷ Cf. A. Kuhlmann, *Politik des Lebens – Politik des Sterbens. Biomedizin in der liberalen Demokratie*, Berlin, 2001, pp. 34f.

⁴⁸ 1 Jn. 3:2



Chapter 16

PROTESTANT PERSPECTIVES ON HUMAN ENHANCEMENT

by Brendan Mc Carthy

PROTESTANT PERSPECTIVES ON HUMAN ENHANCEMENT

by **Brendan Mc Carthy**

Given the confessional varieties between and within Protestant churches, it is not surprising that a range of viewpoints exists within Protestantism with regard to Human Enhancement. Certain theological and ethical motifs resonate with particular emphasis within Protestantism; the nature of the historical relationship between the Enlightenment and some branches of Protestant thought means that these are often reflected, utilising different language, in 'secular' debates within liberal democracies. This brief document outlines some of those motifs and sets them in the context of practical issues associated with Human Enhancement.

16.1. Introduction

It is not possible to speak meaningfully of a Protestant perspective on human enhancement, but given the large number of Protestant Churches and the confessional varieties between and within them, it is appropriate to speak of a range of viewpoints within Protestantism. Similarly, commentators from within the Protestant tradition will differ in their analysis of Protestant thought on the issue; correspondingly, this brief chapter represents a personal reflection on the topic rather than an attempt to reference and distill the contributions made by various theologians, ethicists and church bodies. To do justice to such an endeavour would require greater space than this short treatment allows.

Much Protestant thought and theology pertinent to human enhancement overlaps with that of other Christian traditions. Belief in God as creator, in Jesus as the mediator of the Divine Life to humanity, in the need for redemption and salvation, in human destiny being fulfilled only in God, in the Christian hope of resurrection and eternal union with God in Christ and in the ethical imperatives of love and justice; these are to be found among Protestants, in common with other Christians. There are, however, certain theological and ethical motifs that resonate with particular emphasis or importance within Protestantism. Given the nature of the historical relationship between the Enlightenment and some branches of Protestant thought, it is not surprising that some of the motifs that are most pertinent within Protestantism are often reflected, utilising different language, in 'secular' debates within liberal democracies.

16.2. Identifying the Concerns

Before looking at these motifs, it is important, first, to set the debate on human enhancement interventions in context. It is not possible to divorce the actual or potential practice of enhancement interventions from the wider process in which they are set. This process includes (i) the *motivation* for developing such interventions, (ii) the *means* by which they are developed, (iii) the *safety and efficacy* of particular interventions and (iv) the potential societal, as well as individual, *effects* of human enhancement. The process within which any application of a given enhancement intervention is set gives rise to a number of concerns:

(1) *Motivation* for developing novel interventions may stem from a range of different desires or goals. They might include the desire to address illness or disability, the desire to advance scientific knowledge and technical expertise, or the desire to pursue commercial interest. They may also include the desire to provide enhanced human experience and performance for particular individual or societal purposes. Some of these purposes may be seen as being valuable or even essential, others may be thought of as being trivial.

In principle, it may be possible to separate these motives and to be supportive of, for example, therapeutic interventions while being critical of interventions aimed purely at enhancing performance. In practice, however, motives are likely to be mixed and consequently, much more difficult to assess. In practice, is it really possible to say that if a particular therapeutic intervention might also result in enhanced performance, that the latter will play no part in the overall motivation for pursuing the technique? Equally, how realistic, or even laudable, is it to expect to achieve a consistent separation between therapeutic interventions and interventions that enhance performance? Real life is often more varied, more complex and much messier than theory might suggest, with many factors contributing to decisions that people make. Personal emotions and aspirations as well as relational and societal pressures are likely to play as great a role as reason and scientific evidence in individual decision-making. In this context, of particular concern, is the possibility that unrealistic expectations may be embraced or promoted, with individuals believing that enhancement, whether for therapeutic purposes or otherwise, will inevitably lead to better and happier lives. Relational, psychological, moral and spiritual wellbeing are complex matters; enhancement cannot provide a short-cut to attaining any of them.

(2) The *means* by which novel interventions are researched and developed may include ethically challenging procedures, such as the use of embryonic stem-cells or genetic manipulation involving embryonic or foetal material or the use of trans-species material. It is important that there is transparency around these issues so that researchers,

clinicians and potential recipients may make fully informed decisions with regard to their participation in human enhancement.

(3) *Safety and efficacy* are at stake in all subdisciplines of these 'emerging technologies'; however, they seem to be especially crucial in neurotechnologies and genetic modification, as they have the potential to affect such important issues as personal identity, individual character and mental health as well as having the potential to challenge our understanding of what it means to be human. Efficacy may be difficult to assure, given that many variables are involved in the application of novel technologies, while safety levels may be difficult to determine, given that problems can take many years to become apparent.

(4) A wide range of *effects*, both intended and unintended, will emerge from human enhancement interventions. Therapeutic advances in the care of individuals are, in principle to be welcomed, but questions of equity arise with regard to the availability, cost and general accessibility of such interventions. The use of interventions for human enhancement raises further equity and justice issues such as the influences of privilege and discrimination, the perils of societal engineering and the encouragement of elitism.

16.3. Resolving the Ethical Tensions

Addressing the above concerns requires us to recognise and to attempt to resolve a number of ethical tensions, outlined below in a series of ethical spectra. The ethical spectra have, first of all been expressed in ways that reflect debate within society and then expressed in ways that are particularly relevant to the Protestant tradition. As will be seen, there is significant overlap. The 'position' that various Protestant Churches and individuals adopt on each spectrum will, to a large extent, inform the decisions that are made with regard to the utilisation of various enhancement interventions. As might be expected, given the importance of personal conviction and individual choice within the Protestant tradition, as well as the differing emphases to be found between and within various churches, Protestant opinion covers the full range within each spectrum. The analysis below attempts simply to outline the nature and context of the topics being debated, raising issues without necessarily trying to resolve them, whetting the appetite, it is hoped for further enquiry and investigation.

(1) *Communal responsibility–Individual Freedom (expressed theologically as Justice–Freewill)*: individual freedom to pursue, to apply or to receive the benefits of human enhancement must be balanced by the effects of such actions on others. While true individual freedom may be found only when it is focused on God and on others, ideally a decision to act in this way ought to be a genuinely free one, without trace of coercion. We do not live, however, in an ideal world and some degree of regulation is necessary to ensure a working

balance between individual and communal rights and needs. The integrity and cohesion of society is undergirded by equitable access to treatment for individuals as well as by limits being placed on the advantages that individuals might gain through enhancement, made possible because they enjoy financial or social privilege. Moreover, apart from the effects, that such differences may have on the cohesion of a society, the existence of excessive inequality between individuals and between groups may, rightly, be seen as being intrinsically problematic.

(2) *Nature–human intervention (expressed theologically as Stewardship-Co-creation)*: while human beings are part of nature, we have developed unprecedented abilities to manipulate the rest of nature as well as to alter, adjust or augment our own bodies and minds. To what extent ought we to view nature, as it has evolved and developed over time, as created and sustained by God, to represent a template that ought to be adjusted or augmented only with caution? Alternatively, ought we to view our destiny as something that is, to an extent at least, in our own hands, as co-creators with God, within the context of God's creation of the universe? An inherent caution is often evident as a 'default position' with regard to 'changing' nature. This may properly reflect a desire to minimise the introduction of risks into a finely-tuned bio-system, but human interventions in nature have resulted in great good as well as notable harm.

(3) *Fixed – fluid understanding of human nature (expressed theologically as Creation-New Creation)*: undergirding this spectrum are two further issues: whether human nature can be defined or, more appropriately, described and whether human development is best understood as a comprising a series of distinct and fixed points or as a gradualist continuum. Traditionally, many philosophers, theologians and ethicists sought to define human nature, viewing the human species as being biologically distinct from other species, with various distinctions being clearly delineated. Moral significance was often attached to particular developmental points, both in the emergence of the human species and in the emergence of individual human persons. In contemporary thought, including Protestant theological and ethical thought, a gradualist and holistic approach is often preferred, with human life being seen as part of a greater continuum of life on Earth and individual human lives as representing a continuum from one generation to another. Those who tend towards the 'fixed' end of the spectrum tend also towards limiting novel neurotechnologies to strictly therapeutic purposes while those who take a 'fluid' approach are more likely to be open to utilising neurotechnologies for enhancement purposes.

(4) *Ideology-reasoned pragmatism (expressed theologically as Revelation-Reason)*: it is impossible to approach ethical issues in an ideologically free manner (pragmatism may, itself, be presented as an ideology), but for some individuals and groups their distinctive philosophical, theological or political dogmata are clearly paramount while, for others,

ideology is more obviously tempered by reason and experience. Within the Protestant tradition, the place of the Scriptures as a definitive witness to God's self-revelation, has always occupied a central position. Nonetheless, the Protestant tradition has also been home to much rationalist thought and parts of the Protestant tradition have particular resonance with the Enlightenment. The tension between revelation and reason is resolved differently by various Protestant Churches and theologians, but it is seldom absent in ethical enquiry. While those who strive to adhere to revelation, or to a particular interpretation of it, might view reason with some degree of suspicion, others argue that it is precisely in the tension between revelation and reason that rich creativity may be found.

(5) *Pessimism-optimism (expressed theologically as Fall-Creation)*: an often overlooked factor in ethical and policy decision-making is the inherent attitude of individuals and groups towards the human race and to human history and society. Within the Protestant tradition there is tension evident between those whose essential understanding of humanity is based on the significance of the Fall and on those who look essentially to the inherent goodness of creation and to the concept of the Image of God. Those individuals and churches that focus on the fallen and sinful nature of humanity, in need of redemption and sanctification, may tend to view human enhancement with great caution, identifying it, potentially, as a new means of human beings expressing *hubris*; a modern Tower of Babel, raised, perhaps unconsciously, in rebellion against God. Those that take an incarnational approach, emphasising not only that humans are made in the Image of God, but that, in Christ, that Image is restored, may tend to view enhancement as not only contributing to the restoration and fulfilment of creation, but also seeing it as an expression on the inherent God-given goodness of that creation. Most Protestants will adopt a stance somewhere between these extremes, but will try to balance the tension between the twin realities of the goodness of divine creation and the bitter realities of sin.

16.4. Concluding Remark

From this very brief and personal analysis of Protestant perspectives on human enhancement, it may be argued with some degree of assurance that debate within Protestantism reflects the debate within wider society. It does so, perhaps more fully than is the case within some other Christian traditions where a more uniform and unified approach may be evident. As such, while Protestant Churches might be criticised for presenting a fractured witness to society, it might also be recognised that they are also well placed to draw alongside diverse societies in their quest better to understand and to apply techniques and technology associated with human enhancement: principled fellow-travellers might be welcomed where moral guides might be viewed with suspicion or even hostility.

Chapter 17

HUMAN ENHANCEMENT AND SCIENCE: THE IDEA OF PROGRESS RE-VISITED

by Janne Nikkinen

HUMAN ENHANCEMENT AND SCIENCE: THE IDEA OF PROGRESS RE-VISITED

by **Janne Nikkinen**

In this chapter I evaluate the role of progress in relation to human enhancement debate. It is possible to address problems and controversies of enhancement from a theological and philosophical standpoint, even though there is remarkable disagreement about what exactly counts as enhancement. I claim that the concept of progress has been little discussed in publications about enhancement so far, which creates confusion about the proper goals and aims of research. Clarifying the notion of progress and its meaning is needed in order to move forward in the discussion about human enhancement. This is especially important for allocation of resources to research in this field, as otherwise there may be ideologically motivated research detached from reality in which the actual research is conducted. Solely enhancing human capacities without addressing more urgent health needs first has little or no relevance to those funding the research.

The purpose of this contribution is to evaluate the idea of progress in relation to the modern debate about human enhancement. It may be that certain presuppositions and conceptual underpinnings influence viewpoints without being recognised by those discussing the questions. The challenges of human enhancement, including types of enhancement, have been dealt with extensively by other writers. Therefore, I will not use space here to present the general issue of human enhancement again.

Rather I will first mention a few things about the role of theology in human enhancement, as theology provides certain insights into the conceptual history of the idea of progress. Thereafter, I focus mainly on the relationship between enhancement and the idea of progress, which I do not think is addressed often enough in the current philosophical debate. Finally, I will note briefly some possibilities for re-evaluating progress in the future.

17.1. Theology and Enhancement

Almost any human development can be viewed simultaneously from both a secular and a theological perspective. To ask first what development means for humanity would beg the question of what it means to be human, thereby raising issues related to human anthropology and man as a created entity. Secondly, it is also possible to reflect on some specific forms of enhancement from the vantage point of its meaning for society. In this context, we are also asking about our insights into what the social order should be. Thirdly,

when we evaluate what a specific enhancement means for the environment, we are at the same time asking what it means to act ethically.¹

There are various levels of technological assessment that may or may not also involve theological reflection. According to one classification by Gerald McKenny, the first level of discussion is that in which devices, techniques and specific procedures are explored (mostly) by moral philosophers and policy experts.² The second level of discussion involves evaluating changes that occur in social practices, which affect the general public in the form of technological advancements. The third level of discussion is the evaluation of the impact on worldviews and ideologies, which technological advancements have already had or possibly will have in the future.

McKenny points out that most theologians usually operate on the third level, since this level has an easily comprehended philosophical content with which theologians are familiar. However, the first-level evaluations (which are to some extent technical) are where technological advances are recognised and anticipated before adaptations at the second (societal) level take place. In practice, this means that theologians sometimes lag seriously behind in discussion if they choose to take part only at this third level of technological assessment and its related enhancement debate. It should also be noted that these third-level discussions (mostly ideological and worldview) are rarely actively followed by policymakers or lay participants, who pay more attention to first-level debates and reflections, as this level gives some indication of technical applications in the future. The first level is also especially interesting to the general public, whose members may look forward to specific innovations for their own personal use and benefit. Furthermore, policymakers are keen to determine the costs and benefits of forthcoming technological products and services.

What brings all three levels together in the debate on human enhancement is that all of the discussion participants expect *progress*. Without progress, it would be difficult to speak about enhancement in the true meaning of the word, and investments in any research and development work would soon be jeopardised. For theologians, too, progress is important, as this is part of co-creation and governance of the earth (which downgrading material things and attenuation of the living environment would never be). Of course, there are always those who call for a return to some kind of 'Golden Past', but in the modern technological debate such voices are marginalised, since the consensus is that giving up modern technology would be detrimental, for example, to our food production and to the functioning of a mass society.

Expectations of progress are generally related to health care and cures for diseases (including better medication and more efficient treatments), increased life expectancy and lower mortality rates. People everywhere are happy with this kind of progress. However,

in the context of human enhancement it is not only a matter of improving medical technology, but also a question of increasing or improving value, quality or attractiveness, perhaps with expensive niche technology, which has little or no relevance to the health needs of the general population. Thus, a value component is present, i.e. an evaluation that B is somehow better than A.

If progress is defined in this way, then a change in the value component from A to B also involves progress from A to B. Since it can be said that technological progress is the progress of humankind or society, any development or enhancement happens in what Josef Fuchs has called 'man-world' reality.³ The divisive issue here, of course, is whether there is an external (transcendent) observer who sets the standards for evaluations or whether humans are free to evaluate progress as they desire (the secular viewpoint). Where research funding for medical nanotechnologies is concerned, it is somewhat difficult to take religious viewpoints into account, but at the same time it has to be acknowledged that expensive work in research and development may become worthless should consumers or the end-users of the products not be willing to accept the results. In the discussion surrounding genetically modified organisms (GMO) in the 1990s, the issue was that, in addition to health concerns, food also has important religious connotations. This is not to say that the GMO debate would otherwise have provided meaningful analogies or input into the current debate on nanobiotechnology or human enhancement, as Roland Sandler and W. D. Kay have pointed out.⁴ Rather it is to point out that religious perspective may play an important role in accepting and adapting novel technologies (such as biotechnology).

In dealing with the opposition to new technologies, the role of scientific progress is often viewed as straightforwardly positive: as new products and services are developed with investments in research and development, there are usually commercial applications as well. In the context of the Finnish biotechnological discussion it has been noted that, as universities are involved in research and development and industry is involved in the development and applications of this research, ordinary citizens mainly have contact only with the Finnish state. Although democratically-elected state officials are in principle advocates for the public, without strong consumer advocacy groups such officials may have only a limited interest in research or even limited opportunities to interfere with the actual work done in research and development.⁵ In Finland, for example, there are practically no advocacy groups for GMOs. Thus, it is relatively easy to advance various kinds of research involving new and experimental technologies, while paying attention only to occupational health and safety. As has been recently suggested, a pan-European authority to evaluate the regulation of nanotechnology might be needed in the future to ensure the safety of food and cosmetics that involve research and development using nanotechnology.⁶

Advances in medicine are the most appealing to the general public, and thus these create a favourable environment for research and funding. Some publications even recommend the use of these advances to erode the opposition to new technologies, opposition that is religious in nature.⁷ The competitiveness of the European Union (*vis-à-vis* NAFTA, ASEAN and similar entities) is also given as a reason to invest in science and to encourage progress. Nano- and biotechnologies are increasingly seen as value-added industries in the current difficult economic environment, as they have the capacity to use innovation as a strategic element for enhancing competitiveness.⁸

Here it is worth noting that none of the aforementioned reasons for advancing research in nanotechnology is inherently scientific. Proponents of such research are either using science only as tool to gain public support for public investments or they are trying to gain acceptance for technology without proper evaluation of whether certain advances are truly advances at all. Any change to an existing application or technology is not necessarily an improvement, as the change may also be dangerous or even toxic in the long run. A misconception of progress may hinder the evaluation of whether all technological progress is truly good in itself. It may also interfere with assessing the question of whether academic freedom should be the sole grounds for research on nanobiotechnology capable of producing enhancement when there are other ways in which scarce resources can be used (the opportunity cost). Especially in healthcare research, it may sometimes be more reasonable to use money temporarily to address certain health problems in which the results are unclear or pending rather than to invest it in developing future technologies that hold out promises which may never materialise. A further difficulty in the healthcare priority setting debate is that its viewpoints and assumptions are often ideological (without clear evidentiary support).⁹

17.2. The Idea of Progress: Historical Developments

The influence of the idea of progress on technological research and development is difficult to measure, as progress may relate to various aspects of research and development. It is possible to speak of progress in a morally neutral sense, which would mean only a movement forward or an advance in existing technology, mainly improving efficiency through a desired action (for example, a change from carriages to articulated lorries in transporting goods). Progress may also be a 'gradual betterment of humanity,' which takes place when an increase in goodness, happiness or some other human-related aspect (not related to technology in itself, but to valuation) is deemed to have occurred.

