

The triangle of new and emerging technologies, disabled people and the World Council of Churches; Able-ism: A prerequisite for transhumanism¹
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Purpose of this ebook

The purpose of this ebook is to function as a starting point of discussion of four seemingly different but as this e-book will show interrelated topics a) the relationship between disabled people and the WCC b) the reaction of the WCC towards advances in science and technology c) the relationship

between new and emerging technologies and disabled people and d) the impact of new and emerging technologies onto the WCC. The e-book was written with the explicit intend to break down the artificial and untenable walls between these four different areas, to diminish the 'silo thinking' so prevalent in today's discourses and to show how the four topics influence each other.

After finishing this e-book, the reader will better understand how the different issues are interrelated. The author also hopes that the reader realizes that what is done to the most marginalized is in the end done to everyone and that it might be very prudent to follow Matthew 25: 40 "whatever you did for one of the least of these brothers of mine, you did for me" (New International edition). We should all evaluate and investigate new and emerging technologies from the bottom up of the most marginalized and take into account seriously the We-You critique of the WCC voiced by EDAN (Ecumenical Disability Advocates Network) at the 9th General Assembly The We-You changes markedly with the advances in new and emerging technologies as this e-book shows. The e-book also shows intrinsic biases especially towards how disabled people are perceived in the WCC discourse around new and emerging technologies and the consequences flowing from them. Last, but not least, the author hopes that the e-book shows the disruptive potential of the new and emerging technologies for the different members of the WCC, the WCC as an organization and the reconciliation process between the WCC and other faith and churches as the new and emerging technologies will affect different faiths and different churches in different ways. Different products made possible by the new technologies will challenge beliefs and challenge doctrinal foundations of different faiths, religions and churches in different ways.

This book is another step in a journey

A booklet on converging technologies(1) was distributed at the 9th General Assembly as a initial discussion primer for converging technologies which was again a result of a Bossey seminar on new and emerging technologies. The ecumenical conversation and the mutirão were another step after the publishing of the booklet. The e-book can be seen as another step of deepening the discourse in converging technologies.

This e-book focuses on policies of the WCC and policies of churches that are members of the WCC. It also addresses policies of national council of churches, which while not members of the WCC, work closely with the WCC. The author lacks qualifications to make any in depth judgments on how other faiths, religions and theological discourses are impacted by the advances in science and technology and the accompanying public discourse. However, every faith, religion, theology and church related policies will be effected by developments in science and technology and the public discourse and societal changes around them . Still, different faith, religions/theologies and church policies will be effected in different ways as they have different foundations on which they base their actions and different historical responses to earlier developments in science and technology. The greater the differences in a faith group's response to these new technological developments the more strained the relationship between different faiths, religions/theologies and churches might become and an ecumenical and interfaith relationship may be especially impacted by these converging technologies and the public discourse and societal developments around them.

Introduction:

"I believe in transhumanism': once there are enough people who can truly say that, the human species will be on the threshold of a new kind of existence, as different from ours as ours is from that of Peking man. It will at last be consciously fulfilling its real destiny."

Julian Huxley First Director-General of UNESCO(2)

Nanotechnology, the art of manipulating materials on an atomic or molecular scale⁽³⁾ enables a new paradigm of science and technology which sees different technologies converging at the nanoscale namely (a) nanoscience and nanotechnology; (b) biotechnology and biomedicine; (c) information technology, (d) cognitive science and e) synthetic biology which is described on the synthetic biology community webpage to mean: (a) the design and construction of new biological parts, devices, and systems; and (b) the re-design of existing, natural biological systems for useful purposes ⁽⁴⁾ ("NBICS" (nano-bio-info-cogno-synbio). We will also see increasingly a reaction of other fields of sciences such as social sciences, religion, medicine, economics, health technology assessment, health research, anthropology, environmental sciences, disability studies/variability/ability studies towards NBICS products and ideas for research and development.

"What do we want from NBICS? What do disabled people, the WCC, other denominations and faiths, secular groups, societies at large and high, middle or low income countries want from NBICS? How do advances in NBICS change and influence our self perception, our self identity, the quality of our lives and our ability to pursue 'the good life' and our perception of what entails 'a good life'? Science and technology research and development and usage follows social norms, expectations and markets and changes and influences the quality of our lives, our perception as to what is a 'good life' and our ability to pursue 'the good life'.

How do future possible NBICS products change and influence disabled people, members of the WCC, other denominations and faiths, secular groups, societies at large and high, middle and low income countries?

Answering these questions requires an examination of the complex interdependent fabric of perceptions, values, and choices within different cultural, economic, ethical, spiritual, religious and moral frameworks.

Numerous lists of anticipated NBICS products exist ^(5;6). Applications and products are envisioned in areas such as the environment, energy, water, military applications, globalization, agriculture, and health (e.g., more efficient diagnostics and genetic testing, cognitive enhancement; life extension, and enhancing human performance in general) ⁽⁷⁾. The social group of transhumanists ⁽⁸⁾ hopes for extreme life extension to the level of "immortality", and morphological ⁽⁹⁾, and genomic freedom ⁽¹⁰⁾..

A recent survey ⁽¹¹⁾ concluded that the top 10 nanotechnology applications for development are:

- Energy storage, production and conversion;
- Agricultural productivity enhancement;
- Water treatment and remediation;
- Disease diagnosis and screening;
- Drug delivery systems;
- Food processing and storage;
- Air pollution and remediation;
- Construction;
- Health monitoring;
- Vector and pest detection and control.

The UN Millennium Project's Task Force on Science, Technology and Innovation identifies nanotechnology as an important tool for addressing poverty and achieving the Millennium Development Goals. ⁽¹²⁾

NBICS usage, research and development are human activities often articulated in terms of better and/or more sustainable health care, better health, more wellness, more efficient health systems and health care delivery in particular, as an answer for global problems of disease and ill medical health.

Indeed medicine is, in most developed countries, the largest or second largest nanotechnology application. A variety of NBICS medicine taxonomies (13; 14) and NBICS medicine roadmaps exist (15) (16) (17) and numerous applications are envisioned, in development, or already in use (15-18)

However intentions, purposes and actions which shape direction, advances and policies of health-focused science and technology usage, research and development in particular embody the perspectives, purposes, prejudice, particular objectives and cultural, economical, ethical, moral, spiritual and political frameworks of different social groups and society at large of any given society in which these human activities take place.

So-called disabled people are often highlighted as the beneficiaries of NBICS-medicine products. NBICS 'health' products are promoted as tools for fixing disabilities -whereby disability is used as a synonym for impairments, diseases, defects, and 'subnormal species typical' abilities- focus mostly on offering disabled people medical solutions (prevention or cure/normative adaptation) and might move towards transhumanist/enhancement solutions (augmentation, enhancement of the human body), but rarely offers social solutions (adaptation of the environment, acceptance, societal cures of equal rights and respect).

However, the visions of NBICS comes with consequences such as the appearance of a new class of marginalized people the **techno poor disabled**(19) and significant questions remain about NBICS – how much of the vision will become reality; who will have access to the products; are they safe; how do certain product impact on the 'social contract' between humans; and what impact will NBICS have on the lives of the poor and marginalized?

This reality makes it important for the WCC to engage in a proactive visionary way in the discourse of NBICS for which this e-book is a contribution.

Key findings and Suggestions

With recent and to come scientific advances and the discourse around them one can predict the following:

- Moving from Species-typical functioning to Beyond species-typical functioning
- Moving towards the generation of new social groups (techno poor disabled) and towards more ability divides
- Moving from nature based commodities (i.e. cooper, rubber) towards nanoformulated commodities towards atomic commodities (molecular manufacturing)
- Moving from dissecting life towards building life base-pair by base-pair
- Moving from curative to enhancement medicine?
- Moving from human rights to sentience rights?
- Moving from ableism towards transhumanization of ableism
- Moving towards the transhumanization of a variety of religious, theological and faith based concepts
- Impact on the reconciliation process
- Impact on nearly every aspects of the World Council of Churches and its work from Trade (molecular manufacturing), human security (water, climate, energy, food...), health and healing, justice (ability divide), weapons to peace, poverty reduction and social cohesion.

Some suggestions as to what to do are towards the end of the e-book but the author hopes that this e-book leads to a discussion from which many suggestions will be generated.