It is important to observe that every theory of progress always invokes the notion of an ultimate good, whether this good is 'speed' relative to transportation or a goal for the betterment of humanity. This is taken to be gradual progress: ultimate good will eventually triumph.¹⁰ Progress in itself is not, as is often believed, originally a secular idea.

In the Christian religion, progress has meant movement upwards towards the Creator. In societies preceding Judeo-Christian influence, there was almost always some kind of mythical 'golden age' in the past and the passing of time led only to degradation and corruption.¹¹ For example, in the 8th century BCE, the Greek poet Hesiod wrote of five successive ages from a golden age to an iron age (cf. Virgil and Ovid later in Rome). The impact of Christian theology added spiritual education by God, a notion invoked especially by Augustine of Hippo (354-430), to his City of God. This notion included conceptions such as the linearity of time, the continuity or regularity of the cosmos and the gradual coming of the Kingdom of Heaven. Thus, progress is deeply rooted in Judeo-Christian thought.

What the Enlightenment changed, with its purpose of reforming society, was that while Christianity had seen heaven outside of time, it was now possible to speak about earthly perfectibility. In contrast to Divine providence, the Enlightenment offered human efforts instead. The opinion of posterity, instead of the judgement of God, was seen to guide action or choice. Finally, instead of redemption, humanity was offered the doctrine of progress.¹² After the Enlightenment the idea of progress in a secular sense was developed further by writers such as August Comte (1798-1857), Charles Renouvier (1815-1903), Ferdinand Brunetière (1849-1906), Robert Flint (1838-1910), and J. B. Bury (1861-1927). Philosopher and sociologist Auguste Comte wrote in his *Cours de philosophie positive* that the laws of progress should be defined 'by the positive philosophy alone!' Comte advanced the viewpoint that in a metaphysical era (when the Judeo-Christian worldview was dominant in Europe) with its 'sterile dogmatism,' no genuine idea of progress was possible. The failure of the theological and the metaphysical is the opportunity to capture the public mind (for which the idea of progress provided material). The French philosopher Charles Renouvier in turn saw that the Christian 'fixation' on the world to come had passed and that modern faith in progress seeks improvement only in time and on earth. The French writer and critic Ferdinand Brunetière saw 'hints of progress' in Genesis, the writings of Epicurus, and similar contributions, but nevertheless thought that progress was a modern idea. The Scottish theologian Robert Flint combined the idea of progress with the laws of evolution and thus paved the way for the modern idea of progress.

The most influential individual, however, in shaping our understanding of progress as an idea was the Irish historian and philologist J. B. Bury, who published his seminal work, aptly named *Idea of Progress*, in 1920. Here Bury defined progress as meaning that 'civilization has moved, is moving, and will move in a desirable direction.' This forward-moving motion of civilization was deemed to continue indefinitely. However, of necessity this must be a secular process: Bury stated that 'it must not be at the mercy of any external will [i.e., God]; otherwise there would be no guarantee of its continuance and its issue, and the idea of Progress would lapse into the idea of Providence'.¹³ It should be noted that this definition is ideologically in line with Enlightenment thinking (there is no logical necessity demanding the separation of thoughts).

Many have provided responses to Bury, including the German philosopher Karl Löwith (1897-1973), the American theologian H. Richard Niebuhr (1894-1962), the Scottish theologian John Baillie (1886-1960), the German-born American political philosopher Eric Voegelin (1901-1985), and the Swiss Protestant (reformed) theologian Emil Brunner (1889-1966). What connects all of them in this context is the view that the modern idea of progress is more a product of antiquity and the Middle Ages than Bury realised. Theologians of the aforementioned groups also saw that the notion of progress in its current (corrupted) form surfaced from the collision of the pagan and Christian worldviews.¹⁴ These theologians included Brunner, who wrote that modern Progressivism is 'the bastard offspring of an optimistic anthropology and Christian eschatology.' Baillie saw the doctrine of progress as a 'Christian heresy.' In addition to these perceptions arising specifically from Christian theology, Karl Löwith, writing as a philosopher, maintained that belief in progress is 'a sort of religion, derived from the Christian faith in a future goal, though substituting an indefinite and immanent eschaton [the end of the present world] for a definite and transcendent one'.¹⁵

17.3. The Idea of Progress Today

W. Warren Wagar has noted that there are many open questions about the modern development of the idea of progress, including why the idea of progressivism relating to Christian theology was combined with nineteenth-century French ideas, instead of, for example, with German idealism, including Immanuel Kant and G.W.F. Hegel.¹⁶ In fact, there are many ideas of progress and 'where the lines are to be drawn and how the various types are to be discriminated historically is exceedingly difficult to determine.' However, Wagar also states that '[a] case may be made that any civilization capable of producing a Galileo, a Descartes, a Newton, a Locke would in due course have also brought forth an idea of progress, with or without Judeo-Christian heritage' and that '[t]he fact will remain that only Western civilization produced a Galileo, a Descartes, a Newton, and a Locke.' Therefore, the idea of progress and the belief in it, as we currently know and understand it, is a product of Christianity and the Enlightenment in its French version. In particular, its combination with the theory of evolution means that progress has had a strong influence on the modern European worldview; labelling something 'progressive' is understood as meaning to advocate more advanced or liberal ideas. In a philosophical sense, this only relates the truth-value of certain ideas to the passage of time, without providing any justification for the claim itself.

If we accept the notion that the idea of progress is deeply rooted in the Judeo-Christian (and especially the Enlightenment) worldview, it is not possible to state that progress has always been a global and necessary phenomenon. Louis Laurent and Jean-Claude Petit note that progress has also been labelled local, discontinuous, non-linear by various thinkers, including G.E. Lessing (1729-1781) and, in more recent times, by Claude Lévi-

Strauss and Karl Popper.¹⁷ These thinkers all advanced the notion that progress is not universal, continuous, cumulative, unambiguous, or even necessary for human society. Thus, we should not accept as self-evident that all that is labelled 'progress' is always of benefit to humanity as a whole. In fact, something that seems at first to be progress may be detrimental in the long run. Thus, in setting scientific policy goals, it is important to choose goals that are attainable and that respond to the current needs of those who provide the funding for research. Even though human enhancement by means of modern and expensive cutting-edge technology has attracted a great deal of attention from philosophers, policymakers, and others, it should be recognised that current challenges to public health in Europe are rather basic and may not necessarily be remedied by any method of human enhancement. Rather these challenges result from alcohol and other substance abuse, mental health problems, and obesity. In general, life-style related behavioural addictions caused by a sense of emptiness, such as pathological gambling, pose a serious threat to public health across Europe.¹⁸

17.4. Discussion

In recent years there have been a number of papers defining what counts as ethical in relation to human enhancement. Thus far, there is no consensus on the question.¹⁹ The problem with this discussion is that unless the concept of 'progress' is defined and its role and influence properly understood, the discussion about what counts as enhancement has only a limited ability to advance in any meaningful sense. Many contributions to the debate seem repetitive and do not appear to advance the discussion as a whole. Addressing the issue of what counts as progress would first lead to questioning the 'science-as-saviour' mentality and this in turn would question the idea of continuous and indefinite progress. This kind of thinking has had serious consequences on the European economy in the sense that belief in infinite growth has motivated financial actors. This same thinking may well have a similar effect on scientific policy in the EU, unless we recognise that a small error in the beginning may lead to a huge one in the end (in line with Aristotle's thinking). We should not see converging technologies as a sure-fire vehicle for economic growth, since examples from other fields of scientific inquiry, which were originally promoted as ground-breaking and innovative and which have attracted a great deal of investor and public funding, have yielded few results.

With regard to biomedical science, Gareth Jones has noted that there are several ill-founded beliefs about what might be possible in the future and whether biotechnology will ever be capable of dealing with the difficulties.²⁰ For example, the complexity of the human body (especially the brain) will impose certain limits that may not be possible to overcome, even with extraordinary amounts of time and resources. Additionally, the effectiveness of biomedical procedures is often somewhat poor, and side effects (both existing and expected) are common. Therefore, the costs incurred by those funding

biomedical research are often so high that all kinds of research on the grounds of academic freedom alone are simply not meaningful enough to carry out. In practice, this sometimes means that trying to attain an uncertain future medical goal may mean sacrificing health benefits that could rather easily be achieved in the present and thus are a waste of limited resources. In the European Union, this also means a waste of taxpayers' money, although the EU budget revenue is partially derived from other sources, such as VAT and taxation other than personal income tax. Currently, for example, alcohol is the third leading factor in disease and mortality in Europe, after tobacco and high blood pressure.²¹ For these top three health problems, nanobiotechnology or human enhancement may have little or nothing to contribute to treatment and prevention. This is not to say that the funding of nanobiotechnology research should be halted or the human enhancement debate discontinued, but simply to point out that the general research priorities (including health research) should be established according to public health needs.

17.5. Conclusion

If we are unable to agree on what counts as enhancement, then we should first discuss who defines enhancement and what counts as scientific progress, and discuss limits to advancing nanomedical progress within the realm of EU research funding. Providing answers in all three of these areas would provide more conceptual tools with which to address the issue of what counts as enhancement, a matter about which there is already extensive debate. Discussion about the true nature of the idea of progress would lead us to the root of the confusion, which is the idea that technological progress automatically advances human good. Even though almost all Europeans living today are, in material terms, measured as being wealthier than kings of one hundred years ago, mental health problems, alcohol and other substance abuse, including drugs, are on the rise. If progress is understood only narrowly as improvement in technology, then the gap between the haves and have-nots will only widen in the future. This is because new technologies will usually be mostly available to the affluent who can afford them in the first place. Only the long-run technological advances will benefit the lower classes. Although we have limited opportunities to evaluate the exact health problems that human enhancement technologies will eventually be able to resolve or assist, we should perhaps focus primarily on existing and proven health issues in Europe and only then invest in speculative research. At the very least, we need an understanding of progress from the perspective of Leo Tolstoy, who regarded true progress as "greater clarification of answers to basic questions in life."²² Technological progress combined with materialism cannot answer the need for humans to find meaning in their own lives, and lengthening the human life span or physical capacities through enhancement will not fulfil the emptiness in any human heart.

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- ¹ Davies 2011; see also Deane-Drummond, 2001.
- ² McKenny, 2002.
- ³ Fuchs, 1971.
- ⁴ Sandler & Kay, 2006.
- ⁵ Snell, 2009, especially Fig. 4.
- ⁶ Malsch, 2011.
- ⁷ Cf. Malsch, 2012, 35.
- ⁸ Laurent & Petit, 2006.
- ⁹ Nikkinen, 2007.
- ¹⁰ Wagar, 1967.
- ¹¹ Laurent & Petit, 2006.
- ¹² Wagar, 1967.
- ¹³ Bury, 1920.
- ¹⁴ Wagar, 1967.
- ¹⁵ Brunner, 1954, Baillie, 1950, Löwith, 1949, all quoted according to Wagar, 1967.
- ¹⁶ Wagar, 1967.
- ¹⁷ Laurent and Petit, 2006, with a reference to Van Doren, 1967.
- ¹⁸ Orford, 2011.
- ¹⁹ See Miah, 2011 for a discussion of the subject.
- ²⁰ Jones, 2010.
- ²¹ Anderson *et al.* (eds.), 2012.
- ²² Tolstoy, 1985.

Chapter 18

ON THE PROSPECTS FOR HUMAN ENHANCEMENT BY TECHNOLOGICAL MEANS

by M. Pilar Nuñez Cubero

ON THE PROSPECTS FOR HUMAN ENHANCEMENT BY TECHNOLOGICAL MEANS

by **M. Pilar Nuñez Cubero**

A ROMAN CATHOLIC PERSPECTIVE OF THE BIOETHICS REFLECTION GROUP MEETING OF THE COMMISSION OF BISHOP'S CONFERENCES OF THE EUROPEAN COMMUNITY¹

M. Pilar Nuñez explained the Opinion drawn up by the Reflection Group of COMECE:

"The desire for development, even perfection, can be found in every human being." Nowadays, rapid technological progress, under the heading of NBIC (nanotechnologies, biotechnologies, information technologies and cognitive sciences), has led to the emergence of a new category of possible applications. Some of them are used as medical treatments to restore or replace some pathological disorders and disabilities. The same techniques could be used for enhancement, i.e. to develop, boost or modify the capacities generally found in humans. Some people, referred to as 'transhumanist', intend to use these techniques to change humans and even to create a new human species.

For most of these techniques, prudence demands great caution in their application to healthy persons. The risks and benefits should be weighed very carefully.

They do not resolve the key problems of human life: suffering and the lack of trust and love.

Policy-makers should ensure that these new techniques do not aggravate inequalities, but rather reduce them.

18.1. Introduction

The desire for development, even perfection, can be found in every human being and has always inspired humanity in a quest that has undeniably borne fruit, such as in education for all in many countries and in increased longevity.

Rapid technological progress, under the heading of NBIC (nanotechnologies, biotechnologies, information technologies and cognitive sciences), has led to the emergence of a new category of possible applications. We already use cochlear implants, electronic devices to restore hearing to people with severe hearing loss by directly stimulating the hearing nerve fibres via electrodes. We have also succeeded in connecting the human brain to a computer and the internet, with surprising results; however, it can also blur the distinction between humans and machines.

In many cases, these techniques have been developed to combat or prevent disorders and disabilities deemed to be pathological; they have therefore a medical origin. However,

the same techniques could be used for enhancement, i.e. to develop, boost or modify the capacities generally found in humans.

There are currently proposals on the table to target these objectives; to develop NBIC techniques to augment human abilities for the benefit of certain individuals, or of humanity as a whole. Some people, referred to as 'transhumanist,' even intend to use these techniques to change humans, not just physically but also their thoughts, their vision of the world and their values, and even to create a new human species. In such a context it would seem important to question the concepts of 'human,' 'trans-human' and 'post-human.'

A Topical Debate

These new possibilities for human enhancement are fuelling an international debate, especially in the English-speaking world. The European institutions are getting to grips with the issue with the Science and Technology Options Assessment (STOA) committee of the European Parliament creating a working group to review the issue. The European Group on Ethics in Science and New Technologies at the European Commission (EGE) had already presented an Opinion in 2005 the 'Ethical Aspects of ICT implants in the human body'.² The European Group on Ethics also deemed that, at the time of writing its Opinion, because of the rapid development of these technologies, which raise both hopes and fears in society, a review of the Opinion may be necessary within three to five years.³ That time has now come.

18.2. Definition and Techniques

18.2.1. Definition

A widely accepted definition of human enhancement is attributed to Douglas: "The use of biomedical technology to achieve goals, other than the treatment or prevention of disease".⁴ As we can see, the field of human enhancement, defined in this way, is large and complex, and the definition is far from precise. The concept can be applied to very different activities such as the use of caffeine, the use by students of Ritalin to stimulate the central nervous system in order to boost their ability to concentrate, or the creation of new capacities that humans do not normally possess, such as the ability to perceive infra-red light, or establishing a direct connection between the brain and a computer.

18.2.2. Techniques

In order to assess the different forms of human enhancement, we need to distinguish between the ends and the means.

The Ends

The STOA committee working group on human enhancement proposed the following four categories: cognitive enhancement, mood enhancement, body enhancement and enhanced life span.⁵ The classic example of *cognitive enhancement*, already mentioned above, is the use of Ritalin – a medicinal product designed to help people suffering from attention deficit hyperactivity disorder (ADHD) – by persons in good health to improve their powers of concentration. *Mood enhancement* includes the use of antidepressants by healthy subjects or the implantation of electrodes in the brain for deep cerebral stimulation, in situations other than sickness (such as Parkinson's disease) for which stimulation might be used as a medical treatment. *Body enhancement* covers the fields of cosmetic operations, research into brain-computer interfaces (already used experimentally to help tetraplegic patients to communicate with computers and thereby with the external world), genetic modifications to enhance certain bodily functions, and finally the full range of prostheses, some of which can be very sophisticated and boost abilities (such as abnormal muscular strength or skeletal strength). *Enhanced life span* means slowing down the ageing process using suitable drugs or even replacing organs.