Setting the stage I: The History

The situation of disabled people in the WCC:

Since 1971, the WCC(20) has considered disability an important concern of the church recognizing that church unity cannot be achieved without the participation of persons with disabilities. The Fifth Assembly of the WCC (1975) in Nairobi, Kenya reaffirmed this sentiment and in 1977, a staff task force on Persons with Disabilities was established. At the WCC's Sixth Assembly (1983) in Vancouver, Canada, 21 people with disabilities were present. In 1997, an interim statement on the "Theological and Sociological Understanding of the Issue of Disabilities" was prepared by a working group and brought to the WCC Central Committee for adoption. With a new title of "Interim Statement on the Theological and Empirical Understanding of the Issue of Disabilities", it was sent to member churches, regional ecumenical organizations and national councils of churches. In his enclosed letter, the WCC general secretary said, "[The document] presents what may be a new perspective for many churches: that congregations need the presence of people with disabilities.' The parts of the body which seem to be weaker are indispensable.' (1 Corinthians 12:22)". The program on Persons with Disabilities was discontinued in 1996 due to lack of money. The stream coordinator and the Disabilities task force worked hard to get the participation of Persons with disabilities as advisers at the WCC's 8th Assembly in Harare, and to establish a network (Ecumenical Disability Advocates Network, (EDAN Network)(21). The working group recommended placing a disabled person on the Assembly Planning Committee to represent the concerns of the Differently Abled. Consultations with Differently Abled Persons were held over time(20) with the purpose to mainstream disabled people into every aspect of WCC. The latest consultation produced the interim statement "A Church of All and for All" which was presented by EDAN to the World Council of Churches CENTRAL COMMITTEE. (22)

This interim statement received many positive reactions. The general secretary of the World Council of Churches, Konrad Raiser, said: " Churches must develop a new culture of caring and affirming life that includes people considered by others to be disabled"(23). Raiser told the WCC central committee that the experience of people with disabilities raises critical questions about some modern interpretations of the Christian affirmation that humanity is created in the image of God and that such interpretations have "exacerbated the prejudice that we should all be 'perfect' since we are made in God's image." That kind of view reinforces the thinking that human beings who are imperfect should be killed via abortion or weeded out through new technologies such as genetic screening of embryos or cloning. Commending the work of the Ecumenical Disabilities Advocates Network (EDAN) and its document, "A Church of All and for All", Raiser said that "its theological reflections also have a direct bearing on the ethical challenges arising in the field of bio-technology"(24).

The Ninth General Assembly of the WCC and disabled people:

The ninth general assembly of the WCC in Brazil showed two faces in regards to disabled people. On the one hand, disabled people were present in the worship part by reading the scriptures, playing music, carrying the signs. The resources for prayer and praise mentioned disabled people

We pray for liberation from stigmatizing attitudes towards disabled and ill people. (p.84)(25)

In addition, numerous other wordings in the liturgies used could be interpreted as asking for actions that would improve the situation of disabled people and other marginalized groups.

p.80 a) give justice to the weak and the orphan; maintain the right of the lowly and the destitute. Rescue the weak and the needy; deliver them from the hand of the wicked

p.81 Happy are those...who execute justice for the oppressed

p.83 We pray for all those imprisoned by grinding poverty; Hear our prayers for all who yearn for liberation from unjust systems and oppressive regimes

p.84 In a world in bondage we pray for.... Those who break the chains of injustice and bear witness...

p.87 that we may celebrate diversity while valuing wholeness

p.88 that we may desire justice with all our being

p.93 forgive our sins of not recognizing your holy image in others
p.108 May God bless you with anger at injustice, oppression and exploitation of people so that you will work for justice, equality and peace.
p.108 And may God bless you with the foolishness to think that you can make a difference in the world, so that you will do things which others tell you cannot be done
p.127 Our God heal us from exploitative social structures that condemns many to poverty...
p.127 Heal us from poverty
p.127 Heal us from international injustice
p.127 Heal us from social stigma and discrimination

In the moderators' report one reads:

" p.17c) It means becoming a community of and for all; where all segments of society come together within the framework of a common life and decision-making, where the voices of women are heard, the participation of youth is encouraged, and expectations of differently-abled people are met; where, in fact, all forms of discrimination are destroyed."³

The general secretary report does not mention disabled people. One could perceive p.30 to include them and to demand certain action

p.30 We must struggle to hold up the voices of the poor, to recognize them as actors in their own struggles, and to continually strive to enable them to advocate on their own behalf, to tell their own stories in their own language⁴

On the other hand, disabled people were severely underrepresented as plenary speakers and delegates and most policy documents did not mention disabled people .

One presentation reflected actions to respond to the calls of the most vulnerable, but did not go on to mention that disabled people are often the most vulnerable of the "most vulnerable".

"Shortly after my arrival at the ILO, Konrad RAISER and I very quickly understood that we were pursuing the same objective: how could we, together, respond more effectively to the calls of the poorest and most vulnerable in the world? Plenary on economic justice"⁵

It was also telling that of the public issue documents

Latin America
Responsibility to protect
UN reform
Terrorism
Water for life
Nuclear arms
People of other faiths

none covered the concerns of disabled people.

Only through interventions at the assembly could language useful to disabled people be added to the documents.

³ Report of the moderator Document No. A1 <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/plenary-presentations/moderators-and-general-secretarys-report/report-of-the-moderator.html>

⁴ . <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/plenary-presentations/moderators-and-general-secretarys-report/general-secretarys-report.html>

⁵ Juan Sovavia Message from the ILO director-general on the occasion of the World Council of Churches Assembly <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/plenary-presentations/economic-justice-a-world-without-poverty-is-possible/dominique-peccoud-presentation.html>

Water for life

6. It is essential for churches and Christian agencies to work together and to seek co-operation with other partners, including other faith traditions and NGOs, and particularly those organizations that work with vulnerable and marginalized populations who hold similar ethical convictions.

Proposals

That the 9th Assembly of the World Council of Churches meeting in Porto Alegre, Brasil 14-23 February 2006: f) urge governments and international aid agencies to give priority to and allocate adequate funds and other resources for programmes designed to provide access to and make water available to local communities and also promote development of proper sanitation systems and projects, taking into account the needs of people with disabilities to have access to this clean water and sanitation service⁶

Statement on Latin America

4. Since the wars of independence, many political leaders have called for the unity of the different Latin American states and in the last two hundred years many attempts to develop a Latin American unity have been made. Today, in the framework of the global political trends, which support regional integration, such unity is vital. Churches in the region have clearly stated that current efforts to build bridges between states should be based not only on economic trade agreements but should also respond to the needs and rights of the people, especially the weak and vulnerable.

Proposals

That the 9th Assembly of the World Council of Churches meeting in Porto Alegre, Brazil 14-23 February 2006:

b) Commends the Latin American churches in their work to overcome poverty and injustice, heal the wounds of violence, struggle for life and dignity, grant equal treatment to all religions in national legislations and asks them to further develop their work and reflection on issues such as grace, economy, gender, youth, disability, ethnicity, ecology and violence as part of their contribution to the ecumenical movement and in preparation for CLAI's Assembly in 2007⁷.

A whole statement is on 2. Vulnerable populations at risk. ⁸

However, it is very unclear whether disabled people are covered under the nebulous term "vulnerable."

The only policy document which mentioned disabled people (using the term differently able) from the start was the one on UN reforms

e 8. One significant achievement of the summit was the acknowledgement that the realisation of peace/security, development/social and economic justice and the implementation of human rights are inseparably linked. This should serve as the fundamental framework and policy orientation for the continuing process of reform. In fact, for people on the ground it has always been obvious that there can be no security in a situation of utter deprivation; that economic development at the expense of the recognition of human rights, in particular the rights of the marginalized, women, children, indigenous and differently-abled people does not serve the cause of social justice; and

⁶ ; <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/plenary-presentations/committee-reports/public-issues-committee/water-for-life-statement.html>

⁷ <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/plenary-presentations/committee-reports/public-issues-committee/final-report/1-statement-on-latin-america.html>

⁸ Statement on the responsibility to protect <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/plenary-presentations/committee-reports/public-issues-committee/responsibility-to-protect-statement.html>

that without basic human security and the satisfaction of human needs the affirmation of human rights loses its meaning.

d) Supports changes to the permanent membership of the UN Security Council that would make it more geographically, politically and culturally representative of today's world, and that would encourage working methods and decision-making processes that enable fair, effective, and timely responses to the needs of vulnerable people and to prevent the outbreak of violent conflict. All current and aspiring members of the UN Security Council should fully comply with the Nuclear Non-Proliferation Treaty.

e) Welcomes the establishment of the Peacebuilding Commission as a means of developing new and appropriate ways of responding to civil conflict. The Peacebuilding Commission should adopt and endorse peacebuilding principles and practices, which emphasise local ownership in peacebuilding and peacekeeping processes. These should also promote the full participation of women (in accordance with UN Security Council Resolution 1325), the marginalised groups, Indigenous Peoples, differently abled people and youth. At the same time, current disarmament forums and mechanisms must be strengthened and made more effective in advancing the already agreed global objectives of the elimination of nuclear weapons and of controlling conventional arms and arms transfers.⁹

The WCC, EDAN and emerging technologies:

In a recent WCC publication one reads:

" What does it mean to be human and to be part of God's creation? Responses that seemed to be clear and unshakeable for centuries are severely challenged by new scientific and technological developments. The ecumenical movement addressed some of these concerns very early as part of a study process that culminated in the 1979 Conference on Faith, Science and the Future in the Massachusetts Institute of Technology (Boston, USA) and later in a study document on biotechnology in 1989." (26)

The NCC states : " The Church historically responded to challenges by using new language and new ideas to more fully explain the truth. We must rise to contemporary challenges using the best tools and insights available, including those of modern science." (27)

However if one looks at the science and technology areas covered by WCC members today it seems that WCC members have lost their cutting edge in dealing with emerging technologies and a certain bias as to which emerging technologies are covered can be identified. It seems that there is an overweight in covering a) genetic technologies and b) technologies which one seem to be able to question under the heading 'pro life' and an underweight in the coverage of non-genetic based technologies and of technologies which can not be covered under the pro-life heading.

The ecumenical conversation and the mutirão on new technologies experience at the 9th assembly of the World Council of Churches allows for the conclusion that most of the technologies this e-book is describing are not on the agenda of most WCC members and the development and increasing usage and application of the transhumanist concept(8) seems to go on without knowledge of most WCC members.

Disabled people are strongly affected by the discourse around emerging technologies. however the pre-assembly of the EDAN network showed a critical lack of knowledge on the issues of emerging technologies and their impact on WCC in general and EDAN in particular.

⁹ <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/plenary-presentations/committee-reports/public-issues-committee/final-report/3-statement-on-un-reform.html>

The next section outlines problems with the scope, culture and language of the critique of emerging technologies voiced so far by WCC members especially in regards to disabled people.

WCC member statements on genetics in relation to disabled people:

To identify **biased and discriminatory language** is a good starting point to ascertain the impact of WCC member statements on genetics in regards to disabled people.

Biased Language:

Many examples of biased able-ist(19) ability-normocentrist language exist within the documents of WCC members. To just give two examples (biased terms are highlighted in red).

We read in the 1989 Biotechnology report of the WCC (28):

"One of the main areas of application is in prenatal genetic diagnosis. It is used primarily by families that have a **known risk** of hereditary **defects**, and by women of 35 years or over who are generally believed to have a **higher risk** of giving birth to a child with a **genetic disorder**. Also, some people just have a general fear, or are looking for specific information such as the child's sex. About 3% of all foetuses tested show the symptoms of a **severe genetic disease**. Confronted with the results of the diagnosis, pregnant women, in a few cases, have the options of **therapeutic or preventive measures**, or in most cases, the birth of a **handicapped child or abortion**. Genetic counselling can be a key element in the decision making process."

"Prenatal diagnosis gives rise to special social and ethical concerns. They center about the eugenic judgments on what **genetic abnormality**, if any, justifies the abortion of a given foetus."

"More disturbing than the controversy over severe genetic defects are the clear indications from around the world that pre natal screening is being used for sex selection"

"In state sponsored pre natal testing, the major concern is whether the state may be openly, or covertly encouraging the abortion of **genetically abnormal** foetuses."

"As with somatic gene therapy, the aim of the genetic alteration of the human germline will be to eradicate various **genetic disorders**. However, this **otherwise beneficial aim** is seriously clouded by several scientific problems."

In the report "Making Good Decisions In Biotechnology: Stem Cell Research, Cloning and Genetic Information" by the Inter Church Bioethics Council (ICBC) of New Zealand(29) one reads:

"It is also suggested that ultimately tissues produced from stem cells may be used to repair damaged tissues and even to produce replacement organs, thereby assisting **sufferers of burns, muscular degeneration, cancer, immunodeficiencies, inherited blood diseases, osteoarthritis, spinal cord injury, diabetes, heart failure, liver failure, kidney failure, Alzheimer's disease, Parkinson's disease, multiple sclerosis and other neurodegenerative diseases.**" P3

"Most of us would know of someone who is **suffering from one or more of these illnesses**. So what's the problem? Surely we want **sufferers of these debilitating or disfiguring health problems** to be helped?" p3

"Should it be used to select offspring with particular characteristics, or to select against embryos that may be defective?" p4

", eg if a parent who carries **defective genes** considers his/her genetic information is confidential to them, lack of this knowledge may affect children who may have **inherited the defective genes.** " p4

"who work with people suffering from serious diseases" p5

"and the disability is as major as a spinal cord injury."p5

Brian: I heard of a case where the woman so hated her sister she rejoiced in the fact that her sister might have a child with a **serious genetic disease.**p20

Many embryos that do spontaneously abort have a high incidence of genetic (particularly chromosomal) abnormality. However, these **abnormal** embryos have still formed through fertilisation and therefore are as fully human as a child with a severe handicap. The value of human life is not dependent on its level of **abnormality**. Society cares for the handicapped once they have been born – the same care and protection should be extended to a human life before it has been born. (30)

Biased **ability-normocentrist** language can also be found in The EUROPEAN ECUMENICAL COMMISSION FOR CHURCH AND SOCIETY report on CLONING ANIMALS AND HUMANS(31), The Executive Committee of EUROPEAN ECUMENICAL COMMISSION FOR CHURCH AND SOCIETY on 26 November 1998 in MEDICALLY ASSISTED PROCREATION AFTER 20 YEARS(32); Reformed Church in America in 2001 Genetic Testing and Screening MGS 2001, pp. 376-385(33)

The language of discrimination: The usage of the term serious:

The term serious is often used to justify the distinction between therapeutic and non-therapeutic eugenics:

Many examples of a discriminatory approach to characteristics of the Homo sapiens body exist within documents of WCC members.

The Position Paper of the EUROPEAN ECUMENICAL COMMISSION FOR CHURCH AND SOCIETY MEDICALLY ASSISTED PROCREATION AND THE PROTECTION OF THE HUMAN EMBRYO from 1996 (34) states:

"However, it makes sense, here, to distinguish between therapeutic and non-therapeutic eugenics. The possibility of **preventing severe congenital diseases and disorders** may be welcomed, although there will be a "grey area" between both forms of eugenics. We would suggest that, at least at first, until the "grey area" is better understood and clearer distinctions can be made, research and clinical efforts should be concentrated on the **most obvious therapeutic cases, severe and life-threatening congenital diseases.**"

The Church of Scotland Looking at the ethics of technology for a New Millennium in their report Moral and Ethical Issues in Gene Therapy Is somatic gene therapy be ethically acceptable?(35) states:

"Subject to such proper precautions, there would seem no more reason to object on ethical grounds to gene therapy than any existing therapy for a **serious disease**. On the contrary, as Christians we would strongly encourage efforts for the alleviation of the **suffering of those with such diseases.**"

The Church of Scotland Looking at the ethics of technology for a New Millennium in their report "Designing Away the Gift of Life"(36) states:

"These draw a clear line between a serious medical condition and consumer preference".

Other documents which use similar language are The NATIONAL COUNCIL OF THE CHURCHES OF CHRIST IN THE U.S.A(37) and the Lutheran Church of Australia(38) COMMISSION ON SOCIAL & BIOETHICAL QUESTIONS Discussion Paper and the Executive Committee of EUROPEAN ECUMENICAL(32) COMMISSION FOR CHURCH AND SOCIETY EECCS in MEDICALLY ASSISTED PROCREATION AFTER 20 YEARS on 26 November 1998,

The language of discrimination: Prohibition of sex selection:

One of the consequences of the biased ability-normocentrist language and thinking is the demand to make a distinction between sex selection on the one hand and ability selection/perceived impairment deselection on the other hand. Many secular groups make this distinction(39-42) the World Medical Association just being one of them (43). Furthermore many legal documents and international declarations demand the prohibition of sex selection but not the prohibition of ability selection/perceived impairment deselection (40-42; 42; 44; 45).

WCC members also seem to draw that line.

The 2003 General Assembly of the Church of Scotland(46)states:

"So the Assembly voted to urge the Government to bring sex selection under the regulatory control of the Human Fertilisation and Embryology Authority and be made illegal except where serious hereditary gender-related disease is to be avoided in accordance with the European Convention on Human Rights and Biomedicine"

The CHURCH OF SCOTLAND GENERAL ASSEMBLY 2002 REPORT BOARD OF SOCIAL RESPONSIBILITY MAY 2002(47) states in Section 7 iv

"Recognise that sex-selection may be acceptable when it is done in order to preclude **serious sex-linked disease**, but reject sex-selection when it is done to give parents a child of their preferred sex;"

The 1989 WCC report "BIOTECHNOLOGY: ITS CHALLENGES TO THE CHURCHES AND THE WORLD."(28) recommended:

- a) Calls for the prohibition of genetic testing for sex selection, and warns against the potential use of genetic testing for other forms of involuntary social engineering.

Other documents with the same language can be found in (36; 46; 48)

The language of discrimination: Prohibition of genetic discrimination:

A variety of statements exist internationally which denounce after birth genetic discrimination whereby genetic discrimination is interpreted as discrimination against people based on a genetic predisposition for a devalued genetic characteristic. (39; 49) Genetic discrimination does not include discrimination against people who exhibit the phenotype of the devalued genetic characteristic. Despite the obvious problems for disabled people with this definition(39; 49) it is interesting that although the 1989 WCC report called "BIOTECHNOLOGY: ITS CHALLENGES TO THE CHURCHES AND THE WORLD"(28)"drawn attention to ways in which knowledge of an individual's genetic make up can be, and in some cases, is being abused by becoming the basis for unfair discrimination, for example, in work, health care, insurance and education" I could not find any document demanding the prohibition of genetic discrimination.