The Means

There is a great variety of means that can be used for the purposes of human enhancement, including nutrition (such as caffeine, functional foods, etc.), pharmaceutical products (such as Ritalin, which is used by healthy people to enhance their ability to concentrate), implants and prostheses (such as cardiac stimulators, cochlear implants, artificial retinas, neuro-implants such as electrodes for deep brain stimulation, chips integrated into the nervous system, etc.), brain-machine interfaces (experiments performed to date by Professor Warwick⁶; in the longer term other applications may be found); and pre-implantation diagnosis to select human embryos.

Reversibility-Non Reversibility

A distinction needs to be made between means (for example, irreversible genetic modifications) which produce permanent changes, and others (such as the majority of pharmaceutical products) which have reversible effects.

18.3. Ethical considerations

18.3.1. Promoting Health and Human Enhancement

There is an important distinction between 'treatment' – restoring homeostasis to an organism altered by sickness or a physical disorder – and 'enhancement' or modification of the functions or abilities of the organism beyond their normal level. The frontier between them is rather blurred, especially as culture has an influence on perceptions of health and

sickness. It may be quite clear in some fields, but hard to pin down in others.

Each new technique must therefore be examined in depth in order to distinguish between any clearly 'therapeutic' applications, and others that should be classified as a quest for 'enhancement' of human capabilities.

18.3.2. Expectations

These new techniques give, or are claimed to give, individual benefits, and this creates expectations among the population. It is fair to ask whether such expectations are sometimes excessive, and whether fashion has had an effect, which could cause us to neglect the traditional means of human development (education, teaching, lifestyle, eating habits, developing interpersonal skills, etc.). One might also wonder whether new technologies are expected to provide benefits in terms of individual effectiveness and therefore competitive social advantages, to the detriment of solidarity with the weaker members of society.

Naturally these new technologies have important applications in combating different forms of handicap, such as cochlear implants for persons who are profoundly deaf in both ears, artificial retinas for the blind,⁷ brain-computer interfaces for those suffering from locked-in-syndrome, etc. In such cases they could be considered as 'treatments', which means that in each individual case we have to take into account not only the expected benefits, but also the associated risks and the resulting deprivations, the cost and the burden for society. Many of these techniques are still in the experimental stage and their use may prove to be disproportionate or beyond the reach of a particular country.

18.3.3. Anthropological Considerations

This begs the question of the wisdom and limits of 'human enhancement'. Is it a form of human development or only the development of certain abilities? A distinction needs to be made between the development of certain capacities, such as memory, concentration or even infrared vision, and what could be called development of the whole person.⁸

It should also be stressed that human health covers more than just the bodily dimension; it is not solely the absence of somatic illness but includes, according to the well-known WHO definition, a psychological, social and spiritual dimension.

More profoundly, the way in which we see the concept of human enhancement certainly varies according to our conception of the human being.

Men are nothing but biological machines,⁹ according to Marvin Minsky and other post- or trans-humanists, or rather should we consider people, after Aristotle, as rational beings, or as persons, a veritable end in themselves blessed with incomparable dignity according to the philosopher Emmanuel Kant, or as beings created in the image and likeness of God called on to love their creator and their neighbour?

According to these different concepts, should all human enhancement using NBIC technologies be seen as just an extension of what humans already are; or conversely, must it be evaluated in terms of the attainment of the recognised purpose of human existence that it allows?

18.4. Some Criteria for Assessing Enhancement Techniques

18.4.1. Harmonious Development of the Person

Given the complexity of the technological and anthropological context, it would seem premature to offer a definitive response. The debate is nevertheless urgent, because certain technologies could profoundly modify humanity. Some authors talk of the extinction of the human species and the advent of a 'trans-human race.' This almost certainly points to illusions concerning the transformative power of NBIC technologies, but nevertheless raises the question of thresholds that must not be crossed in the name of respect for humanity.¹⁰

Without seeking to modify humanity as a whole, there are those who invoke a 'principle of autonomy,' to which they assign a supreme value, in the name of which they call for the freedom of the individual to choose the person they wish to become using new technologies, rejecting any limitation by whatever authority on achieving their desires. This 'principle of autonomy,' in the sense of the principle of self-determination, was put forward some thirty years ago by an American bioethics movement. Its authors acknowledged that it was poorly formulated.¹¹ Anyway, it would be a massive contradiction to reject any social authority in a particular field and then call for the assertion of rights in the same field. In any case, we need to keep in perspective the harmonious and full development of the person. We therefore have to ensure that the development of such abilities does not come at the price of human impoverishment in general.¹² Above all, we must not lose sight of personal responsibility or prejudice personal identity.

18.4.2. Global Solidarity, including International Justice

We have to ensure that each application does not widen the gap between rich countries and developing countries.

18.4.3. Justice within Each Country

At national level, the evaluation of any application of these technologies should take into consideration the social justice dimension in order to avoid any aggravation of inequalities. Although some people seek to benefit from 'enhancement' techniques for strictly personal reasons, human enhancement technologies are often used to seek superiority over others, leading to inequality and even domination. In sport, this is called doping. But doping is not restricted to the field of sport; it can be found in social life, distorting competition between social agents.

18.4.4. The Precautionary Principle: Taking into Account Secondary Effects, Risks and Losses

The precautionary principle requires a careful independent analysis of the risks involved in each application, taking into account the reversibility or otherwise of the effects produced. For example, the effects of deep brain stimulation cannot be evaluated for lack of sufficient data.

18.4.5. Consent and Repercussions on Future Generations

The general principle governing human experimentation is that all research requires the expressed and informed consent of the person concerned. This raises serious questions concerning the application of NBIC technologies that could have effects on future generations. In gene therapy, any modification of the genome that could be transmitted to descendants is banned. Such a widely accepted rule should be borne in mind whenever a profound modification of a human being is envisaged using new technologies.

18.4.6. Case-by-Case Evaluation

If all of these criteria are satisfied, each technique must still be assessed on a case-by-case basis before being applied to a given person.

18.5. Conclusions

For most of the techniques referred to in this Opinion, prudence demands great caution in their application to healthy persons, given the huge risks that they entail. In any event, every time the use of these techniques is considered, the risks and benefits should be weighed very carefully.

For applications that apply to handicapped people, great care should be taken to avoid crossing the line between therapy and ‘enhancement.’ Policy-makers should ensure that these new techniques do not aggravate inequalities, but rather reduce them. In the European Union, the European Commission should act with particular transparency regarding research projects with an enhancement component. In addition, it should encourage researchers to seek a dialogue with society, and to consider the long-term effects of their research.

It is hugely important to be aware of what these human enhancement techniques cannot do. They do not provide a means of resolving the key problems of human life: suffering and the lack of trust and love. For the Bioethics Reflection Group, a successful human life includes acceptance of the limits of the human condition.

We therefore call for an in-depth debate on the promise – or illusion – of the creation of a new human condition. We need a wide-ranging discussion in our societies on what is desirable for the future of humanity, and on the values that should guide research and the development of new technologies.

¹ This is the Opinion of the Bioethics Reflection Group meeting of the Commission of Bishop’s Conferences of the European Community (COMECE) of 25 May 2009. Published earlier in *Science & Ethics*, 2, “Sexual and Reproductive Health Post-Coma Unresponsiveness Human Enhancement Non-Commercialisation of The Human Body,” Brussels: COMECE 2009, 50-7. The Opinion was presented at the CEC Conference on Human Enhancement in Brussels by Maria Pilar Nunez Cubero.

² The European Group on Ethics in Science and New Technologies (EGE), *Ethical Aspects of ICT Implants in the Human Body*, Opinion 20, Brussels 2005.

³ *Ibid.*, § 6.5.6.

⁴ T. Douglas, “Enhancement in Sport and Enhancement outside Sport,” in: *Studies in Ethics, Law and Technology. Questions of human enhancement*, 1,1 (2007), cited in Rinie van Est, Martijntje Smits, and Mirjam Schuijff, *Future man – no future man: Connecting the technological, cultural and political dots of human enhancement*. The Hague: Rathenau Instituut 2008, p. 9.

⁵ http://www.europarl.europa.eu/stoa/events/workshop/20090224/background_en.pdf.

⁶ Professor Kevin Warwick was the first to experiment with RFID chips (Radio Frequency Identification) (1998); the company *Verichip* has been selling RFID implants in the United States since 2004 for patient implantation in hospitals for rapid identification. (Source: <http://www.technovelgy.com/ct/Science-Fiction-News.asp?NewsNum=199>). At the “Baja Beach Club” in Barcelona, VIP clients pay automatically for what they consume using a chip implant for identification (BBC News 29 September 2004: <http://news.bbc.co.uk/1/hi/technology/3697940.stm>).

⁷ An intraocular retinal prosthesis uses an external system to capture and process the image data and then send the information to an implant. The implant then decodes the data and stimulates the retina with a sort of electrical pulse to produce perception. ©USC BMES, http://bmes-erc.usc.edu/research_programs_retinal.htm.

- ⁸ Note that certain statistics try to assess the development quality of countries based not only on 'hard' concepts such as GDP, but also taking into account data such as the level of child education and access to quality healthcare. A 'human development index' for societies is one such approach to the concept of holistic human development.
- ⁹ The theme is far from new! In 1748, the doctor and philosopher Julien Offray de La Mettrie had already published a work entitled *L'homme machine*.
- ¹⁰ Encyclical letter "Caritas in veritate" of Pope Benedict XVI, p. 74. "A particularly crucial battleground in today's cultural struggle between the supremacy of technology and human moral responsibility is the field of bioethics, where the very possibility of integral human development is radically called into question. In this most delicate and critical area, the fundamental question asserts itself forcefully: is man the product of his own labours or does he depend on God?"
- ¹¹ Cf. T.L. Beauchamp and J.F. Childress, *Principles of Biomedical Ethics*, 6th Edition, New York/Oxford University Press, 2008.
- ¹² In particular we must ensure that human capacity enhancement is not sought for the benefit of third parties (increasing productivity for the benefit of industrial firms, acquisition of new attributes for military purposes, etc.).



Chapter 19

RETURN TO THE GARDEN OF EDEN (ESSAY ON POSTMODERNISTIC THEOLOGY)

by Bishop David Perović

RETURN TO THE GARDEN OF EDEN (ESSAY ON POSTMODERNISTIC THEOLOGY)

by **Bishop David Perović**

In this summary we would like to draw the attention of the reader to a study made in the Serbian language to which a link can be found at the end of this piece.¹ In the study, named *Themes of Biblical-Hymnographic Ecology*, we concentrate on the human being himself, the human being of God's companion, the human being as our brother in nature. The focus of this study is on how the human being takes off the dress of light God originally intended him to wear, and on how he dresses up in leather garments, configures and endues the synthetic clothes and puts on the metal armour.

From the beginning, the human being is a saint cleronomy (i.e. inheritance) of God. He will remain so until the end of the global village and its *fiestas*. Until the end, the human being is intended to have the freedom and possibilities of transformation in the way between the God-man and the man-God, a son made possible in Christ and communicant of divine nature and *technotron*, cyborgs, and cyber-man and technological and chemical benefits. At the epicentre of this work are ethos and the tradition of turning our eyes towards the Orthodox vision of God and knowledge of God. At its basis are ethos and the tradition of a calm and afflicted looking at the ego. The key to understanding this study, its methodology, and its structure, should be found in the neo-patristic synthesis theology and its methodology.

The beginnings of our eco-ethical and bio-ethical odyssey, filled with trauma and complexity, reaches up to Patrology, and to the expulsion of our first parents from the Garden of Eden. On *Sunday Cheese fare* (also called, 'forgiveness Sunday') we remember all of the key and fatal effects of Adam's expulsion from Eden because of his disobedience: he is deprived of heavenly sweetness, deceived by the word, standing in front of the Paradise in nakedness, and sobbing because of the immediate loss of everything, that is to say clothing, the light or *entity of glory*. One of our main themes is that the Orthodox service book *Lenten Thriodion* can serve as an original book about eco-ethics and bio-ethics, bio-ascetics and bio-aesthetics.² *The Palm Sunday Thriodion* can serve as an original book about paschal contemplation of substance and being, wellbeing and eternal-

wellbeing. Only after joyfully receiving the Testament of Lent, does it become clear that we would not have experienced the expulsion from Eden if Lent had been retained by our father Adam. The Psalms are one of the oldest types of narratives and prayers. They contain expressions of thankfulness, confession, didactics, prophecy, festive jubilation and lament. They also cover all types of conditions and movements of the soul: fear, anger, irritability, despondency, sadness, worry. Everyone can find an adequate and fortifying Psalm for herself or himself in his or her present situation.

In addition, we critically explore the vocabulary used in discussions about prenatal children and children born with a disability. This vocabulary illustrates that every remotely conceivable saga about a human being begins and ends with the words, expressing a too limited anthropological classification: being non-human, sub-human, towards-human; human, above human, super-human. Other words, however, are missing in the list, such as: complete man, saint, God-child, God-human. The planned destruction of embryos, in a legalized and non-legalized way, remains for us a criminal act, irrespective of the means of doing it, starting from the most primitive one toward the most sophisticated technology. It is the most monstrous and executed murder ever imagined.

Besides, we also develop the idea that in the beginning was the digital word. Then we find a giant document or a recipe of extraordinary length. It fits within the tiny microscopic cell nucleus, which can be easily placed on the head of a pin. It is written in the genetic language, telling the story of all the genetic changes and inventions that characterize the history of our species and its ancestors from the beginning of life. In summary, the genome is a sort of autobiography of our human kind, where important events are recorded in a certain order. It would be unnecessary for the ranks of the Christians to panic because of evolutionary intoned statements by practitioners and theorists of genetics, that what we call a person is in a large part a question of brain chemistry!

Our work ends with the viewpoint of a psychiatrist, Dr. Marie-Bruno Dominique, expressed in the words: God is at the crossroads. She asks questions about all the drama of the world addressed through the idea of *Homo technicus*: *Who am I? Who are you? Who are we?* Internet, virtual world, virtual economy of salvation and bliss! What does the virtual future bring to us? The Second I, the virtual myself! The patient requires therapists to be persistent in their personal development, as well as in their relationship with the patient. Psychotherapy aims to create a space for a renewed life and, if necessary, to be by itself a precursor to the spiritual life. *Prepare the way of the Lord, make straight His paths.*

- ¹ The full name of the study: *Themes of Biblical-Hymnographic Ecology, Bioethical Technology and Genetic Surgery with Virtual Design: An Essay on Postmodernistic Theology*. The link to the text in Serbian: http://csc.ceceurope.org/fileadmin/filer/csc/Ethics_Biotechnology/Human_Enhancement_-_Bishop_of_Krusevac_s_Diocese.pdf
- ² The *Lenten Triodion* is the service book of the Orthodox Church that provides the texts for the divine services for the pre-Lenten weeks of preparation, Great Lent, and Holy Week. Http://orthodoxwiki.org/Lenten_Triodion.
The Lent or Great Fast is the period of preparation leading up to Holy Week and Pascha.

Chapter 20

BETWEEN MERE OPPOSITION AND DULL ALLEGIANCE ENHANCEMENT IN THEOLOGICAL ETHICAL PERSPECTIVE

by Stefanie Schardien

BETWEEN MERE OPPOSITION AND DULL ALLEGIANCE ENHANCEMENT IN THEOLOGICAL ETHICAL PERSPECTIVE

by **Stefanie Schardien**

How does Protestant Theology react, or ought it to react, to the ethical challenge of enhancement techniques? After exploring the general affiliation of Christian eschatology to the idea of enhancement, the chapter goes on to analyse common theological strategies in confronting, or indeed mainly rejecting, this area of biotechnology. Over against simplifications and generalizations it is fair and necessary, as the reflections prove, to differentiate more between the various kinds of enhancement and to judge them on a case by case basis. Finally, the article identifies individual and social ethical criteria which can serve to bring about a sound theological discernment.

20.1. Introduction: Christian longing for the Enhancement of Life

"He will wipe every tear from their eyes. Death will be no more; mourning and crying and pain will be no more, for the first things have passed away." (Rev 21,4)

Christianity has a lot to say about the 'improvement' of life. Semantics of increase underlie the Christian expectation of salvation: eternity is supposed to be better than the present existence – even if there is no definite answer yet of what this 'better' will mean. The bible is full of images and stories which tell us about a life richer and fuller, about growth and completion, about the Christian longing for the better. From biblical visions like the one quoted from the book of Revelation some theologians go so far as to interpret biotechnological enhancement as a necessary human step in the history of salvation. According to the US-American professor for systematic theology, Ronald Cole-Turner, humans after the fall, suffering from shortcomings like anxiety, limited knowledge or fading youth, are supposed to regain their lost creational nature. Traits originally intended by God for humanity should even be exceeded when compared to Adam and Eve.¹

One can object that this is a misreading of biblical texts. Many of them, of course, primarily relate to spiritual well-being or speak in metaphors of the eternal in contrast to earthly life. At the same time, however, some of them clearly express their longing

for a relief of sorrows and distress which is not supposed to be postponed until eternity. Their hopes for a life in beauty, joy and satisfaction do not contrast earthly desires but rather draw on what humans wish for in this world and time. Their hopes do not only refer to an 'unreal,' future life. In continuity to life here and now, these hopes are supposed to mean something to this life and to touch the whole existence, including body and soul.²

What this brief introduction shows: ethical arguing with biblical ideas remains difficult. However warranted one may be in interpreting texts as pictures of spiritual or future well-being, one can hardly deny a specific Christian affinity to the 'enhancement of life' here and now. Some will still argue that the Christian ideas of enhancement are not fitting to 'enhancement' as the term is used today. But what is the term 'enhancement' actually meant to describe?

20.2. Necessity of Differentiation

The English term 'enhancement' has played a powerful role in bioethical debates for several years now. In German-speaking discussions, and probably in other countries as well, the use of the English term conveys the impression that 'enhancement' is a definite subject to deal with, like 'organ transplant' or 'abortion.' Translating the term 'enhancement' as 'fostering,' 'strengthening,' 'enforcing,' etc., reminds us, however, of the broad range of possible actions which the term can include and which will be judged quite differently.

The scale can be set from so-called 'gene doping' (for example, stimulating the bodies of sportsmen and -women to produce more oxygen or more muscles) to make-up (enhancing one's physical appearance), from pharmacological neuro-enhancement (increasing the intellectual or emotional sensitivity) to special diets (increasing the ability to concentrate or conquer fatigue).

The question of enhancement differs from the well-known ethical and conflictual discussions on the beginning or the end of life and draws its public power and its challenging nature from its generality. Not every one of us makes use of in vitro fertilisation and not everyone needs to decide about assisted suicide. But almost no human being would not occasionally (or even frequently) resort to enhancing means and methods of some kind. The will to 'improve' – be it in one's physical fitness, beauty, or in mental power – accompanies human life. Many kinds of 'enhancement' seem to be beyond dispute: who would tell their children that it is a problem to learn how to use the computer much better and much earlier than other generations did? And who would forbid running teams to train in high altitude camps to improve their endurance? Yet, other kinds of enhancement appear more challenging, especially when it comes to the use of pharmaceutical products or of other medical means.

Bettina Schöne-Seifert and Davinia Talbot differentiate between four categories of enhancement: *physical enhancement*, like doping in sports or aesthetic surgery, *neuro-enhancement*, like mood lifters or the so-called 'happy pills,' enhancement at the *beginning* (via PID), and, lastly, enhancement at the *end of life*, i.e. increasing the life span.³ Within each of the categories, it seems, there is a smooth transition from *desired* forms of enhancement via *accepted* and only *tolerated* types to, finally, *disapproved* forms of enhancement. The ethical challenge lies in analysing how these implicit distinctions are drawn and in developing criteria for a sound evaluation.

In the following sections, arguments from the angle of theological ethics will be explored. While considering both individual as well as social ethics, the latter, as will be demonstrated, seems to lead to more substantial arguments for the current discussions on enhancement.

20.3. Theological Opposition: the Preservation of 'Human Nature'

Regardless of the above-mentioned diversity of enhancing techniques, one can often observe a rather general, undifferentiated opposition of theological ethics to it. One of the main arguments, if not *the* main argument, from which ethical implications are drawn, is the following: enhancement distorts human nature which is given, created, or intelligently designed by God. With a slightly different emphasis this argument normally begins by taking a specific Christian 'image of humans' for granted, an image characterised by a notion of naturalness. According to this perspective, human nature has to be protected from an artificiality which is understood to threaten life. Over against God's creational activity humans are supposed to accept their natural abilities and especially their limitations since both are perceived to be God's gifts. Hence, enhancing techniques appear as the outcome of human *hubris*, as a shortcoming of fallen nature, as sin. The discussion document of the Conference of European Churches (CEC) on enhancement also basically follows this path.⁴ Starting out by affirming that the Christian belief does not object to human technological activity *per se*, the document focuses on exploring the line between acceptable human activity and disapproved enhancement. The distinction between 'natural' and 'artificial' plays a pivotal part in this argument.

The authors first claim that enhancement techniques have nowadays entered a completely 'new stage': whereas in former times humans only 'changed the world *around* them' but not themselves, they are now trying to change the human being itself.⁵ Although the differentiation between *external aids* and *internal changes* to the body has some intuitive appeal, it loses much of its validity in the light of some factual and historical observations. There is no doubt that technical devices, such as extended 'computer brains' and various

methods of mobile communication, *did* in fact change the human being itself. The idea that this type of enhancement can be put down again is a rather theoretical one, especially when taking into account the social pressure to use these technical devices. Moreover, the document's assumption can be challenged that humans in former times did not try to change themselves. Did not Chinese women bind their feet so that these stayed even too small to walk on? Did not many young women in the 1960s follow beauty ideals of the slimming crazes? Did not already in classical times athletes try to increase their strength with the help of diets? Have not men and women in all times tried to make their 'natural' skin either more tanned or as pale as possible? All this demonstrates that the will to enhance and change the 'natural' being is hardly new.

Secondly, along with many ethicists, the CEC-document bases its conclusions on a distinction between *enhancement* and *therapy*. Prominently presented by the US President's Council on Bioethics in its statement *Beyond Therapy*, this differentiation is plausible on a first level, defining both actions from a notion of 'normality' – again closely connected to a supposedly given 'human nature.' Medication and therapy restore normal functioning to sick people whereas enhancement drives healthy people 'beyond this normality.' Points of critique of this argument can be heard from various sides, though. Already a quick look at the historic development of medicine and therapy illustrates the contingency of the concepts of 'disease' and 'normality.' In one of the early articles on enhancement, Eric T. Juengst states in 1998: "It is not quite difficult to invent new sufferings in order to justify enhancement-interventions"⁶ Beyond the irony: what is perceived as a 'normal part of limited life' and what is described as a disease or a medical problem to be 'fixed' can not only be attributed to 'inventions' but even more to social, historical and cultural factors. This insight points to more than just a 'grey area' between the two supposedly clear cut opposites of therapy and enhancement. Without any doubts there are, of course, actual meanings of the terms, 'sick' and 'normal' or 'better than well' today. However, it is necessary to highlight that one cannot deny the continuous changing of these concepts, including even the perception of real physical or mental pain. Or to put it another way round: one should exercise care in asserting a largely pre-determined understanding of 'normality,' 'health,' and 'disease' as the standard for a human nature, as it were, to be preserved.

These few examples show the difficulty in drawing on these dualistic differentiations in order to find powerful arguments against the use of the very general idea of 'enhancement.' Much of what humans do or use today could have been called 'enhancement' from an earlier point of view. Some decades ago much of what is described as a medical problem that can be healed or prevented (like depressions or dementia), would have been considered part of the normal course of life.

At the same time, looking more closely at the visions that are nourishing theological fears of a threat to human nature, the enhancement report of the German Institute for Technology Assessment damps down the debates. It convincingly demonstrates how unrealistic the predicted horror scenarios of an alienated human nature are. Resulting from an analysis of several studies, the report states: "Realistically, the prospects for an implementation of according visions of utopias as well as dystopias appear unpromising. Scientifically based and plausible scenarios for a lasting, deliberate manipulation of 'human nature' by pharmacological substances without effects on the genetic, hereditary level do not exist".⁷ According to this analysis there are no realistic objectives with regard to genetic manipulation, nor for physical performance or for mental, cognitive or emotional abilities or performance because the genetic basis is still largely unclear.

20.4. Criteria against Simplifications

20.4.1. Individual Ethical Arguments

On the one hand, the attempt to fundamentally oppose 'enhancement in general' by drawing supposedly clear distinctions between 'external' and 'internal' and between 'therapy' and 'enhancement' seems to be unconvincing. On the other hand, uncritically glorifying the supposed successes of enhancement methods appears equally unconvincing. Instead of these two options the ethical discernment will benefit more from the so-called middle axioms which present a viable alternative. Beauchamp and Childress have provided us with the four 'principles of biomedical ethics':⁸ beneficence, non-maleficence, autonomy, and justice.

Especially the principles of beneficence and non-maleficence are to be understood from an individual ethical perspective. Their main question in short is: is enhancement doing good or at least not doing harm to the individual? Whereas those advocating enhancement like the English utilitarian philosopher Julian Savulescu insistently stress the general benefit of all kinds of enhancement techniques and take the negative effects as minor losses, the objectors – hardly surprisingly – either see that even minor losses are not acceptable or they evaluate the harmful effects as being much bigger.

Risking the individual's health seems to be the strongest argument against enhancement when it comes to the use of pharmaceutical products or – in the far future – possible genetic manipulation. Obviously, harmful side-effects can at present not be avoided which prevents many from making use of, for example, neuro-enhancement. A recent study among German students has shown that only a very few of them are willing to take, or have already taken, stimulants intending to improve their mental abilities. Yet, 80% would be ready to take these drugs if they had no side-effects. The number of people

willing to risk their health by neuro-enhancement drugs increases distinctly as soon as one observes the attitude in other countries (like the U.S), the practice of working adults or especially of athletes in the area of highly competitive sports.¹⁰

At this stage, if side effects are unavoidable, theological ethics (and a Protestant ethic in particular) presses for transparency and clarification so that people can make their own informed decisions. If vulnerable people like children are involved and possibly threatened there is a special need for caution. But this remark already leads on to the principle of autonomy to which I will be coming back shortly.

If at some point side-effects will have been abolished, 'health risks' will no longer serve as an argument. To evaluate 'objectively' if a certain enhancement is doing good or harm will then be an even more difficult task. For as briefly outlined before: allegedly objective concepts of 'normality' as a benchmark do not work. If we ask people who use methods of enhancement, they will certainly claim to suffer from some kind of physical or mental deficiency which they try to remedy: the professional musician will explain that he is afflicted with shaking hands during a concert, doctors complain about being tired on the job, women suffer from their wrinkles, men from a lack of strength etc. Who would dare to tell these people that their suffering does not actually exist? Protestant ethics especially is very careful about dictating what is to be perceived as pain or suffering and refrains from judging the individual for his or her feelings and perceptions. Yet, on a social ethical level, it can ask: where do these feelings come from? Which social structures make people see themselves as deficient and foment the urge to enhance their body or brain?

20.4.2. Social Ethical Arguments

The third of the aforementioned four principles of biomedical ethics, *autonomy*, usually features in the context of individual ethics. In terms of individual ethics one can reason: the individual's decision for personal enhancement can hardly be forbidden unless there are side-effects which tend to be so harmful that people have to be saved from themselves by law. Much more interesting, however, seems to be the social ethical discussion about what 'autonomy' really means in societal structures where specific methods of enhancement are well-established. The liberty to reject these methods dwindles and the inhibition threshold to use them lowers. Therefore, theological social ethics can stimulate discussions on questions like: is it desirable that a certain enhancement technique becomes the norm? (This is in fact more than a rhetorical question. We may at some point conclude that some kind of enhancement is desirable.) What does the individual, what does society gain, but before that: what might they *lose* if a certain technique becomes the norm? Since Christian theology rather favours the manifoldness and colourfulness of life, its ethics will definitely have a healthy scepticism at this point. Unless there are strong and striking

reasons to reduce the number of choices by supporting a certain enhancement technique to become the social standard, Christian ethics will tend to strengthen the plurality of choices, of *real* choices which at the same time strengthens autonomy.

The fourth principle, *the principle of justice*, proves to be especially relevant here, since it addresses the social implications and injustices of enhancement. According to the CEC document a major danger of enhancement is increasing injustice between the haves and the have-nots.¹¹ Up to a certain point this is an important and necessary warning. The fear is that biotechnological means will only be affordable by or accessible to a few. While this problem already concerns the close range of societies, ecumenical ethics especially will keep the global balance in mind: will certain enhancement techniques widen the gap between the Northern and the Southern hemispheres? Where sport is concerned some liberal philosophers avail themselves of the justice argument: according to them doping should generally be allowed because as long as it is forbidden those athletes not using it are disadvantaged.¹² If liberal thinkers wanted to carry this idea to its extreme they could even argue that here the global gap has a different slant: European athletes especially 'suffer' from a strong doping control system compared to that in Africa or Asia... The CEC document sends out the opposite message: it considers the possibility of injustice a strong argument *against* the deregulation of enhancement. When only a few benefit from enhanced abilities and they are thus advantaged, Christian ethics has to express its concern about justice, in particular about justice for those who are already disadvantaged in life. The CEC document, I am convinced, is right in this: theological ethics has to stand up for the disadvantaged.

Still, different conclusions may follow from this 'preference for the disadvantaged.' Not only may 'enhancement' refer to a variety of means and methods, but each kind of enhancement can also be used with different intentions and for different purposes. We can therefore identify at least two scenarios – with corresponding roles for theological ethics. The first is that enhancement techniques (after public and political discourse) gain public approval. In this case, theology and churches can either accept that these techniques will not be accessible to everyone (and, for example, insist that the few will at least use them for the benefit of the many); or they can support the disadvantaged in gaining access too. Comparable initiatives can be found with respect to computers, education, and medicine: their enhancing benefits were reserved for 'the few' in earlier times but in the meantime it is a common conviction that these benefits should be made generally available. *Secondly*, in the case of enhancement techniques that do not gain public support, theological ethics and churches should speak up. Especially if the specific enhancement technique is threatening the so-called 'have-nots'. If it is widening the gap

between the advantaged and the disadvantaged, then this serves as a strong argument against this kind of enhancement.

20.5. Between Mere Opposition and Dull Allegiance: Some Conclusive Remarks

One of the strongest disadvantages of the enhancement techniques seems their tendency to reduce perspectives and solutions. They identify a certain problem and offer a certain solution. A contribution from theological ethics could be to question both problem and solution. A simple example may serve to illustrate the point. Some studies have shown that less handsome children are more often mistreated than their good looking peers. A simple enhancement solution would be to make the less handsome more beautiful. But would this not imply that it is in a certain sense 'fair' to discriminate against unfortunate children? It does not take much to discover alternatives to the interpretation of the problem as well as of the solution. Theology and churches can challenge one-dimensional interpretations.

Yet this may not only lead to criticising the enhancement techniques themselves. One may equally want to explore the background circumstances which generate a demand for different kinds of enhancement. Instead of just accusing pharmaceutical companies offering neuro-enhancement, surgeons offering facelifts, or those accepting these offers as serving the wrong master, it seems worthwhile to analyse how the social, professional, and media systems foster these needs. Enhancement no longer appears as a problem which others can be blamed for but much more as a phenomenon arising from the systems themselves. Assessing the question of enhancement from this perspective means abandoning the role of passive observers (or accusers). It means instead making use of the possibilities available to take part in creating, shaping or sometimes changing the social systems and to engaging in public dialogue. Remembering again the low probability that futuristic enhancement techniques will be realised, there is a fair chance of, for example, promoting alternative, more social ways to enhance life. This kind of enhancement is not only more realistic but it is also easier – and up to now healthier – to attain. Coming back to the more or less exaggerated examples one could argue: instead of facial surgery for the less handsome kids, raising the awareness of the teachers and helping them to discourage this discrimination might be a more plausible solution. Instead of fighting neuro-enhanced top workers, discussions about a desirable company culture or political efforts to reduce the fight for jobs would enhance our working system. Most probably it would also enhance the economic output.

Theological concepts (like those presented by Ulla Schmidt and Janne Nikkinen in this volume) can enrich these public discussions about the 'enhancement of life.' As stated at the beginning: Christianity has much to say about how life can be improved and about

how life can be enhanced. Although it will not parrot societal ideas and political agendas, it might and should find points of contact. The following Christian beliefs only point out some of the many links to the public sphere:

- The Christian ideas of power and weakness might invite one to leave the well-trodden paths of actual trends. Believing, for example, in a God who made himself known in this world as a small child and, finally in his suffering, questions many worldly ideals.
- Supporting the integration of all people (especially giving voice to those in the margins), the Christian view will probably widen the understanding of human achievements that could also be worthwhile aims. For example, Christian communities have a long history in highlighting the special abilities e.g. of children or handicapped people, like spontaneity, gentleness or persistence.
- And with regard to the final aims of life, Christian theology can help thinking about how earthly desires relate to eschatological hopes.

Taking seriously what Celia Deane Drummond says with regard to the transhumanism debate, “human beings are agents of their own destiny”,¹³ means stepping back a little from a ‘them-versus-us’ discussion and rather understanding oneself as a member of the same social structures. Keeping open the choice of alternatives for life, widening the perspectives on life can be best reached by what the former head of the EKD-Council, Wolfgang Huber, and the Bavarian Bishop Heinrich Bedford-Strohm call ‘public theology’.¹⁴ Instead of a fundamental opposition to social or biotechnological trends, public theology implies active political and cultural involvement of churches and politicians. It means addressing the public, fostering social dialogue and trying to reach the decision-makers in the public sphere. Last but not least: the concept of public theology demands that theology and churches themselves enter these public discussions open to other perspectives and without prejudices which are too general for an ethical issue which covers a wide range of measures. If churches and theology consider the conflicts of enhancement as attentively and carefully as described, they will most probably not provide the ethical answer, but they are likely to enhance the debates on it.