Other Issues such as gene therapy, genetic enhancement:

Linking genetic testing to cost:

The Report of the Commission on Christian Action of the Reformed Church(33) stated:

"The outlook for the benefits of genetic testing and screening is optimistic. Genetic testing and screening has an enormous potential to contribute in a positive way to human society and individual lives. It can lead to increased quantity and/or quality of life, has the potential to reduce health care costs, and it is the first step in gene therapy or gene replacement technology,"

"Genetic testing and screening should be available to all whom it could benefit, regardless of their income level. To that end, public policy must assure that health care programs for the poor provide necessary funds to pay for equal access to genetic testing and its benefits. "

Taking together these two quotes the implications are troubling. Not only is cost prevention used as a rationale for allowing and promoting the testing and screening without even stating for what one should test, the two quotes can also be interpreted as targeting the 'poor' with new eugenic measures, to quality control the 'poor' so their children do not cost the system any money..

Another troubling quote of the report is the below:

" Gene therapy/replacement contains additional ethical concerns and in that light genetic testing and screening may actually lead to pharmacogenetic treatments and decreased need for gene therapy. Pharmacogenetics is a new area of research that uses specific genetic information for a patient to design drugs that will act best for that particular individual with their unique genetic structure. Genetic testing is one of the first steps in pharmacogenetics."

This comment further individualizes medicine something which most people in the USA and for sure in low and even middle income countries won't be able to afford.(50)

The report lists some recommendations

R-106

To encourage RCA congregations to identify genetic counselors and other resource people in their communities who can help church members with education, guidance, and support concerning the issues of genetic testing and screening. (ADOPTED)

R-107

To encourage RCA seminaries to include in their curricula opportunities for study and discussion of the ethical issues raised by new genetic technologies. (ADOPTED)

R-108 (amendment)

To request that congregations send to the Office of Social Witness the names of genetic counselors, scientists, health professionals, Christian ethicists, and others who could serve as resource people and/or represent the denomination in ecumenical forums and dialogues concerning the issues raised by new genetic technologies. (ADOPTED AS AMENDED)

R-110

To request that the Office of Social Witness compile a summary of previous General Synod statements on genetics and related issues and make this available to the church. (ADOPTED)

It is of interest to note that disabled people are not identified as resource people

The NATIONAL COUNCIL OF THE CHURCHES OF CHRIST IN THE U.S.A. (37) came up with a Resolution Establishing an Exploratory Commission on Human Genetic Technologies

"1. The new human genetic technologies are a threshold challenge for humanity. If used properly they hold great promise for preventing disease and alleviating suffering. If abused they could open the door to a powerful new eugenics that would objectify human life and undermine the foundations of human civil society."

It is of interest to note that the quote is written in such a way that it sees the positives of genetic technology as a given, but negative consequences only as a probability.

"2. The rapid development of these technologies has created a "civil society deficit." There are few broadly-based citizen organizations or movements arguing for human genetics policies based on human rights, social and economic justice and global inclusion. "

Indeed and here is the chance for WCC to promote that angle which they are starting to do.

"3. In recent years advocates of a new eugenic future for humanity have become increasingly vocal and explicit. "

"4. Bans on the most dangerous eugenic technologies need not impede potentially beneficial medical applications. "

"The two most troubling new human genetic technologies are Inheritable Genetic Modification (IGM) and Reproductive Human Cloning."

"* IMPORTANT: IGM is NOT needed to allow couples at risk of passing on a genetic disease a way to avoid doing so. Other methods, notably pre-implantation screening, are available to do that more readily. IGM would only be needed if parents wanted to create a child with traits for which neither of them carried genes. That is, it would be necessary if, and only if, they wanted to create a genetically enhanced child. "

"A. Many applications of genetic science are benign and beneficent and are widely supported. These include many applications involving pharmaceuticals, diagnostics, non-inheritable genetic modification for medical purpose, fertility therapeutics, and forensics."

"What Policies Do We Need?"

Most knowledgeable persons agree that a minimal core of social policies are needed to protect humanity from the most dangerous applications of the new human genetic sciences, while allowing us to realize the positive medical applications. Such policies presently address:

1. national and global bans on reproductive human cloning
2. national and global bans on inheritable genetic modification (IGM)
3. effective, accountable regulation of all other human genetic technologies"

This is a much too limiting and vague statement and sounds like an endorsement for preimplantation genetic diagnostic.

Genetics and the role of disabled people: A case study

The National Council of Churches USA explicitly covered 'disabled people' in its **NOVEMBER 8, 2006 adopted** FEARFULLY AND WONDERFULLY MADE: A POLICY ON HUMAN BIOTECHNOLOGIES quite extensively(51) However its an uneaven read. The yellow highlights some positive language the red highlights problematic language and reasoning I deal with in detail after the quote.

401 B) Perception of Disability

402 The promise and danger of biotechnology is perhaps nowhere more obvious than
403 the ways in which it affects people with disabilities and their families. **There is no**
404 **one “disability” perspective on the use of biotechnology.** People with disabilities
405 and their families are first of all people, with different values, theologies, and
406 understandings about the purpose of life and God’s call to care for one another.
407 The use of tools and processes declared to be neutral and value free, and designed
408 **to relieve suffering,** holds great promise when they **can support the lives of people**
409 **with disabilities** or **alleviate unnecessary pain or suffering.** But biotechnology
410 becomes profoundly disquieting to many with disabilities when disabling
411 conditions or predictions are equated with lifelong suffering, imperfection, or
412 disease. When those personal and social values are combined with the power of
413 **technology to prevent the birth of a child with a disability or defect, the possibility**
414 **of a new eugenics fueled by social values, market forces, and personal choice,**
415 **rather than official policy, becomes quite real.**

416

417 Our reflection causes us to challenge the assumptions that everything needs to be
418 “fixed” or “improved,” that we know how best to do this, and that just because
419 something can be done means it ought to be done. Science cannot save us from
420 finitude. **The presupposition for life and appreciation of the whole human person**
421 **as an entity argue for society to offer no disincentives to reproduction by and of**
422 **persons with disabilities, in the absence of deliberate cruelty and undue hardship.**

423

424 Among the principles that have been identified by those with disabilities that
425 ought to guide application of biotechnologies are the following, which we affirm:

426 1. The use of new human genetic discoveries, techniques and practices
427 should be strictly regulated to avoid discrimination and protect fully,
428 and in all circumstances, the human rights of people with disabilities.

429 2. **Genetic counseling that is nondirective and rights-based should be**
430 **widely available and should reflect the real experience of disability.**

431 3. **Parents should not be formally or informally pressured by medical,**
432 **insurance or governmental policy to take prenatal tests or undergo**
433 **“therapeutic” terminations.**

434 4. Organizations of people with disabilities must be represented on all
435 advisory and regulatory bodies dealing with human genetics.

436 5. The human rights of people with disabilities who are unable to consent
437 are not to be violated through medical interventions.

In its recommendations one reads

671 The National Council of Churches calls upon its member
672 communions to:

681 4. Identify clergy and lay members who are health-care professionals,
682 geneticists and molecular biologists, genetic counselors, and members of
683 families with experience in health-care matters, and recruit them as
684 resources for clergy and congregations who are facing biotechnology
685 issues, particularly as the Church encounters these issues on an
686 increasingly frequent and ongoing basis.

687 5. Develop worship materials that address the emerging needs created by the new biotechnologies and the issues they present, including: 688

a. Prayers and liturgical materials that provide solace and comfort to those who struggle with loss and distress related to genes, inherited conditions, parenting and the issues raised by genetic screening and testing, and other related pastoral concerns. 689 690 691 692

b. Prayers and liturgical materials that are appropriate for an evolving self-understanding of our biological lives, life cycle, and occasions of transition or decision. 693 694 695

c. Prayers of petition related to aspirations pertaining to genetic testing and screening, and medical treatments with genetic/intergenerational implications. 696 697 698

d. Prayers for scientists, both petitions for their blessing and for their personal use in devotions. 699 700

The National Council of Churches calls upon congregations of our member communions to: 704 705

1. Provide study opportunities for congregation members to become acquainted with issues related to biotechnologies, making use of the gifts of scientists, genetic counselors, physicians, people with disabilities and others that can help Christians understand, and respond to, these issues. 706 707 708 709

Parish priests, pastors, and others serving congregations are encouraged to: 722 723

Recognize that genetics and bioengineering raise a number of pastoral and theological questions with which they, as clergy, are frequently and traditionally involved. Those include: 724 725 726

1. An understanding of the value and worth of every person and the pastoral roles in developing an appreciative stance toward the gift of life, in all its diversity, and in shaping our identity as both individuals and as a people of faith. 727 728 729 730

The National Council of Churches calls upon the theological seminaries of member communions and others engaged in theological education to: 739 740 741

1. Provide instruction to those preparing for church vocations regarding ethical considerations raised by current biotechnologies, including their implications for both individuals and society, and to provide ongoing engagement of emerging questions prompted by current and future research. 742 743 744 745 746

2. Expand opportunities for continuing education for clergy and health-care professionals who are interested in developing expertise in addressing the spiritual, theological, pastoral, and ethical dimensions of bioengineering capabilities. 747 748 749 750

3. Provide instruction about the impact of biotechnological advances on society and the Church and their ethical implications for pastors in engaging individuals and society. 751 752 753

4. Identify scientists within our member communions as a valuable interpretive and analytic resource to the Church. 754 755

5. Work toward creation of a national center on theology and genetics based 756 within an appropriate research and training center that would coordinate 757 its development, bring resources together, work as a collaborative pastoral 758 voice in the wider social dialogue about genetic and biotechnological 759 issues, and sponsor both research and training that will empower clergy, 760 congregations, scientists, and families as they seek to respond as people of 761 faith to these new frontiers of human identity, scientific research, human 762 technology, and theological understanding. 763
764

The National Council of Churches calls on medical practitioners, 765 health-care professionals, and researchers to: 766

1. Remain in ongoing dialogue with persons of broad religious backgrounds 767 about the impact of emerging biotechnologies and their impact on 768 religious sensibilities. 769
2. Recognize that the powerful technologies under their charge can be used 770 for evil as well as good, and that decisions made in laboratories about how 771 to use human genes can affect all humanity, both for good and for ill. 772
3. Update and revise guidelines pertaining to informed consent as 773 appropriate to advances in research, clinical trials, and clinical practice, 774 and in accordance with the highest standards. 775
4. Formulate plain-language standards for these technologies, so that as 776 broad a public as possible is included as a partner in this science. 777

However the language has numerous problems e.g.

It states

403 “**There is no**
404 **one “disability” perspective on the use of biotechnology.”**

What does that mean? Does that mean we listen only to certain parts? Or ignore certain views as other views exist. It’s like saying there is no one ‘women’ perspective on women rights’.

407 The use of tools and processes declared to be neutral and value free, and designed
408 to relieve **suffering**, holds great promise when they can support the lives of people
409 with disabilities or **alleviate unnecessary pain or suffering**.

What is suffering? And unnecessary pain? Is this language an endorsement for prebirth genetic elimination as it might be seen by some to alleviate unnecessary pain or suffering.?

413 technology to prevent the birth of a child with a disability or defect, **the possibility**
414 **of a new eugenics fueled** by social values, market forces, and personal choice,
415 rather than official policy, becomes quite real.

Why possibility of a new eugenics? We have mainstreamed eugenics that is a fact not a possibility.

420 The presupposition for life and appreciation of the whole human person
421 as an entity argue for society to offer no disincentives to reproduction by and of
422 persons with disabilities, in the absence of **deliberate cruelty and undue hardship**.

This seems to go against line 407-410 by questioning eugenics however what is undue hardship. US legal decisions around wrongful birth see a disabled child as undue hardship and many including bioethicists see the birth of a disabled child as deliberate cruelty

429 2. Genetic counseling that is nondirective and rights-based should be
430 widely available and should reflect the real experience of disability.

It is well accepted within the academic discourse that non-directive counselling is not possible. And what does rights based mean?

431 3. Parents should not be formally or informally pressured by medical,
432 insurance or governmental policy to take prenatal tests or undergo
433 “therapeutic” terminations.

But there are many other places of informal pressure. Ones neighbour ones family ones workplace ... all of that is missing here.

681 4. Identify clergy and lay members who are health-care professionals,
682 geneticists and molecular biologists, genetic counselors, and members of
683 families with experience in health-care matters, and recruit them as
684 resources for clergy and congregations who are facing biotechnology
685 issues, particularly as the Church encounters these issues on an
686 increasingly frequent and ongoing basis.

It is interesting that under recommendations (line 681-686) disabled people and disability /ability scholars are not listed.

687 5. Develop worship materials that address the emerging needs created by
the new biotechnologies and the issues they present, including: 688
a. Prayers and liturgical materials that provide solace and comfort to 689
those who struggle with loss and distress related to genes, inherited 690
conditions, parenting and the issues raised by genetic screening 691
and testing, and other related pastoral concerns. 692
b. Prayers and liturgical materials that are appropriate for an evolving 693
self-understanding of our biological lives, life cycle, and occasions 694
of transition or decision. 695
c. Prayers of petition related to aspirations pertaining to genetic 696
testing and screening, and medical treatments with 697
genetic/intergenerational implications. 698
d. Prayers for scientists, both petitions for their blessing and for their 699
personal use in devotions. 700

The content of line 687-700 has potential but one would have to see the sworship material to see how useful they will be.

1. An understanding of the value and worth of every person and the 727
pastoral roles in developing an appreciative stance toward the gift of life, 728

in all its diversity, and in shaping our identity as both individuals and as 729
a people of faith. 730

Yes this would clearly denounce eugenic practices but it seems not to fit with other language in the document.

2. Expand opportunities for continuing education for clergy and health-care 747
professionals who are interested in developing expertise in addressing the 748
spiritual, theological, pastoral, and ethical dimensions of bioengineering 749
capabilities. 750

Why just clergy and health-care professionals?

The study document accompanying the adopted policies (52) has similar problems with the language as outlined for the above document.

The NCC tried hard it seems but the end result is more than questionable.

Setting the Stage II: Today and the Future: From Nanotech to Nanoscale Technology and Sciences(53)

The term "nanotechnology" was originally coined to describe a way to manufacture something from atomic molecules (like the food replicator in many science fiction films, where one says "coffee" and the machine builds, synthesizes the coffee molecule by molecule).

According to Nanotechnology Now¹⁰:

"At the most basic technical level, MNT is building, with intent and design, and molecule by molecule, these two things: 1) incredibly advanced and extremely capable nano-scale and micro-scale machines and computers, and 2) ordinary size objects, using other incredibly small machines called assemblers or fabricators (found inside nanofactories). In a nutshell, by taking advantage of quantum-level properties, MNT allows for unprecedented control of the material world, at the nanoscale, providing the means by which systems and materials can be built with exacting specifications and characteristics."

"MNT represents the state of the art in advances in biology, chemistry, physics, engineering, computer science and mathematics. The major research objectives in MNT are the design, modeling, and fabrication of molecular machines and molecular devices. The emergence of MNT -- both infant and mature -- has numerous social, legal, cultural, ethical, religious, philosophical and political implications. At the most basic social level, MNT is going to be responsible for massive changes in the way we live, the way we interact with one another and our environment, and the things we are capable of doing.

Nanotechnology is now generally known as "molecular manufacturing" or "molecular nanotechnology." In sales strategies by companies and others, the term "nanotechnology" has evolved into a different meaning. It is used today to mean "nanoscale technology" and "nanoscale sciences" covering research and development products, ideas and processes with controlled size below 300nm or in some cases below 100nm. In the U.S. the National Nanotechnology Initiative funds mostly nanoscale technology

¹⁰ <http://www.nanotech-now.com/>

and sciences today. Most policy, ethics and research papers, economic impact forecasts and funding figures use "nano" to mean "nanoscale." Many nano-taxonomies exist (53) which show the numerous fields, processes and products covered under 'nano' today. To quote just one [example](#):

Enabling science and technology

Nanofabrication -- Methods for making materials, devices and structures with dimensions less than 100 nm.

Nanocharacterisation and nanometrology -- Novel techniques for characterisation, measurement and process control for dimensions less than 100 nm.

Nano-modelling -- Theoretical and numerical techniques for predicting and understanding the behaviour of systems and processes with dimensions less than 100 nm.

Properties of nanomaterials -- Size-dependent properties of materials that are structured on dimensions of 100 nm or below.

Devices, systems and machines

Bionanotechnology -- The use of nanotechnology to study biological processes at the nanoscale, and the incorporation of nanoscale systems and devices of biological origin in synthetic structures.

Nanomedicine -- The use of nanotechnology for diagnosing and treating injuries and disease.

Functional nanotechnology devices and machines -- Nanoscale materials, systems and devices designed to carry out optical, electronic, mechanical and magnetic functions.

Extreme and molecular nanotechnology -- Functional devices, systems and machines that operate at, and are addressable at, the level of a single molecule, a single atom, or a single electron.

Nanotechnology, the economy, and society

Nanomanufacturing -- Issues associated with the commercial-scale production of nanomaterials, nanodevices and nanosystems.

Nanodesign -- The interaction between individuals and society with nanotechnology. The design of products based on nanotechnology that meet human needs.

Nanotoxicology and the environment -- Distinctive toxicological properties of nanoscaled materials; the behaviour of nanoscaled materials, structures and devices in the environment.

All taxonomies show clearly that "nano" relates to many areas of life -- from how we live human life and perceive it, to how we interact with other biological and non biological matter in our environment, to how that matter reacts towards us. It impacts every human being, and -- in the end -- every species. It is obvious that nano will converge with other science and technologies such as BICS (bio, info, cogno and synbio), and the convergence will enable nano and BICS beyond their individual capabilities -- leading to products, processes, and social, ethical, legal, economic, and environmental implications beyond the individual impacts of Nanotechnology, Biotechnology, Information Sciences, Cognitive Science and Synthetic Biology (NBICS).