- ¹ R. Cole-Turner, *Human Enhancement and Christianity: A Case of Friendly Fire? Lecture at the Oxford Uehiro Centre for Practical Ethics* (27.01.2009), <http://www.podcastdirectory.com/podshows/10180246> Last visited Sep 6, 2012.
- ² Cf. S. Schardien, "Sehnsucht nach Mehr. Gentechnologisches Enhancement und theologische Eschatologie im Vergleich," in: S. Körner S and S. Schardien (eds.), *Höher, schneller weiter. Gentechnologisches Enhancement im Spitzensport*, Paderborn, 2012, pp. 305-25.
- ³ B. Schöne-Seiffert and D. Talbot, *Enhancement. Die ethische Debatte*, Paderborn, 2009.
- ⁴ Conference of European Churches, Church & Society Commission 2010: *Human enhancement. A Discussion Document*. http://csc.ceceurope.org/fileadmin/filer/csc/Ethics_Biotechnology/Human_Enhancement_March_10.pdf
- ⁵ *Ibid.*, 2.
- ⁶ E.T. Juengst, "What Does Enhancement Mean?", German version, in: B. Schöne-Seiffert and D. Talbot, *Enhancement. Die ethische Debatte*. Paderborn, 2009, pp. 25-45, here p. 31.
- ⁷ A. Sauter A and K. Gerlinger K (Büro für Technikfolgenabschätzung beim Deutschen Bundestag), *Pharmakologische Interventionen zur Leistungssteigerung als gesellschaftliche Herausforderung* (Arbeitsbericht 143), Berlin, 2011, p. 195.
- ⁸ T.L. Beauchamp and J.F. Childress, *Principles of Biomedical Ethics*, 5th ed., New York, 2001.
- ⁹ J. Savulescu, Interview with Julian Savulescu on 'Designer Babies' in the series 'Bioethics Bites' (29.09.2008), <http://media.philosophy.ox.ac.uk/bioethicsbites/Savulescu.mp3>. Last visited March 21, 2013.
- ¹⁰ A. Viciano "Da macht unser Gehirn nicht mit." Interview with Klaus Lieb, *Zeit-Online* (10.03.2010), <http://www.zeit.de/2010/11/M-Neuro-Enhancement> Last visited March 21, 2013.
- ¹¹ Conference of European Churches / Church & Society Commission, *Human Enhancement*, p. 12.
- ¹² Cf. B. Foddy and J. Savulescu, "Ethics of Performance Enhancement in Sport: Drugs and Gene Doping." German version in: B. Schöne-Seiffert and D. Talbot, *Enhancement. Die ethische Debatte*. Paderborn, 2009, pp. 93-113, here p. 111.
- ¹³ C. Deane-Drummond, "Taking Leave of the Animal? The Theological and Ethical Implications of Transhuman Projects," in: R. Cole-Turner, *Transhumanism and Transcendence. Christian Hope in an Age of Technological Enhancement*, Georgetown, 2011, pp. 115-30, here p. 126.
- ¹⁴ Cf. W. Huber, *Kirche und Öffentlichkeit*. Stuttgart 1973; H. Bedford-Strohm, "Öffentliche Theologie in der Zivilgesellschaft," in: I. Gabriel (ed.), *Politik und Theologie in Europa. Perspektiven ökumenischer Sozialethik*. Mainz, 2008, pp. 340-66.



Chapter 21

HUMAN ENHANCEMENT AND THEOLOGICAL PERSPECTIVES

by Ulla Schmidt

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This chapter asks what it implies for the understanding and articulation of the ethical question of human enhancement to look at it from a theological perspective, especially in terms of critical and constructive reflections from a Protestant tradition. Three perspectives or complexes of issues are developed as being particularly pertinent: a) How one understands creation and its relation to nature and divine agency, b) the role of human agency and character connected to this, c) human community, and how it might be affected by human enhancement.

21.1. Interpreting Human Enhancement

Ethical, legal and political questions regarding issues such as human enhancement are inescapably embedded in and interact with more comprehensive images and conceptions of human existence, life and nature, and their relation to other parts of reality. Such ethical questions can hardly be formulated or responded to without tacit or explicit reference to broader assumptions or ideas regarding human life. Basic ideas and images of human existence and human life are dealt with in cultural expressions and symbolic systems, such as arts, religions and worldviews, language, education and formation, and they are studied and critically reflected upon in disciplines such as philosophy, history of ideas, and theology.

This article addresses human enhancement from a theological perspective. It aims to explore the meaning for human enhancement of central dimensions of the Christian faith, mainly as they are formulated and perceived in the Protestant tradition. Without the ambition to be exhaustive, we will explore three perspectives (or complexes of issues) which are especially relevant as broader perspectives or interpretative frameworks for questions of human enhancement. These are *creation, nature and divine agency* (section 21.2.), *human agency and character* (section 21.3.), and *human community* and how this community might be affected by human enhancement (section 21.4.).

As is the case for other controversial issues, the question of how to define 'enhancement' is itself part of the controversy. Several variables go into and form the definition of 'human enhancement.' One variable is the means used to achieve enhancement, for example whether the intervention entails irreversible changes (as is the case in genetic modification

and in some cases of surgery) or reversible changes (such as the implant of mechanical devices, drugs). Another variable is the purpose of human enhancement, especially to what degree it changes the way a human functions, how this relates to known features and variations in human nature, and how it involves a certain view of human nature: does the definition include ideas of a 'normal' or 'typical' level of functioning of human nature? Examples of the concrete ends of human enhancement as currently discussed are the enhancement of cognitive abilities (such as memory), physical capacities, or physical qualities (such as height, muscular capacity or eyesight), as well as extended longevity and an enhanced immune system.

Although there is no unanimous definition of 'human enhancement' abstract from the actual discussions of the question itself, it is necessary to have some kind of preliminary idea of the phenomenon in question. For this purpose the rather pragmatic definition offered in the CSC's discussion document from 2009 will serve.¹ Here human enhancement is described as "ways to make functional changes to human characteristics, abilities, emotions and capacities, beyond what we regard today as normal, using advances in biology, chemistry, physics, materials, information technology and the mind sciences"² An advantage of this definition is that it contextualizes the notion of 'normal' by linking it to the perception within a given group at a given time ("what we regard *today*"), rather than referring to supposedly timeless essentials. However it does not address whether 'normal' refers to the known span of possibilities for the human species (where changes 'beyond what is normal' would also imply so-called post- or transhumanist changes), or whether it refers to what is typical or 'average' either for the human species, or for a specific individual. The present chapter will mainly have the two latter forms in mind, and does not address the particular questions associated with transhumanism.³ This understanding of human enhancement does not draw a sharp and definitive line between enhancement and medical therapy. But the fact that it leaves a grey area does not mean that the possibility of distinguishing two categories should be rejected altogether. It merely says that there will be some actions that do not readily fall into one or the other category.

These introductory remarks concerning human enhancement also caution against speaking of human enhancement in a too general manner, as one homogeneous category of actions that can be evaluated simultaneously. Human enhancement, as the term is often used, comprises a diverse set of intervening practices, different both with respect to the ends pursued and the means used to achieve them. Although they have different implications, the following perceptions are relevant to all.

21.2. God's Creation and Natural Order

The understanding that the starting point for all human life, practice, and action is God's continuous involvement with the world and with human life through creative and redemptive love is essential to Christian faith and tradition, and constitutes a focal point for Christian theology. Having been created in the image of God, human beings live from God's gifts and are called to live responsibly in relation to the world, others, and themselves. Moreover, human life is fulfilled by being united with Christ through the grace of God, not through one's own accomplishments. According to a classic Lutheran formulation, Christians are defined by a dual characteristic: they are free from the requirement of justifying and fulfilling their own lives and persons through their own achievements or innate capacities. At the same time they are bound to serve their neighbours in love and charity.

Human agency is therefore basically understood as situated within, and being part of, a reality viewed as God's creation and thus accepted as good. Identified as God's creation, reality is not simply raw material that is valuable only in terms of its usefulness for human purposes and intentions. Value is not imposed on reality by the human will, its preferences and desires. Rather, value is already inherent in reality – by virtue of God's involvement with its creation. This includes human life and the human body: their value does not depend on their instrumental utility for further ends, such as the experiences of happiness or pleasure, nor should the body be used purely as a means for such further ends.⁴

A Natural Order?

A widespread type of objection against human enhancement is that, by trying to improve the normal functioning of a system, human enhancement represents an intervention in human nature and violates a natural order or purpose. From a theological standpoint this objection is often associated with the view that the notion of creation imposes limits on the range of acceptable interventions. Through the act of creation, so goes the argument, God lays down a certain order or purpose in nature. This order and these purposes should be obeyed and respected by humanity as they have been willed by a loving, divine will. Changing or intervening in the normal functioning of natural systems would violate rather than respect this divinely willed order in nature. This raises two interconnected issues. One has to do with the understanding of creation, God's creative agency, and the fulfilment of creation. The other issue concerns human agency and human participation in creation and creative processes.

The idea that nature and natural processes contain an inherent order is linked to a certain theological view of creation. Here, creation is viewed as a divine act through which God by bringing forth and sustaining a natural world and life, lays down a given order or set

of purposes in nature. First, some thinkers within a classical Lutheran tradition argue that these orders and purposes are perceptible in natural orders and in what are considered to be basic human institutions, such as family and marriage, state, and economy. A divinely decreed order can be observed in nature and life as we know it, by virtue of their origin in a divine will. Others claim that this order is only recognisable in the light of God's love as it is revealed in Jesus Christ, so that only in the perspective of God's special revelation do human beings have access to the purposes and orders laid down through creation. Michael Banner, for example, argues in adherence to Karl Barth's thinking that it is in the image of the Sabbath and the affirmation spoken there by the God of Jesus Christ that the orders and purposes of creation can be accessed.⁵ A third viewpoint emphasises how the fulfilment of creation with its inherent goodness and purposes is something that will take place in the future, as an eschatological event. However, Oliver O'Donovan, as a representative of this position, asserts that this fulfilment is vindicated and anticipated upon in the resurrection of Christ. Thus the ordering of creation is present and can be accessed in the belief in and significance of Christ's resurrection.⁶ These positions may thus differ on how human beings can know and recognise purposes or order in creation; still, they agree that the theological notion of creation implies fundamental purposes and a basic order in a reality that originates in God's loving will.

Order or Process?

However, this understanding of a given order and of defined purposes set in motion and sustained through God's creation has for a long time been challenged by views which emphasise God's creation as a continuous process. Celia Deane-Drummond identifies this as a process-theological approach to genetics and ethics, claiming that the idea of 'becoming' (rather than 'being') is at the heart of the interpretation of the relation between God and the world.⁷ There is no fixed ordering in the beginning, neither fully realised nor anticipated as consummated in the future and, therefore, to be known through resurrection. God's creative work in nature is an on-going process of renewal and the bringing about of new realities and new possibilities of life.

Summing up the main features of recent theological positions on creation, David Fergusson points to the idea that creation is understood as imperfect, in the sense that it is incomplete and unfulfilled, yet marked by a pattern of promise and fulfilment, and with a place for God's continuous and on-going creative activity.⁸ He refers to the American Lutheran theologian Robert Jenson who claims that "the world God creates is not a thing, a 'cosmos,' but is rather a history." This dimension of history and change marks the entire creation. History is not something that happens at a stage of an otherwise unchangeable, created and upheld nature. It comprises and includes nature.⁹ Ted Peters asserts that giving the world a future is the fundamental moment in creation, where creation on the one hand establishes continuity from moment to moment, and on the other opens reality

up to newness.¹⁰ The implication is that creation does not imply a once and for all fixed, divinely decreed order that can be observed in nature, either directly or in light of the revelation in Christ.

The Proper Human Response to God's Creation: Co-Creators?

These two different conceptions of creation have implications for a second issue, namely what it means when human beings are called to give a proper response to God and to God's loving involvement with the world and human reality. Most positions in Christian theological ethics agree that ethical reflections on human life, practices, and actions must be oriented towards and take their cue from an understanding of God's relation to, and engagement with human life. However, the meaning and content of what constitutes a proper response will vary significantly, depending on such factors as the understanding of this relation between God and created reality, and on the way human agency is positioned within this relationship.

The concept of creation in terms of divinely decreed fixed purposes and a fixed order is closely intertwined with the view that these orders and purposes represent what Kathryn Tanner labels 'givens' of human responsibility and action. These orders, laid down in the created reality through God's action, should not themselves be subjected to human intervention or manipulation. They represent boundaries or fences for human actions.¹¹ A proper response to God's relationship to human life and reality presupposes that human actions and practices are aligned with and oriented towards these purposes and orders. Human actions and interventions in nature must respect and obey rather than violate these inherent orders of nature and reality. Human enhancement technologies must be understood and evaluated from this perspective.

If, on the other hand, creation is primarily conceived in terms of an on-going, unfinished and evolving process, a proper response to God and God's loving will cannot mean aligning human action with a divinely decreed, fixed order. Instead this response must be interpreted along the lines of relating to nature as dynamic and changing, with a place for God's creative and renewing action and communication. God as creator entails God being related to all there is. This whole includes not only what influences us and poses conditions for human life, it also includes human responses to those influences.

Kathryn Tanner suggests that we abandon the idea of an either/or between human and divine activity and understands God's work in creation so as to include human involvement and activity.¹² This resembles the notion of human beings as 'created co-creators,' used by scholars such as Ted Peters.¹³ Rather than being called to exert responsibility within the limits of absolutes that may never be transgressed, humans should act responsibly and creatively in love and charity towards their neighbours;¹⁴ and rather than viewing the

goodness of nature as a constraint within which human responsibility and action occur, this goodness should be viewed as a dynamic goodness. According to Peters, the very source of goodness is not nature but God. Hence, it is the responsibility of human beings to pursue this divine goodness within the created world by using their own creativity. Phil Hefner, on his part, does not reject that value might be inherent in the processes of nature but he does not see value as confined to those processes. He contends that value can also be found in the new possibilities for the earth, emerging through culture and human enterprise, as well as through novel developments introduced by technology, including genetic technology.

This view of God's relation to reality in creation stresses human freedom and responsibility rather than the duty to respect and act within the boundaries of a fixed order in nature or creation. God's creative action is something which human beings participate in, sharing its purposes while freely and responsibly exploring, utilising and furthering evolving possibilities in life and nature. This opens up a different perspective on human enhancement. The question is not whether human enhancement violates a natural order, but whether it shares in the pursuit of God's creative purposes and improves the possibilities of human life.

Clearly this latter point of viewing human beings as co-creators is controversial. The Roman-Catholic ethicist Lisa Sowle Cahill, for example, although affirming the ongoing, transformative dimensions of creation, asserts that the 'idea of creation' yields an ethics that is, among other things, qualified by restraint. She explicitly rejects the notion of humans as co-creators and claims that human *hubris*, through elevating humans to the position of God's 'co-creator' is responsible for such misguided developments as the ecological crises, grave social injustice, and abuse of natural resources. She sees little promise in raising humanity to the level of being God's co-creators, a metaphor she believes weakens a critical approach to human projects.¹⁵

In fact, viewing human beings as partaking in God's creative action cannot imply that human action and intentions are simply identified with God's purposes. The distinction between misguided *hubris* and participation in co-creation needs to be defined through an incessant process of self-critical ethical decision-making. Such a process must also be sensitive to the effect of self-interest and hubris, rather than by referring to a given, natural order.¹⁶ The implication with respect to human enhancement would be that such practices should not be assessed in general as potential violations of a given natural order, but as concrete practices, according to the ethical and moral ideals of humanity and its responsibilities.

21.3. Human Agency and Character

A second theological dimension or perspective concerns the purpose of human enhancement, namely to improve human functioning and human abilities to pursue one's valued goals and plans – in short, to improve the conditions for human agency. Human enhancement may target and improve cognitive or psychological capacities, physical capabilities, and the human immune system. Clearly, however, all of these are central conditions for agency. In so doing, enhancement may extend the range of opportunities and efficiency of human agency. According to Allen Buchanan, human enhancement technologies may be justified for this reason, because they improve human productivity, which he defines as “how good we are at using existing resources to create things we value”.¹⁷ Increased human productivity, he claims, creates potential for increases in well-being that are not likely to be possible without it. Buchanan rejects what he considers to be a prevalent assumption, namely the idea that whereas the benefits of human enhancement are individualised and personal gains, its risks and potential harm are collective and social. Human enhancement might create social and collective goods, and does so by improving human productivity. It thereby has the potential for ‘large scale increases in well-being.’

Other thinkers object to this form of thinking and claim that human enhancement might in fact alienate us from dimensions of life that are central to the proper functioning and self-understanding of human beings. The American philosopher Michael Sandel has famously asserted that human enhancement estranges us from sensing life as a gift and from being open towards the unbidden. For one, he claims that by achieving through artificial means (such as drugs, technical devices, and genetic intervention) what used to be achieved through an interplay between effort, talent, and powers (such as athletic skills), we no longer recognize how achievement partly depends on what we are given. We come to see it as the result of our own mastery. This is especially the case when parents seek to enhance the qualities of their child through, for example, genetic engineering, rather than receiving the child with openness towards his or her given qualities and features.¹⁸ Jürgen Habermas has voiced similar concerns, claiming that freedom is experienced and played out against a background of something that cannot be subjected to human freedom.¹⁹ Technologies of enhancement alienate us from experiencing life as a gift and thus neglect a basic feature of humanity. This neglect, according to Sandel, is hard to reconcile with the belief that enhancement promotes human agency.

Although these comments stem from a philosophical theoretical framework and are stated in philosophical language, it is easy to see how they might be relevant for theological reflection as well. They correspond with the basic understanding that human freedom unfolds on the basis of conditions that can only be received by the individual and neither acquired nor controlled. According to this line of argument, human enhancement conflicts with the lot of humanity and contradicts its very basis rather than improving it.