The National Nanotech Initiative (USA) envisions applications for NBICS products in areas such as the environment, energy, water, weapons and other military applications, globalization, agriculture, health (more efficient diagnostics and genetic testing, cognitive enhancement; life extension, enhancing human performances in general) (7) each of which come with their own sales pitches, social consequences, problems and implications. Others such as the social group of transhumanist believe that advances in NBICS hold the key for extreme life extension to the level of immortality and the achievement of morphological(9), 'full reproductive' (see e.g. artificial womb research(54)) and genomic freedom. (10) A list of many anticipated Nanoproducts can be found here (5;6)

The U.S. government spent nearly twice as much on nanotechnology in 2004 as it did on the Human Genome Project (HGP) in its peak year. Predictions are that expenditures in

Nanotechnology will soon outstrip investments to date in Genomics and Biotechnology (55)

“By the end of 2005 governments had sunk eighteen billion dollars (US\$18 billion) of taxpayers’ money into nanotechnology R&D. With an additional six billion dollars (US\$6 billion) forecast for 2006, nanotechnologies will then have received the same level of funding in absolute dollar terms as the entire Apollo program”(56). Many middle-income countries such as India(57), China(58) and others (59) are increasingly involved in nanotechnology. A Global R&D Report ‘Changes in the R&D Community’ by Battelle and published by R&D Magazine(60) puts China in 4th place behind India, Japan and the US in R&D spending(61).

| Global R&D Spending | | | | | |
|---|--------------------------------------|---------------------------------------|--|--|--|
| | GDP PPP 2005 billions, \$ | R&D % GDP 2005 percent | R&D PPP 2005 billions, \$ | R&D PPP 2006 billions, \$ | R&D PPP 2007 billions, \$ |
| Americas | 15,874 | 2.3 | 369.07 | 379.69 | 387.64 |
| U.S. | 12,192 | 2.6 | 319.60 | 328.90 | 335.50 |
| Asia | 19,086 | 1.8 | 341.30 | 361.85 | 384.01 |
| China (Mainland) | 8,859 | 1.4 | 124.03 | 136.30 | 149.80 |
| Japan | 3,890 | 3.2 | 124.48 | 127.84 | 131.29 |
| India | 3,611 | 1.0 | 36.11 | 38.85 | 41.81 |
| Europe | 12,764 | 1.8 | 236.09 | 240.16 | 244.42 |
| Germany | 2,388 | 2.5 | 59.68 | 60.21 | 60.75 |
| France | 1,879 | 2.2 | 41.36 | 42.10 | 42.86 |
| UK | 1,933 | 1.9 | 36.72 | 37.39 | 38.06 |
| Other | 2,276 | 1.4 | 31.88 | 33.76 | 35.68 |
| World | 50,002 | 2.0 | 978.34 | 1,015.46 | 1,051.75 |
| Share of Total Global Research and Development | | | | | |
| | 2005 | 2006 | 2007 | | |
| Americas | 37.7% | 37.5% | 36.8% | | |
| U.S. | 32.7% | 32.4% | 31.9% | | |
| Asia | 34.9% | 35.6% | 36.5% | | |
| China | 12.7% | 13.4% | 14.8% | | |
| Japan | 12.7% | 12.6% | 12.5% | | |
| India | 3.7% | 3.8% | 4.0% | | |
| Europe | 24.1% | 23.6% | 23.2% | | |
| Germany | 6.1% | 5.9% | 5.8% | | |
| Other | 3.3% | 3.3% | 3.5% | | |
| World | 100.0% | 100.0% | 100.0% | | |
| Source: R&D Magazine, Battelle, OECD, World Bank | | | | | |

(60)

Many countries are increasingly involved in NBIC. (see Table)

Table . Global distribution of nanotechnology activity by country and classification.(59)

| Least Developed | Other: Developing | Transitional | Developed |
|--------------------------------|--|--|---|
| National Activity or Funding | Argentina; Armenia; Brazil; Chile; China; Cost Rica; Egypt; Georgia; India; Iran; Mexico; Malaysia; Philippines; Serbia & Montenegro; South Africa, Thailand, Turkey; Uruguay; Vietnam | Belarus; Bulgaria; Cyprus; Czech Republic; Estonia; Hong Kong; Hungary; Israel; Latvia; Lithuania; Poland, Romania; Russian Federation; Singapore; Slovak Republic; Slovenia; South Korea; Ukraine | Australia; Austria; Belgium; Canada; Denmark; Finland; France; Germany; Greece; Iceland; Ireland; Italy; Japan; Luxembourg; Netherlands; New Zealand; Norway; Portugal; Puerto Rico; Spain; Sweden; Switzerland; Taiwan; United Kingdom; United States of America |
| Individual or Group Research | | | |
| Bangladesh | Botswana; Columbia; Croatia; Cuba; Indonesia; Jordan; Kazakhstan; Moldova; Pakistan; Uzbekistan; Venezuela | Macau, (China); Malta; United Arab Emirates | Liechtenstein |
| Country Interest | | | |
| Afghanistan; Senegal; Tanzania | Albania; Bosnia and Herzegovina; Ecuador; Ghana; Kenya; Lebanon; Macedonia; Sri Lanka; Swaziland; Zimbabwe | Brunei Darussalam | |

The 2006 Lux report (62) states the following:

| Governments | Nanotechnology spending 2005 |
|---------------------------------|------------------------------|
| North America (nearly all USA) | \$1.7 billion (36%) |
| Asia ((dominated by Japan) | \$1.7 billion (36%) |
| Western Europe (led by Germany) | \$1.1 billion (26%) |
| Rest of the World | \$0.1 Billion (2.1%) |

| Established Corporations | Nanotechnology spending 2005 |
|---------------------------------|------------------------------|
| North America (nearly all USA) | \$1.9 billion (42%) |
| Asia ((dominated by Japan) | \$1.7 billion (38%) |
| Western Europe (led by Germany) | \$0.85 billion (19%) |
| Rest of the World | \$0.07 Billion (2.%) |

Beside that the above shows a gap in nanofunding between countries which is of course to be expected one finds also a hierarchy of funding in regards to NBICS applications. According to Lux research(62) electronics and IT deals lead with 40% of VC investment in 2004 and 2005, followed by life sciences as close second, and materials and nanotools as a distant third and fourth, respectively.

This hierarchy in funding by VC stated by Lux is also reflected in the figures of Nanotech R&D in Europe where Nanobio/Nanomedicine is second to Nanoelectronics.

Nanobio is one of -if not often- the biggest pieces in the pie if one looks at Nano funding based on applications. (63-65)

Setting the Stage III Today and the Future: Other Technologies

Synthetic biology (66)

Some definitions of Synthetic Biology

- the design and construction of new biological parts, devices, and systems. (67)
- the re-design of existing, natural biological systems for useful purposes. (67)
- Synthetic biologists come in two broad classes. One uses unnatural molecules to reproduce emergent behaviours from natural biology, with the goal of creating artificial life. The other seeks interchangeable parts from natural biology to assemble into systems that function unnaturally. (68)

Generating biological structures/life forms from the bottom up by designing artificial DNA and new artificial letters for the standard four-letter DNA (A,C,G,T) -- allowing for more complex organisms than exist today -- is certainly a big part of the synthetic biology field.

One can easily envision that on the one hand new biological structures/life forms will be modified by adding products from other non-genetic fields; and that on the other these newly designed biological structures/life forms will be added to non-biological structures. Indeed, the linkage of synthetic biology with artificial life was one of the focuses of discussion at the 10th Artificial Life X Conference¹¹ which was held June 3-7, 2006 at Indiana University. It will be interesting to see future listings in the 'Registry of Standard Biological Parts'¹².” ETC-Group just published a in depth look at synthetic biology(21) and the European Commission published a piece comparing Europe and North America(22). It is obvious from the writings and applications around synthetic biology that it deserves a lot of attention. As ETC Group writes “A new report by the ETC Group concludes that the social, environmental and bio-weapons threats of synthetic biology surpass the possible dangers and abuses of biotech.”¹³

The emerging field of synthetic biology received a big boost in the form of a \$42.5 million grant from the Bill & Melinda Gates Foundation. (69)

¹¹ <http://www.alifex.org/>

¹² http://parts.mit.edu/registry/index.php/Main_Page

¹³ <http://www.etcgroup.org/en/materials/publications.html?id=602>

As Herrera states: "In July 2002, researchers at the State University of New York announced that they had synthesized the deadly and virulent polio virus. This event, which was criticized by scientists and ethicists alike, marked the first time an organism was created entirely from off-the-shelf materials and instructions. SUNY researchers say they did it to illustrate just how easy it is for scientists to construct life—and for would-be terrorists to construct bioweapons. Synthetic biology also represents the ability to construct artificial life forms that are not modeled on anything found in nature, and whose benefits and hazards are consequently only theoretical. There is no bioethical road map for constructing synthetic organisms one gene at a time." (70)

I have outlined an existing vision of applications and dangers of synthetic biology in appendix 1 at the end of the paper for readers who are interested.

Artificial womb

In 2003, in an experiment by Liu director of the Reproductive Endocrine Laboratory at Cornell University's Center for Reproductive Medicine and Infertility a mouse embryo grew almost to full term in one of Liu's artificial wombs. (71) Liu thinks there will be a viable mouse womb within 5-10 years with a human one to follow. (72) Some bioethicists see problems with the artificial womb, others wait for them (73) Some feminists (74) and ethicists (75) see the artificial womb not as a way to free women from pregnancy, but a means to rid the human race of females completely. (76). I myself would see the artificial womb, in particular, problematic for women who live in societies which perceive them as a second or lower class of human beings.

Brain machine Interfaces

Scientists have demonstrated in 2002 that human thoughts can be converted into radio waves and used by paralyzed people to create movement. (77) "Unable to move, Matthew Nagle can play Tetris, draw and turn on the TV using the chip in his brain." (78) One team implanted miniature transmitters into the brains of terminally ill people suffering from degenerative conditions that rendered them unable to communicate. Their thoughts alone enabled them to create movement. It was said: "Ultimately the technology will be used for people whose spinal cords are destroyed in accidents or those handicapped by strokes." (77) "Scientists in Australia have developed a "mind switch" (79) that enables people to activate electrical devices (e.g. turn on a radio or open doors) by thinking." (80)

Following is the work of The IDIAP Research Institute, originally referred to as "Institute Dalle Molle d'Intelligence Artificielle Perceptive" (Dalle Molle Institute for Perceptual Artificial Intelligence). (81) As they state in a recent publication:

Brain activity recorded non-invasively is sufficient to control a mobile robot if advanced robotics is used in combination with asynchronous EEG analysis and machine learning techniques. Until now brain-actuated control has mainly relied on implanted electrodes, since EEG-based systems have been considered too slow for controlling rapid and complex sequences of movements. We show that two human subjects successfully moved a robot between several rooms by mental control only, using an EEG-based brain-machine interface that recognized three mental states. Mental control was comparable to manual control on the same task with a performance ratio of 0.74. (82)

Brain machine interfaces are no science fiction. The IEEE Trans. on Biomedical Engineering just had a Special Issue on Brain-Machine Interfaces, Vol. 51, Issue 6, June 2004.

The Dalle Molle Institute for Perceptual Artificial Intelligence is not the only ones working on brain machine interfaces. (83-87) There are others, such as the company Cyberkinetics, which received FDA approval to test their product "Brain Gate." (88) Researchers at Duke University Medical Center in Durham, North Carolina, are currently developing a wireless neuroprosthetic that could

potentially control robotic limbs for quadriplegics. They are also planning a brain-controlled electric wheelchair and a brain-operated keyboard. (89) Recently a whole issue of the journal of the Banff Centre of the Arts was dedicated to nanotechnology and the dream home. (90; 91),

The preceding discussion on brain–machine interfaces relates to disabled people; however, it is logical to expect that these devices will also be used by non-disabled people as a means to control their environment, especially if the brain–machine interface is non-invasive and no implants are needed as in the working model of the Dalle Molle Institute for Perceptual Artificial Intelligence.

Brain-Brain Interactions are envisioned by the NSF (USA)(7) and others(92).

Molecular manufacturing

The Centre for Responsible Nanotechnology states:

“Overview: Molecular manufacturing (MM) means the ability to build devices, machines, and eventually whole products with every atom in its specified place. Today the theories for using mechanical chemistry to directly fabricate nanoscale structures are well-developed and awaiting progress in enabling technologies. Assuming all this theory works—and no one has established a problem with it yet—exponential general-purpose molecular manufacturing appears to be inevitable. It might become a reality by 2010, likely will by 2015, and almost certainly will by 2020. When it arrives, it will come quickly. MM can be built into a self-contained, tabletop factory that makes cheap products efficiently at molecular scale. The time from the first fabricator to a flood of powerful and complex products may be less than a year. The potential benefits of such a technology are immense. Unfortunately, the risks are also immense.”(93) The Center for responsible Nanotechnology¹⁴ has identified some.

- Economic disruption from an abundance of cheap products
- Economic oppression from artificially inflated prices
- Personal risk from criminal or terrorist use
- Personal or social risk from abusive restrictions
- Social disruption from new products/lifestyles
- Unstable arms race
- Collective environmental damage from unregulated products
- Free-range self-replicators (grey goo)
- Black market in nanotech (increases other risks)
- Competing nanotech programs (increases other risks)
- Attempted relinquishment (increases other risks)

¹⁴ <http://www.cmano.org/>

Longevity, Immortality Technology

This is another area of scientific focus. The immortality Institute just published a set of essays on the issue⁽⁹⁴⁾ Some terms used in this context are cyber-immortality, emancipation from death, involuntary death, immortal-ism, immortal-ist morality. The book states:

Is it possible that scientists – or at least humankind – will “conquer the blight of involuntary death?” If so, to what extent will we succeed? What is in fact possible today, and what do the experts predict for the future? Is such a thing as ‘immortality’ feasible? Moreover, is it desirable? What would it mean from a political, social, ethical and religious perspective? This book will help to explore these questions.”

The book discusses biological theories of aging and biomedical strategies to counter it. It talked about alternative approaches such as medical nanotechnology, digitalization of personhood, and cryobiological preservation. The book also addressed questions that arise if radical life extension would become a reality. Would it create overpopulation, stagnation and perpetual boredom? How would it change our society, our culture, our values and our spirituality? If science allows us to vastly extend our life span, should we do so?

Although the book is written from a ‘we want it’ background, it allows for some insight into the debate.

Enhancement of Animals:

Arguments exist which would allow to ‘transcend animal limitations.’⁽⁹⁵⁾ Guido David Núñez-Mujica uses the following arguments in favor of enhancing animals

- It will give to other species the ability to choose their own future.
- It will help to make human beings aware that they are sharing the world with other beings.
- It will help to understand better to ourselves.
- Will enrich our lives with diversity of points of view, will give us new art and maybe new ways of thinking about the world.
- Will give more rights to the Enhanced species⁽⁹⁵⁾

He states further that it would be unethical to not enhance apes.

- Apes are sentient and self aware beings. If enhancing will give them better status and more rights than they have now, it would not be ethical prevent them from being modified and therefore, deny them rights.
- The extinction of apes will be a terrible loss of diversity and will harm us, enhancing can be most effective way of avoiding it in a certain way.⁽⁹⁵⁾

Nanofood, water and Forrestry(96-98)

The nano angle on water and food is of obvious interest to the AGAPE process and other areas of WCC and is covered under Secular development IX: Scientific and techno solutions for social problems. The nano angle on forrestry is as important. It is quite surprising how many strategy documents already exist in regards to nanoforrestry and how little one hears about it. A first International Conference on Nanotechnology for the Forest Products Industry¹⁵ took place in the United States last April. Talks included: "Bioinspired Nanotechnology: Green Chemistry and Sustainable Manufacturing," "Opportunities for Nanotechnology in Advancing Agenda 2020 Technology Platforms Panel," "What Else Might You Do With Nanofibrillar Cellulose Besides Make Nanocomposites?," "Advancing the Forest Biorefinery," "New Production Method for Nano Silica Sol and its Application for Papermaking," "Preparation of Biosilica-Enriched Filler and its Use in Nano-Particle Retention

¹⁵ www.nanotechforest.org/documents/NanotechConf.Brochurefinal2-9-06.pdf

System," "Potentials and Avenues for Nanotechnology in Canadian Wood Products," "Forest Products Industry Nanotechnology Workshop Report European Perspective: NanoForest," and "Application of Nanotechnology in Pulp and Paper in Japan." According to the Nanotechnology for the Forest Products Industry — Vision and Technology Roadmap,¹⁶ "potential uses for nanotechnology include developing intelligent wood -- and paperbased products with an array of nanosensors built in to measure forces, loads, moisture levels, temperature, pressure, chemical emissions, attack by wood decaying fungi, et cetera. Building functionality onto lignocellulosic surfaces at the nanoscale could open new opportunities for such things as pharmaceutical products, self-sterilizing surfaces, and electronic lignocellulosic devices. Use of nanodimensional building blocks will enable the assembly of functional materials and substrates with substantially higher strength properties, which will allow the production of lighter-weight products from less material and with less energy requirements. Significant improvements in surface properties and functionality will be possible, making existing products much more effective and enabling the development of many more new products. Nanotechnology can be used to improve processing of woodbased materials into a myriad of paper and wood products by improving water removal and eliminating rewetting; reducing energy usage in drying; and tagging fibers, flakes, and much research will be needed to move forward in this arena." A lot of thought has already been given to this field without much public visibility. A nanoforestry vision has been developed for Europe¹⁷, and the Canadian report Nanotechnology: Implications for the Wood Products Industry¹⁸ includes a chart summarizing a range of wood performance issues, and potential impacts of nanotechnology advances. In addition to creating new wood products, nanotechnology and nanoretooling will have a major impact in other areas, including the production of biofuel.

Nanoforestry, NBICS and biofuels(98)

Biofuel from biomass is seen as a renewable alternative to oil. Most biomass used for energy is plant derived. Plants produce biomass using energy from sunlight to combine water and carbon dioxide into sugars through photosynthesis. The sugars are then polymerised and/or combined with other chemicals to produce plant material. But which technologies will be used to create biofuel?