Allen Buchanan and others attack this objection, arguing that the allegedly assumed causal relationship between human enhancement and a diminished awareness of life as a gift is unpersuasive. Single isolated instances of human enhancement, such as the over-correction of eye-sight or the use of hormones to increase growth for those of under-average height can, he asserts, hardly be described as attempts at inappropriate mastery and the control of human life and nature, in any meaningful sense of the word.²⁰ Whether this counterargument hits its target, however, remains to be seen. The point raised by Sandel, Habermas, and others is probably not so much that human enhancement causally affects a psychological sense of the value of the gift of life. It is rather that enhancement involves a certain image of humanity itself which – tacitly or openly – redirects basic values or perspectives of the individual in ways that might conflict with other values also perceived as important.

An interesting version of this concern is offered by Gerald McKenny.²¹ Enhancement technologies, he argues, are to a large degree motivated by our wish to remove physical obstructions presented by our bodies to attain our goals and purposes, such as failing memory and impaired mobility. Moreover, they also serve to reduce our dependence on ‘fortune,’ since some of us are born with certain abilities to a much lower degree than others. McKenny admits that trying to overcome these physical barriers through various forms of enhancement is certainly not new. Conscientious study and memorization, or hard, physical training, are examples of practices aimed at improving the performance of the body and to achieve certain goals. However, McKenny’s point is that these ‘traditional’ enhancement techniques require the cultivation of certain virtues, such as moderation or persistence, in order to be successful in overcoming physical and medical shortcomings. They require us to work at ourselves as subjects, our character and our virtues. In contrast, new forms of enhancement allow us to work directly on the body without going via the subject, its character and virtues. The self can attain the desired fulfilment by working directly on or changing the body as a means to achieve the goals.²² As observed by McKenny, this implies a shift in the way we relate to our bodies as we pursue goals.

To give an example, suppose that natural shyness discourages me from engaging in social encounters that I consider important for a fulfilled human life. Now I may try to overcome this shyness by taking a drug rather than by the effort of introspection and personal development. This, then, may alter the value this achievement has for me. Certain goods will change in character, and perhaps even lose some of their value, if they can be achieved through modification of the body rather than through combating this resistance through personal efforts. More fundamentally: the way I relate to my body, with its character traits of introversion and shyness rather than boldness and self-confidence, is clearly different depending on the course of action that is chosen. Moreover this relationship and the

virtue revealed by it might have a value and significance all of its own, which is lost by overcoming the bodily resistance outside of this relationship.

This argument may be relevant in cases where enhancement technology seeks to overcome difficulties that can also be combated through effort and self-reliance. But what if there are physical and mental obstructions which cannot be overcome by personal discipline and effort, but in which enhancement technology may offer a way out? These kinds of enhancement, it seems, must be addressed on other terms. Here the notion of human flourishing, and convictions as to how enhancement may contribute to a good human life come into the picture. A central question in this respect is whether the 'good life' to which enhancement has the potential to contribute is conceived in terms of fulfilment of personal preferences or, rather, in terms of an objective purpose to human life that all human beings are related to and share. The latter is often referred to by the term, 'human flourishing.' Therefore, is the most important question whether or not enhancement enables a more efficient pursuit of individual preferences for a fulfilled life? Or is it rather how enhancement contributes to the attainment of a good human life understood as an objectively given end that is common to and distinctive of human life?

It seems that there is no Christian theological perspective on human life which describes the 'good life' solely in terms of the satisfaction of individual preferences. No Christian view of humanity can do without the notion of a common end that all human beings, created in the image of God and fulfilled by being united with Christ, share in. There will obviously be various interpretations of this common and shared end to human life. But coming back to the theological perspective on human life and action presented at the opening of this chapter, an essential aspect in all those accounts consists in human relationality. This relationality can be described more specifically in terms of living responsibly according to the ideal of neighbourly love. This takes us to the third theological dimension of human enhancement.

21.4. Enhancement and Human Community

How human enhancement might affect human collectives and communities is a vast question that exceeds the limits of this section. A frequent objection to enhancement technology is that it produces goods that are by nature individual, rather than collective. They are what some call 'positional goods,' being only valuable to the individuals who pursue or attain them. Moreover, they obtain their value to the extent to which they are shared only by a limited number of people. They furnish those who have received them with a competitive advantage in relation to the relatively larger number of those who do *not* have this feature or quality. Their value is therefore relative in the context of competition. Enhanced memory or other cognitive skills, as well as personality traits, can

strengthen one's competitive position in the career race, giving one an advantage over persons who have not received enhancement.

This also goes for enhanced physical capacities such as height, physical or mental strength. Set within this context, enhanced features will be goods only to the extent to which they are unequally distributed and the majority of the population does not have them. In this sense some see human enhancement as part of a society offering individuals more effective means of strengthening their competitive position at the expense of the 'non-enhanced.' Enhancements of this kind can hardly be said to contribute to a good life conceived in terms of a community-oriented notion of human flourishing, where serving the other in neighbourly love is an essential and indispensable component.

But it is not obvious that all enhancement goods are positional goods, to be valued solely for their competitive advantage they give. Allen Buchanan suggests human enhancement can be associated with so-called 'network effects'.²³ Unlike the value of positional goods, the value of certain other forms of enhancement increases rather than decreases when more people have them. Buchanan uses the example of enhanced immunity, where the value of enhancement is contingent upon many receiving it. When the number of people who receive the enhancement passes a certain threshold, even 'non-enhanced' persons may benefit from it. Another example could be genetic modification or drugs ensuring more efficient nutrient absorption. In the case of these and other 'network effects,' human enhancement is all but a zero sum game where some lose if others gain.

Moreover, in some cases the evaluation of the good of a certain enhancement as either positional or common according to the network effects, depends on the intention of the person and the context in which it occurs. Drugs to help people coping with sleep deprivation can be used to enhance performance in an academic setting, to the unjust detriment of those who cannot afford them or are unwilling to use such means. But they can also be used to help health care personnel perform better in situations of crisis or disaster, with benefit to the victims. Thus, goods which are the effect of enhancement techniques and which can be channelled through network effects are not necessarily incompatible with a concept of human flourishing, which emphasises serving one's neighbour as an essential ingredient. It is therefore far from self-evident that human enhancement conflicts with a Christian, theological notion of human flourishing, in which a human life is fulfilled not through efforts to save oneself, but through the serving of others in neighbourly love that the love of Christ frees one to do.

- ¹ Cf. CEC, *Human enhancement. A discussion document*.
URL: http://csc.ceceurope.org/fileadmin/filer/csc/Ethics_Biotechnology/Human_Enhancement_March_10.pdf
- ² *Ibid.*, p. 2
- ³ Nick Bostrom, "Dignity and enhancement," in: Edmund D. Pellegrino, Adam Schulman, and Thomas W. Merrill (eds.), *Human Dignity and Bioethics*, Notre Dame: University of Notre Dame Press, 2009, pp. 173-206, here 179.
- ⁴ Dietrich Bonhoeffer, *Ethics*. Dietrich Bonhoeffer Works, Vol. 6., Minneapolis: Fortress Press, 2005. pp. 186-7.
- ⁵ Celia Deane-Drummond, *Genetics and Christian Ethics*, Cambridge: Cambridge UP, 2006, p. 34.
- ⁶ *Ibid.*, p. 35.
- ⁷ *Ibid.*, p. 37.
- ⁸ David Fergusson, "Creation," in: John Webster, Kathryn Tanner, and Iain Torrance (eds.), *The Oxford Handbook of Systematic Theology*, Oxford: Oxford UP, 2007, p. 78.
- ⁹ Robert Jenson, *Systematic Theology*. Vol.2., Oxford: Oxford UP, 1999, p. 14 (cited from Fergusson, o.c.).
- ¹⁰ Ted Peters, *Playing God? Genetic Determinism and Human Freedom*, New York: Routledge, 1997, pp. 14-5.
- ¹¹ Kathryn Tanner, "A Theological Case for Human Responsibility in Moral Choice," in: *The Journal of Religion*. 73, 4, (1993), pp. 592-612.
- ¹² *Ibid.*, p. 604.
- ¹³ Peters, *Playing God*, p. 15.
- ¹⁴ Deane-Drummond, *Genetics and Christian Ethics*, p. 40.
- ¹⁵ Lisa Sowle Cahill, "Creation and ethics," in: Gilbert Meilaender and William Werpehowski (eds.), *The Oxford Handbook of Theological Ethics*, Oxford: Oxford UP, 2005, pp. 7-24, here pp.13- 15.
- ¹⁶ Tanner, "A Theological Case."
- ¹⁷ Allen Buchanan, "Enhancement and the Ethics of Development," in: *Kennedy Institute Ethics Journal*, 18, 1 (2008), pp. 1-34, here p.7.
- ¹⁸ Michael Sandel, *The Case against Perfection: Ethics in the Age of Genetic Engineering*, Cambridge, Mass.: Belknap Press of Harvard UP, 2007, p. 45.
- ¹⁹ Jürgen Habermas, *Die Zukunft der menschlichen Natur: Auf dem Weg zu einer liberalen Eugenik?*, Frankfurt: Suhrkamp Verlag, 2001.
- ²⁰ Buchanan, "Enhancement," p. 24.
- ²¹ Gerald McKenny, "Enhancement and the ethical significance of vulnerability," in: Erik Parens (ed.), *Enhancing Human Traits: Ethical and Social Implications*, Washington DC: Georgetown UP, 1998, pp. 222-237.
- ²² *Ibid.*, pp. 226-227.
- ²³ Buchanan, "Enhancement," p. 10.

Chapter 22

HUMAN ENHANCEMENT BETWEEN THEOSIS AND KOINONIA : AN ORTHODOX PERSPECTIVE

**by Stefan-Ioan Stratul
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Although the transhumanistic issue, as debated today, seems to occupy little space on the stage of current bioethical questions of the Orthodox Church, the Orthodox tradition has set a sound theological framework for reflection on human enhancement – theosis or deification. The concept of theosis, as founded by the early Fathers of the Church (St. Irenaeus of Lyon and St. Athanasius in particular), basically implies that man is seen as body and soul joined together, while human perfection implies the human being in its entirety, as an image of the Incarnated Word, and is mirrored in daily life by the practical concept of koinonia (communion). Both concepts pertain to Eastern Christian theology and anthropology, and both characterize the dynamics of human improvement/enhancement. Thus, theosis (Gr.) – “purification”, and koinonia (Gr.) – “offering” are keywords when it comes to looking at human enhancement from an Orthodox Christian perspective.

22.1. Introduction

It has been pointed out more than once that using technological skills to improve our lives is a specifically human concern, be it manifested through our endeavours to help a fellow human being in need, through our pursuit of a pleasant and carefree life, or through a natural drive to reach our human creative potential to the full.¹ In trans-humanistic terms, human improvement seems to refer mainly to bodily health and to the enhancement of some physical or mental attributes pertaining to a human being primarily perceived as a corporeal entity. Yet even in an utterly positivistic context, which sees a human being as corporeal in all its dimensions, the body cannot entirely be reduced just to this, its physical corporeality.

As Marcel Mauss argued some time ago, “[b]y means of what we do with it, of what we have learned about it and particularly of what is said about it, [...] the body is preeminently the *support* of practices and conceits circulating in the culture of an epoch”.² Thus, the question of human enhancement acquires an important philosophical and theological dimension, whose parameters are on the one hand questioning the limits of humanity, and on the other hand reviving some basic discussions on the nature of the good. Within

these boundaries, the following pages are an attempt to synthesize the doctrine on human enhancement, as formulated in the theological circles of the Early Christian Church and greatly appreciated by the Christian Orthodox Church to the present day. Moreover, the reflection on two fundamental concepts of the Eastern orthodox theology – *theosis* and *koinonia* – and their practical significance when approaching the transhumanistic issue will be discussed.³

According to the biblical and patristic Christian anthropology, any endeavour to define human improvement involves on the one hand the ‘systematic refusal of dualism’ and, on the other hand, the paradox of the Incarnation.⁴ Whether we consider dualism a burden to spiritual evolution, or a means of redemption, in the Bible and in the writings of the Church Fathers the body is always conceived in relation to the soul and in a profound union with it.⁵ As for the paradox of the Incarnation, the fundamental Judeo-Christian texts indicate that as an icon of human perfection, however, the Incarnation of the Word is not necessarily characterised by physical perfection or by exceptional attributes, but, on the contrary, by compunction, fragility, suffering, and last but not least, death.⁶ Therefore, humans are seen as body and soul joined together, and human perfection implies the human being in its entirety, as an image of the Incarnated Word:

“For that flesh which has been moulded is not a perfect man in itself, but the body of a man, and part of a man. Neither is the soul itself considered a part by itself, the man; but it is the soul of a man, and part of a man. Neither is the spirit a man, for it is called the spirit, and not a man; but the commingling and union of all these constitute the perfect man.”⁷

These are words of St. Irenaeus, the famous Christian philosopher of the 2nd and 3rd century. Thus, we could say that human enhancement is in accordance with biblical theology and with patristic anthropology from whose symbiosis results the doctrine of the deification of humans through partaking in the divine nature imparted to them when they receive the Holy Eucharist. By this, the body and blood of the Lord are changed into bread and wine.

Theosis and *koinonia* are two concepts which pertain to Eastern Christian theology and to anthropology, and which characterise the dynamics of human improvement.

22.2. The Meaning of Theosis

Distinguished academic writers have observed that in the Eastern Orthodox tradition *theosis* envisages the human potential for perfection anticipated in ancient Greece, witnessed in the Old Testament and the New Testament, and developed by Christian writers and philosophers in the first five centuries A.D. This view has persisted in Eastern Christianity up to the present day. The basic premise of *theosis* is that God and humanity

have progressively been joined in Christ, reaching a *union* which in the end both blurs and preserves the distinction between the Creator and creation.⁸

The Church Fathers and Christian writers who approached this topic remarked that the deification of humans is closely connected with the significance of the Incarnation of our Lord. As St. Irenaeus of Lyons stated, “He became what we are in order to make us what He Himself is.”⁹ Later on, this idea would be resumed by St Athanasius: “He was made man that we might be made God”¹⁰ Or, “Therefore He was not man, and then became God, but He was God, and then became man, and that to deify us”¹¹ St. Athanasius also said, “[f]or as the Lord, putting on a body became man, so we men are deified by the Word as being taken to Him through His flesh”¹² Through the Incarnation of His Son, God the Father is calling human beings to share His own life in the Son.

However, the fundamental Christian assertion that God is One sets certain limits to the meaning of *theosis*: no created being may ontologically become God Almighty or any other god for that matter. Perhaps that is the reason why mystical Orthodox theologians insist that we humans should retain our full personal integrity, no matter how closely related to God we might be. A deified human being remains distinct (though not separated) from God; moreover, the human being does not cease to be human when he “becomes God.”¹³ This leads us to the realization that for the theologians of the Early Church *theosis* went basically beyond restoring people to their prelapsarian state, i.e. to the state before the Fall of Adam and Eve. These theologians teach us that because Christ in His person united the human nature and the divine nature, we may now experience a closer fellowship with God compared to what Adam and Eve initially experienced in the Garden of Eden; indeed nowadays people may become more like God than Adam and Eve ever could.¹⁴

Thus, Incarnation is seen as a call addressed to the human being to become holy and to seek union with God – beginning in this life and continuing to pursue it until it has been consummated in the Resurrection. St. Justin the Martyr wrote: “[Men] were made like God, free from suffering and death, provided that they kept His commandments, and were deemed deserving of being called His sons, and yet they, becoming like Adam and Eve, worked out death for themselves; [...] yet thereby it is demonstrated that all men are deemed worthy of becoming gods and of having the power to become sons of the Highest.”¹⁵ All of humanity has been utterly restored and helped to reach its full potential because the Son of God accepted to be born of a woman, took upon Himself the human nature and humanity’s sufferings caused by sin, although He is without sin: He is God unchanged in His being. In Christ, the divine nature and the human nature are not two natures, but only one nature; thus, in Christ a union is performed between all of humanity and the Godhead – the divine nature or substance of God, or the Trinity. So, All Holy God and a sinful humanity have been basically reconciled in Jesus Christ “who knew no sin.”¹⁶

The fact that God becomes a human being in order to offer the latter the opportunity to be deified represents a part of the soteriological work through which God has become involved in the restoration of humankind. In turn, humans are called upon to assume responsibility for this reality and carry it to perfection by their actions. The commitment of humans to be responsible for God's restoring work is a necessary method in view of their deification. Indeed, as Emil Bartoş maintained, "Theosis as such is the goal of life; it is the purpose of life – considered achievable only through a synergy (or cooperation) between man's activities and God's uncreated energies (or operations)".¹⁷ Yet how do all these things actually happen? And what would be the role of humans in their own deification?

22.3. Human Enhancement: a Spiritual Process

The Church Fathers and Early Christian Writers describe *theosis* first as a subtle process of interconnectedness and inner mystical transformation of the human being, and second as a sequel to the work of humans. With regard to human actions they mention a few forms of *praxis* – for instance the Eucharist (i.e. partaking of the Holy Sacraments), and living in an ecclesiastic community. In this context, the relationship between God's Incarnation and the deification of humans was closely analysed by St. Athanasius who concluded, "The Word became flesh [...] that we, *partaking of His Spirit* [our italics], might be deified".¹⁸ This practical perspective is the idea on which we base the ensuing section of this contribution.

As already stated, the divine work opens up for humankind the perspective of becoming God. According to the Church Fathers, this perspective implies human endeavours to know God. For instance, St. Clement of Alexandria believed that "[i]f one knows himself, he will know God; and knowing God, he will be made like God".¹⁹ He also specified that such endeavours should be made in obedience to God: "[H]e who listens to the Lord and follows the prophecy given by Him will be formed perfectly in the likeness of the Teacher".²⁰ Moreover, obeying God and doing His will prepare us to cooperate with the divine grace that restores us and enhances us – so that we may become 'partakers of the divine nature' – to use the words of St. Cyril of Alexandria.²¹ It is a goal which can be achieved through our own struggle to match the image of Christ. Without this struggle, there is no real faith – because as we know, faith leads to action; without action, it is pointless.

The Christian Orthodox Church Fathers advised that one should incorporate one's own will, thoughts and actions into God's will, thoughts and actions. A person must mould his or her life to a true likeness of God. Furthermore, since God and humanity do not merely display a similarity in Christ, but rather a true union in Christ, the lives of Christian believers are more than a mere imitation of Christ: they are actually interconnected with the life of God, so that working to one's salvation means being already united with God – Who dwelling now within the repentant, moves him to desire and accomplish that which

pleases Him. This paves the way to the union between God's uncreated energies and humankind, at the same time holding out that since God is transcendent, humans cannot ever get to know His *essence* or be united with it.²²

Therefore, from an Orthodox perspective, human enhancement is essentially a spiritual process. On the one hand, human enhancement presupposes the Incarnation of the Lord; on the other hand, it implies the commitment of humans to seek knowledge of God through obeying Him and partaking of His divine nature – that is, by means of receiving the Incarnated Word not as an information from the outside but through worshipping Him in spirit and in truth.²³ To put it more simply, the role of humans in working to their deification consists in striving to open up to the divine revelation and join its spiritual universe actively and dynamically.

22.4. Humanity Coming to its True Purpose

The human efforts to know God, to receive His will in obedience and to accomplish it, have profound spiritual implications. Revd. Fr. Dumitru Stăniloae describes the process of human improvement as a process of inner purification and spiritual intensification of the human nature. He does this, starting from one of St. Irenaeus' remarks: "For it was necessary, at first, that nature should be exhibited; then, after that, that which was mortal should be conquered and swallowed up by immortality, and the corruptible by incorruptibility, and man should be made in the image and according to the likeness of God".²⁴ Fr. Dumitru Stăniloae points out that purification is necessary in view of discarding passions, as they are but expressions of one's selfishness and of the limitations that it imposes on us.²⁵

With regard to the same question, it may be interesting to note that some occidental theologians have actually interpreted the body as a metaphorical expression of the limitations of a human being: "Outwardly it limits him in space and time; inwardly, it prevents him from expressing himself fully".²⁶ Yet, once passions have been discarded, the body will recover its natural state and humans will be free to develop fully – i.e. to develop body and soul upon even terms. From that point on we shall no longer talk about salvation *from* the flesh, but about salvation *of* the flesh: a transformation from impurity to the likeness of the resplendent body of Christ.²⁷

Fr. Dumitru Stăniloae also points out that human enhancement and the simultaneous purification of the human being are interdependent. However, he emphasises that they could not be reduced to a mere process of ethical improvement, psychological recovery, or physiological healing. Suspending the passions and discarding the limitations of one's selfishness allow the human to enjoy a spiritual awakening and an intensification of his

spiritual powers, formerly annihilated or limited by sin. Moreover, developing his inner powers will also enable the human being to cooperate with God, thanks to that extra amount of strength granted by God – so that by virtue of the irradiation of this surplus, the human dimension and the divine dimension would become closely intertwined and interconnected in a fecund manner.²⁸ As St. Hippolytus of Rome explained, “Thy body shall be immortal and incorruptible, as well as thy soul, for thou hast become God”²⁹ One can easily note the essential vision of the enhancement of the body, as necessarily following the purification of the soul, through the global complex process of deification.

Indeed, by succeeding to know God in Jesus Christ, human beings will know and experience what it really means to be fully human (since humans were created in the image of God). Such an insight will ultimately lead to the accomplishment of humanity's existential sense.

22.5. Enhancement, Koinonia and the Holy Eucharist

Therefore, human enhancement oversteps the limitations that are imposed by sticking to a set of ethical principles and practices. Even if they are presupposed and built-in, they will still be insufficient because they are a branch of the social or cultural conventions that govern them.³⁰ In order to achieve his existential design, humans have been called to participate in Divinity really and truly. Taking on this vocation is definitely conducive to his physical and spiritual transfiguration.

Revd. Fr. Dumitru Stăniloae explains that the transfiguration of the human body occurs in Christ's body when He is risen – hence, as far as humans are concerned, it should occur at his baptism; that is why receiving Him through the Holy Eucharist means receiving His deified body through the sanctifying work of the Holy Spirit. In other words, humans can receive the spiritual power of the Lord's body by receiving the Holy Sacraments.³¹

Having reached this point, it would be helpful to observe that in the Orthodox Church the dynamics of the Eucharist epitomizes the dynamics of human deification. The phrase, “Take, eat; this is my body”³² that is, “Take, eat; this is my body, which is broken for you: do this in remembrance of me”³³ indicates the sense of the matter's sacramental transformation into an area of encounter between humans and God. When our Saviour reveals Himself as being “the bread of life”³⁴ He highlights the fact that the act by which bread turns into His body, thus changing its nature, becomes a guarantee for the transformation essentially undergone by the bodies and souls of all those who will receive the Holy Eucharist. Along the same lines, the act of self-offering emphasised by St. Paul in I Corinthians 11:24 shows that the body, which is deified through the Holy Eucharist, becomes an opportunity for and a medium of humanity's enhancement: humans discover that they are ecclesiastical

and liturgical beings. Therefore, by receiving the body and blood of Christ, humans assume the Lord's Incarnation in a sacramental sense and partake of His divine nature. Thus the human body partakes of the theosis of the Lord's body – and by that his own body becomes a dwelling for God Himself and also “the temple of the Holy Ghost”.³⁵

At the same time, since the Eucharist is a religious act performed liturgically, the person who receives it becomes a member of the body of Christ, while the ecclesiastic congregation, the Church itself, becomes His metaphorical body.³⁶ “For we being many are one bread, and one body: for we are all partakers of that one bread” – St. Paul said.³⁷

The Holy Eucharist presupposes communion with God and with one's fellow human beings; receiving the Messianic sacrifice implies the offering of one's self to others and involves the association of the believer in a “bond of peace”³⁸ with all those who have received the Eucharist from the same chalice. Thus, the entire congregation of believers who have received the Holy Eucharist will become the mystical body of Jesus Christ. Accordingly, in Christian Orthodox liturgical theology the idea of human enhancement refers to the improvement of the human being both as a private person and as a communitarian or social individual open to the world. Insofar as humans have become “the temple of the Holy Ghost”,³⁹ they will learn to look at the world from an ecclesiastic perspective, i.e. as if looking at a space where one will actually get to know God and meet Him too.

The Eucharistic body, i.e. the ecclesiastic body,⁴⁰ crosses over the chasm that separates the Creator from His creation by means of an interweaving process, that is, by mixing the fire and water of the Eucharist and by a human participation in the divine life. Indeed, seen as an icon of the human *koinonia* with the Divinity, that is, of man's communion with God by an intimate participation in the divine life, the Divine Liturgy is the very key to human *theosis*.⁴¹

22.6. Sequitur...

In Christian Orthodox thinking, human enhancement relies on the “Medicine of Life” – the Christ of the Eucharist, rather than on specific material alterations of the body substance, in order to achieve fragmentary improvements of its appearance and functioning. As Fr. Dumitru Stăniloae affirms, human nature – assumed in Christ and elevated to happiness by its union with the divine nature – is the nature which God had granted humans from the start, which could have reached eternal bliss if they had obeyed the Creator and had done His divine will. Therefore, humanity's true nature has been restored and enriched in Christ. To crown it all, it is an eternal enrichment, because whoever has been united with Christ will become perfect in view of being united with the infinite divine transcendence, too; thus man will grow in perfection for ever.⁴²

Theosis – purification – offering – koinonia are keywords when it comes to looking at human enhancement from an Orthodox Christian perspective. The human body needs to be taken care of by virtue of being the image of God – not as a final reality and particularly not as a unique reality.⁴³ In this respect, human enhancement is revealed as an exercise in self-rediscovery, recovering the real significance of the body and changing the human being in its entirety.⁴⁴ Consequently, the body may capitalize on its capacity to mediate lucratively a changing relationship with the Divinity. The human being is enhanced when being in union with the divine transcendence, it lives unremittingly and unobstructed “after the likeness” of God (Genesis 1: 26-27).

¹ CEC, *Human enhancement. A discussion document*. Strasbourg 2010. http://csc.ceceurope.org/fileadmin/filer/csc/Ethics_Biotechnology/Human_Enhancement_March_10.pdf

² Marcel Mauss, *Sociologie et anthropologie*, Paris: PUF, 1985, p. 368.

³ According to the New Testament authors, the principle of communion resides in the attachment of the community to the mystical body of Jesus Christ. The result is a union experienced by each believer in their daily lives. The same conjunction that brings together the human being with Jesus Christ is also joining him or her with other believers. Among the writings of the New Testament, there are some very deep narratives describing those links as indeed vital and genuine in order to experience a spiritual level of intimacy among the members of a local church. Cf. Lawrence O. Richards, *Expository Dictionary of Bible Words*, Zondervan, (1985), 1991, pp. 275-276

⁴ Marius Lazurca (ed.), *Invenția trupului*, [f.a.], București: Anastasia, p. 99.

⁵ *Ibid.*, p. 97.

⁶ Isaiah 53:2-3; Philipians 2:5-11; Hebrews 2:10.

⁷ St. Irenaeus of Lyons, *Against Heresies*, V, 16, 1-2.

⁸ Michael J. Christensen, “Theosis and Sanctification: John Wesley’s Reformulation of a Patristic Doctrine,” in: *Wesleyan Theological Journal*, 31, 2, (1996), p. 72.

⁹ St. Irenaeus of Lyons, *Against Heresies*, V, Preface.

¹⁰ St. Athanasius, *On the Incarnation*, 54.

¹¹ St. Athanasius, *Against the Arians*, I, 39.

¹² *Ibid.*, III, 34.

¹³ Robert G. Stephanopoulos, “The Orthodox Doctrine of Theosis,” in: John Meyendorff and Joseph McLelland (eds.), *The New Man: An Orthodox and Reformed Dialogue*, New Brunswick: Standard Press, 1973, pp. 149ff.

¹⁴ Fr. Anthony, M Coniaris, *Achieving Your Potential in Christ, Theosis: Plain Talks on a Major Doctrine of Orthodoxy*, Light and Life Publishing Company, 1993.

¹⁵ St. Justin Martyr, *Dialogue with Trypho*, CXXIV.

¹⁶ II Corinthians 5:21.

¹⁷ Emil Bartoș, *Deification in Eastern Orthodox Theology: An Evaluation and Critique of The Theology of Dumitru Stăniloae*, Carlisle, Cumbria: Paternoster Press, 1999.

¹⁸ St. Athanasius, *Letter Concerning the Decrees of the Council of Nicaea*, 14.

¹⁹ Clement of Alexandria, *The Instructor*, III, 1.

²⁰ Clement of Alexandria, *The Stromata*, VII, 16.

²¹ St. Cyril of Alexandria, *In Ioannem*, 9.

²² Bishop Kallistos Ware, *The Orthodox Way*, St Vladimir’s Seminary Press, 1995, p. 168.

²³ John 1:14; 4:23-24.

²⁴ St. Irenaeus, *Against Heresies*, IV, 38.

²⁵ Pr. Dumitru Stăniloae, *Iisus Hristos și restaurarea omului*, Craiova: Ed. Omniscope, 1993, p. 187.

²⁶ Jörg Splett, "Body," in: Karl Rahner SJ (ed.), *Sacramental mundi. An Encyclopedia of Theology*, vol.I, London: Burns & Oates Ltd, 1968, p. 233.

²⁷ *Ibid.*, p. 234.

²⁸ Fr. Dumitru Stăniloae, *op.cit.*, pp. 188-9.

²⁹ St. Hippolytus of Rome, *On the Refutation of All Heresies*, X, 33-4.

³⁰ Cristina Bicchieri, *The Grammar of Society: The Nature and Dynamics of Social Norms*, New York: Cambridge University Press, 2006.

³¹ Fr. Dumitru Stăniloae, *Iisus Hristos, lumina lumii sau îndumnezeirea omului*, Anastasia, 1993, pp. 126-127, 131.

³² Matthew 26:26; Mark 14:22; Luke 22:19.

³³ I Corinthians 11:24.

³⁴ John 6:33-35.

³⁵ I Corinthians 1:24; 6:15, 19.

³⁶ I Corinthians 10:17.

³⁷ I Corinthians 12:27.

³⁸ Ephesians 4:3.

³⁹ I Corinthians 1:24; 6:15, 19.

⁴⁰ "For by one Spirit are we all baptized into one body, whether we be Jews or Gentiles, whether we be bond or free; and have been all made to drink into one Spirit" (I Corinthians 12:13).

⁴¹ Michael J. Christensen, *op. cit.*, pp. 83-4.

⁴² Fr. Dumitru Stăniloae, *op. cit.*, pp. 13-4, 148.

⁴³ *Ibid.*, p. 24.

⁴⁴ Marius Lazurca, *op. cit.*, pp. 117-8.

Chapter 23

REFLECTIONS ON ENHANCEMENT AND ENCHANTMENT A CONCLUDING ESSAY

by Theo A. Boer

REFLECTIONS ON ENHANCEMENT AND ENCHANTMENT A CONCLUDING ESSAY

by **Theo A. Boer**

Progress

Hardly any other generation has seen the amount of scientific and technological progress that we have seen in the past thirty years. Virtually everything humans use has been made better, safer, faster, more efficient, more sustainable, and more affordable – be it cars, screens, computers, communications, kitchens, airplanes, sunglasses, diagnostic devices, coffee brewers, building constructions... Among the exceptions are things we expect to remain as they were, ranging from Cuban cigars, Coca Cola Classic, and Grandma's apple pie recipe to nonmaterial goods such as literature, art, antiques and liturgy. For most other goods, especially consumer goods, characterizations such as, 'new formula!' and 'energy efficient!' encourage us to buy new generations of products, even if many of these claims are excessive, and even if the old products still work.

Mundus vult decipi, ergo decipiatur – the world wants to be deceived, so let her be deceived. Our generation has grown up in a world in which the continuous improvement of virtually everything we use is a law of nature. Janne Nikkinen explores this vocabulary of progress in his contribution to this volume. It seems that a scenario of setbacks or even regress, and the thought that progress will one day come to its limits, is as intolerable to us as we think it is unrealistic. In the midst of the undeniable, unprecedented, and blissful technological progresses made, there also is a lot of deceit and self-deceit – witting or unwitting. One of the reasons for unfounded expectations is a tendency to base our predictions on observations from a fairly recent past. In the late 1990s, before the burst of the Dot-com bubble, a combination of rapidly increasing stock prices, market confidence that the companies would generate future profits, individual speculation in stocks, and widely available venture capital, created an environment in which many investors were willing to overlook traditional metrics in favor of sheer unlimited confidence in the advances of ICT-technology. Individual investors were so convinced that this process would continue that they financed high-risk investments with borrowed money. When the bubble burst, numerous investors lost the greater part of their investments. We have witnessed similar hypes in banking, on the housing market, and in national economies.

Clearly, the mandatory warning made to would-be investors – “past performance does not guarantee future results” – is more than a phrase. It addresses the persistent human

propensity to base conclusions about the likelihood of future success on short term evidence, selective statistics, and wishful thinking. In the real world, there are bound to be technical setbacks, more serious side-effects than anticipated, funding difficulties, fading public support and, last but not least: we may simply not be lucky enough to register the expected technological successes. The term 'human enhancement' implies the suggestion that a world full of opportunities for human flourishing is waiting 'out there,' if only we are patient and cooperative enough. Interestingly, as Boer and Dekker observe, the notion of 'enhancement' seems to occur more frequently in debates about science and technology than it does in publications stemming from science and technology.

Definition

We need to discuss human enhancement issues in the most balanced way possible, and this is what the 25 authors in this volume have in mind. But a persistent problem in any discussion about human enhancement is the absence of unanimity about the concept and its content. An extra complexity is that any definition includes implicit or explicit evaluative notions which give the term a double function: a referential function (describing facts) and a prescriptive one. More 'neutral' terms used for some of the same technologies, such as 'genetic modification' and 'converging technologies' do not have this disadvantage. Donald Bruce, as in an earlier document issued by CEC, describes human enhancement in terms of "an aspiration to use technology, to make functional changes to human characteristics, abilities, emotions and capacities, beyond our current physical limitations." Another definition describes human enhancement as "the use of biomedical technology to achieve goals other than the treatment or prevention of disease," and a third as "any attempt to temporarily or permanently overcome the current limitations of the human body through natural or artificial means." In the latter definition, there is no reference to using technology only (enhancement can also take place by using 'natural' means), nor is there a prerequisite that the changes should be permanent.

Clearly, then, umbrella definitions that are so broad that they can refer to any successful attempt to overcome human limitations – even sunglasses or thermal underwear – are of little use. The definitions used by the CEC document and by Donald Bruce are both more restrictive, more usable, and more thought provoking than some more general alternatives. By including concepts like 'normal' or 'natural,' the normative meaning that is already implicit in the term 'enhancement' is further strengthened. One may criticize this normative approach – as Peter Dabrock does, for example: by this definition a number of implicit and debatable normative assumptions may be smuggled in. However, as Christopher Coenen and Ruud ter Meulen argue, we need a definition that can be used for policy purposes and this may imply the use of normative notions and choices. Ter Meulen refers to the utilitarian philosopher John Harris who argues that the only thing that matters is the consequences of human enhancement for wellbeing. Ter Meulen

concludes that such a vague focus on the beneficial effects blurs the distinction between therapy and enhancement and makes it difficult to develop any policies regarding human enhancement. From a European perspective, developing guidelines is very important, as also Doris Wolfslehner advocates in her chapter. Hence, it seems that we cannot do without the undeniably problematic distinction between technologies that seek to restore 'normal' functioning and others that seek to change our definition of 'normalcy.'

What is New about 'Human Enhancement'?

One of the key obstacles to finding an acceptable definition lies in the term 'enhancement' itself. What is it supposed to convey compared to alternative terms? Is the term 'enhancement' equally pejorative as, for example, the term 'heaven'? Or does, on the contrary, the term function as a warning signal, carrying a negative connotation similar to a term such as 'doping'? The latter seems doubtful: hardly anyone would argue that improving the conditions for human wellbeing is problematic or wrong in itself. Improving things for the benefit of humanity is what humans have been doing for ages! If the term 'human enhancement' is just a new term for an old tradition, there are no novel ethical issues. Neither is it a novelty that new technology brings new side-effects, risks, costs, and distributive concerns. These just have to be dealt with responsibly. So, again: what is new?

Probably the striking feature in this case is the combination of the term 'enhancement' with the adjective 'human.' It may or may not be intentional, but the adjective 'human' can refer both to humans as subjects and as objects of enhancement. The suggestion is thus that for the first time in history humans will not only be the subjects but also the objects of technological interventions – humans making better humans. Not only will things around us be improved, but our very selves will be made better.

All kinds of questions arise. It is as if the term has been deliberately chosen for the purpose of causing debate. Do we as humans have the powers to take our destiny into our own hands? And if so, who is setting the standards for goodness? As Donald Bruce observes, "the proposal of human enhancement is meaningless without some concept of normalcy as a base from which enhancements are supposed to 'improve.'" Most religious people assume that the ultimate measure for goodness is not made by humans, but rather discovered by them. Whether this knowledge is accessed through natural means – reason, convention, nature, intuition – or special revelation – the Bible, the religious community, prayer – is not the most important question here. The crucial question is whether or not the standards of goodness are set by the humans that are engaged in the enhancing. Within a realistic theology, i.e. a theology that assumes the existence of a God independent from human constructions and imaginations, the ultimate gauge of goodness comes from God. Hence, any redefinition of standards of goodness, especially human goodness, should also in some form originate from God: God the creator, God the sustainer, God the redeemer.

Theosis

In this volume, the most direct link between human enhancement and Divine creation (and re-creation) is found in the contributions from Orthodox communities. Real enhancement, it is argued, should be understood in a theological and ontological way. Humans are called back to the union of divine and human that was intended in the creation and destroyed by human sin. His Eminence Metropolitan Emmanuel of France, for example, stresses that in Orthodox thinking the Garden in Eden is understood as the inner space of the human being, in whose heart stand the tree of knowledge and the tree of life. The two trees are distinct but not separated. In the tree of life – the symbol of *God's desire* for the human being – the sap goes down from God to the human being; in the tree of knowledge – symbolizing the *human desire* for God – it goes up from the human being to God. The accomplishment of the human being is the fruit of the encounter of these two desires.

In the Orthodox contribution of the Romanian scholars Stefan-Ioan Stratul and Constantin Jinga, there is an impressive closeness between 'enhancement' and the theological conception of *theosis*. Theosis refers to the human potential to reach perfection. The concept was anticipated in ancient Greece and was further developed by Christian writers in the sense of a unification of Creator and creation. True human enhancement, in other words, takes place when the divide between humans and God that is the consequence of sin has been bridged. From this same starting point, the Greek Orthodox neuroscientist Stavros J. Baloyannis welcomes the achievements of research and technology, as long as they are "beneficial for the physical, mental and spiritual harmony of the human being for the glory of God and the sanctification of the life."

Knowing Ourselves – and God

Also other contributions make attempts to link the human quest for scientific and technological progress to God who is the source of all our values. According to Donald Bruce, the Christian context that human life is lived primarily in relationship to God and to others sets up a distinction between enhancement for our own independent exaltation, and our enhancement under God for the glory of God. Ulrich Körtner argues along the same lines when he extends the well-known saying above the entrance to the oracle of Delphi, '*gnothi seauton* – know yourself!' to 'knowing yourself – before God.' "The question," according to Körtner, "is not whether or not we should totally reject human enhancement, but the question is which forms of conduct accord with the confession of creatureliness in the image of God, and which forms of conduct contradict such a confession." According to Körtner, "interventions in the natural state of the human body can be in accordance with, as well as contradict a confession of faith in God." In line with his Protestant tradition, he advocates a new approach to the creatureliness and image-of-God in human beings. "This new approach is opened up, not by a resacralization of nature, but by a justification-oriented theological reconstruction of the doctrine of creation: the

right to imperfection. Christian anthropology does not measure the person according to a generalized idea of the human and its ideal form. Rather it measures on the model of the suffering and crucified Christ, who ‘had no form...that we should desire him.’ The old human being, in the biblical view, is not in need of improvement but of forgiveness. Boer and Dekker follow along the same lines. They refer to a dialogue between *Brave New World* administrator Mustafa Mond and the ‘Savage,’ one of the few remaining non-enhanced humans left on the planet. Contrary to Mond’s contention that humans should be happy, the Savage claims the right to be unhappy and imperfect.

Bridging the Gap

From a Protestant perspective, Brendan McCarthy formats the debate on human enhancement in terms of solving tensions. He argues that many tensions in the field of new technology can be described in both ‘secular’ and ‘theological’ language. For example, the broadly felt tension between ‘nature’ and ‘human intervention’ finds a theological expression in the tension between ‘stewardship’ and ‘co-creation.’ Likewise, the tension between pessimism and optimism is, theologically interpreted, a tension between ‘Fall’ and ‘Creation.’ McCarthy concedes that, by choosing this vocabulary, Protestant Churches can be criticised for presenting a fractured witness to society. However, this may make Protestant churches well placed to draw alongside our diverse societies in their quest better to understand and to apply techniques and technology associated with human enhancement. Other contributors, like Schardien, Schmidt, and Dabrock make the same claim: churches must be able to engage in public theology.

Perhaps surprisingly, most authors in this volume are not opposed to human enhancement *per se*. The debate, which has been dominated very much by the dichotomy between transhumanists and ‘doomsday prophets,’ is more nuanced in this volume. This may, in part, be due to the diffuse character of the term, ‘human enhancement.’ It may also have to do with the fact that one can hardly be categorically opposed to improvements. Many contributors explicitly affirm the human responsibility to develop technology and science. Rabbi Guigui, for example, says that in the Jewish tradition science is the expression of a duty, the duty to know, which stretches the physical world into the metaphysical world. According to the Islamic scholar Omar van den Broeck there is “no compartmentalization between sciences; no division between sciences and their applications; no division between ethics and science; and no division between ethics and religion. The highest goal is not happiness but to serve God.” He and many others deliberately leave open which forms of human enhancement can be justified and which not.

Factual Effects of Enhancement

Pivotal in many discussions on human enhancement is assessing and weighing the different effects. We may for this purpose distinguish between two sorts of effects. First, there are

the factual effects of technological innovations on the lives of humans. We can describe them in terms of the intended positive effects for human functioning, life expectancy, health, and wellbeing. In the contribution of Boer and Dekker, the Delft nanoscience professor Cees Dekker reports some astonishing achievements in the field of brain-machine interfaces. There are also the unintended positive side-effects: Springer-Kremser, Ter Meulen, and Körtner refer to the so-called off-label uses of medicines: medication which enhances the lives of patients in a way that was not anticipated originally. Henriette Krug discusses deep brain stimulation in the case of Parkinson's disease. She reports that some of the patients that were treated were gladly surprised by the positive side effects that were not originally expected, and found their moods and emotional lives 'enhanced'.

Perhaps typical for any moral discussion on something new is the interest in the potential negative side-effects. This volume is no exception. Even those who are predominantly positive about human enhancement do not ignore the possibility of serious and irreversible side-effects. Some authors are especially cautious. The Serbian Orthodox bishop Perovic, for example, calls the planned destruction of human embryos a 'monstrous act.' Rabbi Albert Guigui expresses a deep fear that as a consequence of the instrumentalization of human life, we may in some future once again see the planned destruction of groups of people. Anestis Keselopoulos, in his contribution about plastic surgery, accentuates the concerns of safety and risks of this procedure. He points to frequent side-effects and infections of plastic surgery, which in some instances have even led to death. Rabbi Albert Guigui interprets these adverse side-effects as 'nature taking revenge.' Many contributors also express the fear that human enhancement is inevitably fraught with societal inequalities. Ulla Schmidt, for example, explores the question that enhancing technologies or substances are what some call 'positional goods,' being valuable only to the individuals who pursue or attain them. Moreover, they obtain their value to the extent to which they are shared only by a limited number of people. In fact, this is a major concern: what if the new technologies that many of us help to fund and promote so enthusiastically, end up leaving us with a competitive and oppressive Hobbesian society? And, to follow a suggestion of Keselopoulos, what if human enhancement technologies are simply too costly to justify in a world in which there is so much poverty?

To describe all these positive and negative effects, Doris Wolfslehner and Stefanie Schardien suggest the use of the four principles developed by Tom L. Beauchamp and James F. Childress. Wolfslehner calls these principles 'markers of human rights': respect for autonomy, care for wellbeing and integrity, caution with respect for damage done and risks taken, and a concern for the equal distribution of benefits and burdens. Clearly, a lot can be said about these effects. In this concluding reflection, we will be concise. All contributions in this volume focus in one way or another on the different effects.

Effects on our Self-Understanding

Secondly, there are the effects that human enhancement may have on our self-perception as humans. If we become able to drastically improve not only our living conditions but also the quality of our genome, this will probably boost our self-confidence as humans. Humans may come to consider themselves (or their political and academic leaders) as the guardians of the human species. Interestingly, this effect can occur even when technologies themselves do not have the expected results: the mere focus on the development of human enhancement technologies may foster a cultural optimism. With or without good reasons, technology and the pursuit of human enhancement can lead to *hubris*, pride. In different ways, several authors refer to the Biblical narrative of Babel in which citizens of a highly developed and highly ambitious culture make a desperate attempt to reach up to the skies.

Are we ignoring the Real Problems?

A number of authors are not so critical about human enhancement in itself, or its dangers and pitfalls, as they are about the discussions accompanying it. First, there is the question whether the entire debate about human enhancement may not be a 'non-discussion,' the result of an occasional liaison of transhumanists and doomsday prophets. The former welcome the dawn of a new human species; the latter lament the demise of true humanity. Interestingly, thus, the antagonists agree that human enhancement will be able to put humans on the threshold of a new era. Peter Dabrock and others speak about an unhealthy preoccupation of churches with questions of enhancement, taking too seriously the transhumanists and their unrealistic expectations. More nuanced voices in the middle are at risk of being pulverized between the extremes.

Another objection about the way discussions about enhancement take place is that our attention is diverted from other, much more pressing moral issues. Donald Bruce, for example, asks: "[W]hat is the real point of human enhancement, when we are faced with the combination of climate change, water and soil loss, food insecurity, disease, poverty, and a growing disparity in human wealth and health between haves and have-nots? In an already divided and unjust world, social injustice is perhaps the biggest single ethical and theological objection to enhancement technologies." Peter Dabrock makes a similar point when he argues that the real question behind the enhancement debate may stem from our incapacity to deal socially with performance requirements in modern society: "I tend to believe that there is not primarily a spiritual or ideological issue behind the enhancement question. Rather this whole debate is a surface manifestation of a deep social crisis. The churches, at least those that take seriously the biblical message of God's faithfulness to the people and its preference for the disadvantaged, should turn away from the sideshow and turn towards the serious social problems." From a European Union perspective, Ruud ter Meulen sustains this point by arguing that the fight against discrimination and for the

inclusion of people with disabilities is an important goal of the European Union and should be part of policy-making with regard to human enhancement. We need to get away from the limited perspective of safety, risks and precaution, and should include issues such as justice, solidarity with marginalized groups, prevention of exclusion, and protection of privacy.

There may be other neglected concerns in the enhancement debate. The psychoanalyst Marianne Springer-Kremser suggests that the use of enhancing drugs may well prove to be a fake solution for the real problem. According to her, the call for enhancement is sometimes a cry for help and some psychiatric illnesses may have to be treated not with drugs but with psychotherapy. Janne Nikkinen points to the fact that alcohol is the third leading factor in disease and mortality in Europe, after tobacco and high blood pressure. For these top three health problems, argues Nikkinen, nano-biotechnology or human enhancement may have little or nothing to contribute to treatment and prevention.

Enhancement and Survival

Are discussions on human enhancement a sideshow? We do indeed need to take into consideration the economic, monetary, and societal developments since 2007, and their far-reaching effects on political discussions. The ongoing economic crisis in Western economies, which erupted fully in the autumn of 2008 and is raging as we write, is a compelling reason to focus our attention on more urgent concerns than speculating on technologies that may make humans better. For many people in affluent societies, the question is not 'how to make life better.' It is how to survive in a dignified way. Unemployment has reached staggering dimensions in some countries, cuts are being made in pensions and social security payments, the post-war baby boomers are gradually leaving the labor market and entering the 'market' of institutionalized care. *Zuerst das Fressen, dann die Moral* – "food is the first thing, morals follow on" – is a famous saying of Bertold Brecht. In our context it should perhaps read, "food is the first thing, enhancement follows on."

'Human Enhancement' – Goodbye to a Term?

A further interesting point raised in this volume is the switch described and advocated by Rinie van Est and Mirjam Schuijff from a focus on enhancement within the body to technologies outside the body. Reading between the lines of their analysis and those of others in this volume, we can observe a growing awareness that genetic enhancement may not be within reach in the foreseeable future. Perhaps the highest attainable results to be expected are the fruits of an increasing interaction between technology and biology. In that case, however, it is doubtful whether we can speak of enhanced humans at all. Using cochlear implants in the twenty-first century does not make better humans any more than using glasses did in the centuries before. True and lasting enhancement, it seems, would

be achieved if scientists succeeded not only in helping humans to perform better, but also managed to anchor this ability in the human genome by using germ line modifications. Only thus would there be a chance that improvements would be part of the genetic constitution of future generations of humans.

The manifold and promising technological developments in the past two decades have set the stage for fierce hopes and grand expectations. Those who have watched this play for the past ten to fifteen years may conclude that it was more a play of human enchantment than of human enhancement. Perhaps we should abandon the vocabulary of 'human enhancement' altogether. There are more sober and less overwrought alternatives. If the term were to fall into abeyance in the near future, this would be for a number of reasons: there is no consensus about its content; it raises fears and hopes beyond what can be scientifically substantiated; it raises theological questions connected to concepts such as 'sin,' 'image of God,' and 'playing God'; and it raises philosophical questions connected to concepts such as 'goodness,' 'nature,' and 'normalcy.' Let scientists in the meantime continue to develop converging technologies for improving our performances and our living conditions. There are many technological and societal problems to solve, and there are urgent theological and moral reasons to do so.

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Dr. Theo A. Boer (1960) is associate professor of Ethics at the Protestant Theological University in Groningen, the Netherlands. He is a member of diverse medical ethics committees and is frequently heard and seen in the Dutch media. He published extensively on bioethical issues from a Christian perspective, especially about the status of the human embryo and questions with regard to euthanasia and assisted suicide. Since 2012, Dr. Boer chairs the Working Group on Bioethics of the Conference of European Churches.

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Dr. Omar van den Broeck represented the Muslim point of view at the Conference. He is the General Secretary of the Belgian Muslim Executive. He has published various articles in French and Dutch on Islam.

Dr. Donald Bruce holds doctorates in chemistry and in theology. After 15 years in nuclear energy research and risk regulation, he became Director of the Church of Scotland's Society, Religion and Technology Project (SRT) (1992-2007), and now manages the independent consultancy Edinethics Ltd. He has done pioneering ethical assessment of many emerging technologies including GM crops, cloning, stem cells, nanotechnologies and human enhancement. He has been a member of many technology advisory bodies, of the bioethics working group of the Conference of European Churches 1993-2009 and was rapporteur for its discussion paper on human enhancement.

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ACKNOWLEDGEMENTS

Our gratitude goes to:

- The authors of the chapters, as well as to the members of their staffs who provided help in the process of editing and correction.
- Ms Diane and Revd. John Murray and Ms Véronique Dessart for the English and general proofreading. They provided invaluable assistance in editing this book. For any remaining stylistic and grammatical errors the editors take the full responsibility.
- Ms Maria Pomazkova at the CEC Secretariat for her remarkable commitment to the coordination of the editing process.
- The other members of the Working Group on Bioethics and Biotechnology of the Church and Society of CEC:
 - Prof. Dr. Stavros Baloyannis
 - Dr. Andrea Dörries
 - Prof. Dr. Ulrich Körtner
 - Revd. Dr. Karsten Lehmkuhler
 - Revd. Dr. Brendan McCarthy
 - Ms Miriam Szurman

The Church and Society Commission of the Conference of European Churches Invites
a broader discussion on human rights and offers training on human rights.



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