The keyword combination "genetically modified" and "biofuel" generates 343,000 hits in Google, and "nanotechnology" and "biofuel" produces 317,000, indicating that nanotechnology is rising in importance. A recent forest industry roadmap¹⁹ says that cell wall nanotechnology is a primary focus of nanoforestry, and that cellulose -- the building block of plant cell walls -- is key to developing biofuels. While genetic technology and biofuel are linked in the public consciousness, however, nanotechnology and biofuel are not.

It seems there is to be a disconnect between work on new technologies and their public visibility in applications of nanotechnology in forestry and biofuels, or synthetic biology in biofuels (where there is the potential to engineer bacteria to produce bacteriofuels²⁰, for example). Second, each application must consider many different technology options, their possible convergence, and their social and environmental impacts.

¹⁶ <http://www.fpl.fs.fed.us/highlighted-research/nanotechnology/forest-products-nanotechnology.pdf>

¹⁷ <http://www.stfi-packforsk.se/upload/3352/Finalroadhem.pdf>

¹⁸ <http://www.nanotechforest.org/documents/CanadaReportByForintekCanadaCorp.pdf>

¹⁹ www.fpl.fs.fed.us/...ogy--future-in-wood-products-industries.pdf ;

www.fpl.fs.fed.us/documnts/pdf2006/fpl_2006_moon001.pdf ; www.fpl.fs.fed.us/.../nr-2005apr04-nanotech-roadmap.html ;

www.fpl.fs.fed.us/.../forest-products-nanotechnology.pdf

²⁰ <http://seekerblog.com/archives/20070410/amyris-applies-synthetic-biology-to-biofuels/> ; <http://www.nest-idea.kpk.gov.pl/fetchfile.html?id=72>

Whatever one decides, the WCC must be multifaceted in their analysis. Foresight exercises are needed to see what technologies and challenges may be on the horizon. The discourse on biofuel, for example, needs to answer three questions: (1) should we use it? (2) what technology or mixture of technologies should we use to produce it, if any? and (3) what social and environmental challenges does this pose?

NBICS military products(99)

The world spends some \$1,000 billion annually on the military, of which around \$30-35 billion represents sales of military products. The U.S. Congressional Research Service reports on arms transfers to the developing world. Its 2006 report, *Conventional Arms Transfers to Developing Nations, 1998-2005*, says developing nations received two-thirds of foreign arms sales by weapons suppliers.

With so much money spent on the military and weapons, it was only a matter of time until nano-weapons raised interest. As one reads on the Nanowerk webpage, "All major powers are making efforts to research and develop nanotechnology-based materials and systems for military use." Most European and Asian countries have nanotech projects integrated within other military projects. Sweden and the USA have dedicated nanotechnology defence research projects. According to Nanowerk, the U.S. Department of Defense (DoD) spends well over 30% of all federal investment dollars in nanotechnology. In 2006, estimated DoD nanotechnology expenditures will be \$436m. About \$1m will be spent on risk-related research.

On the Swedish Defence Nanotechnology Programme one finds the following description: "With the help of nanotechnology, sensors and protection within the new networked defence will be improved. This is the challenge set for this five-year programme, which starts 1 October 2003. Researchers within the field of nanotechnology, both in Sweden and internationally, have been invited to participate. Seven projects have been chosen for a two-year term. In the autumn of 2005 the scope of the programme will be focused further for the next three years. The researchers will through demonstrations prove their concepts and ideas. The overall aim is to create an enhanced defence organisation. In addition to funding promising research projects, secondary goals are to: promote international co-operation and technological renewal with the defence sector; increase the interaction between universities, research organisations, industry and the armed forces; introduce new technologies to the armed forces."

It was recently reported that Israel wants to develop a nanotechnology arsenal.

The *Sydney Herald* and the *Times of India* mentioned tiny sensors that can be scattered on enemy territory; intelligence wasps or mini drones that can squeeze into narrow alleys, jam communications, photograph intelligence targets and even kill militants; anti-suicide bomber sensors that can be installed in public places, that are apparently able to spot a bomber, based on scent, heat and weight; and "bionic man" gloves that would give the user super-human strength.

Nanowerks reported that India is also moving towards military nanoweapons: "Department of Science and Technology (DST), Govt of India will be making use of the Agharkar Research Institute's (ARI) expertise in nanotechnology for the defence establishment. The work, which is to begin soon, will see the ARI providing nanoparticles to the defence establishment."

Nanowerk states: "Proposed and actively pursued military nanotech programs cover a wide range of applications to improve the performance of existing systems and materials and allow new ones. The main areas of research deal with explosives (their chemical composition as well as their containment); bio and medicine (for both injury treatment and performance enhancement); biological and chemical

sensors; electronics for computing and information; power generation and storage; structural materials for ground, air and naval vehicles; coatings; filters; and fabrics." Another application is a portable, cheap, and fast explosive detector.

Nanowerk has identified current and near-term (to 2010) projects that will incorporate nanoparticles. It lists organizations and institutes such as the ISN - Institute for Soldier Nanotechnologies, Naval Research Laboratory - NRL, DARPA - Defense Advanced Research Projects Agency, Army High Performance Computing Research Center, ICB - Institute for Collaborative Biotechnologies and the ARL - Army Research Laboratory. A variety of research projects can be found in the Army RDT&E Budget Item Justification (R2 Exhibit).

The 2005, U.S. Defense Nanotechnology Research and Development Programs reviewed defense nanotechnology research and development programs in the following seven areas:

1. Fundamental Nanoscale Phenomena and Processes
2. Nanomaterials
3. Nanoscale Devices and Systems
4. Instrumentation Research, Metrology, and Standards for Nanotechnology
5. Nanomanufacturing
6. Major Research Facilities and Instrumentation Acquisition
7. Societal Dimensions

Goals related to Societal Dimensions include:

- Assuring health and safety of war fighters utilizing future nanotechnology-based applications
- Enabling physicochemical characterization and toxicology for water, air and space environments
- Sustaining an investment strategy to enable a multidisciplinary education system capable of sustaining the skilled workforce needed to meet future defense needs
- Assessing, avoiding and abating any adverse environmental or health impact from defense utilization of nanotechnology. However the table shows that the societal dimensions is not given a lot of money.

A recent NATO study group outlined numerous issues around the security implications of nanotechnologies, observing: "The potential for NT [nanotechnology] innovations in chemical and biological weapons is particularly disquieting, as NT can considerably enhance the delivery mechanisms of agents or toxic substances. The ability of nanoparticles to penetrate the human body and its cells could make biological and chemical warfare much more feasible, easier to manage and to direct against specific groups or individuals. Dr. Sean Howard, in his work on NT security implications, has even called the threat of chemical and biological warfare a 'real nano goo.' "

Nano-Bio-Info-Cogno are known fields of military products and combat personal interventions. Synbio is just as involved, although less known. The new field of synthetic biology can obviously be misused to design biological and synthetic biology weapons. The U.S. National Science Advisory Board on Biosecurity seems to be getting sidetracked from its original agenda to develop rules to govern the new

field of synthetic biology -- leaving the doors wide open for the negative, uncontrolled diffusion of synthetic biology material and processes towards military applications.

Some believe that the 1972 Biological and Toxin Weapons Convention (BWC) and the 1993 Chemical Weapons Convention covers the synthetic biology field. However the same article states: "Nevertheless, because the BWC has not been signed and ratified by every country, lacks formal verification mechanisms, and does not bind non-state entities such as terrorist organizations, it does little to prevent the deliberate misuse of synthetic biology for hostile purposes."

The synthetic biology crowd is well aware of the biological and security risk. However they prefer self-regulation over local and global government regulations --which is seen by many as not feasible (see my first column).

The start of a nano arms race, and the lack of willingness to regulate potential synthetic biology through the modification of existing treaties or the application of existing treaties or the development of new regulations is short sighted. Nano or synthetic biology weapons will diffuse into hands other than the inventor and first user, and it is easier to reverse engineer nano or synthetic biology military products than to make a nuclear weapon. Once they exist they can be copied, and diffusion of the resulting products will make local and global security nearly impossible. Security would come with a hefty price tag -- not just in financial terms, but in changes to societal interactions. The National Council of Churches, USA has a resolution called General Assembly 2006 of the National Council of Churches USA Presented by the Human Biotechnologies Policy Development Committee Title: Biotechnology and National Security²¹ which is on the right track I think although it does not cover synthetic biology as of yet

NBICS and surveillance(100)

In a recent blog on ID Trail, Angela Long wrote about privacy issues around a planned town in South Korea called New Songdo that is to be operational in 2014. This will be the world's first ubiquitous city or "U-City," in which all major information systems (residential, medical, business, etc.) share data; computers are built into the houses, streets and office buildings; and the technology and facilities infrastructures are integrated. Reading the article one sees the cultural construction of privacy. In North America, privacy is often a big issue, but the need for privacy is not as strong in other cultures.

New Songdo will have no problem filling up with inhabitants. Having read the webpage, I can see why it is enticing for people to move there. And with new technologies on the horizon, the vision behind New Songdo will become even more attractive to others. These capabilities could be implemented quickly in other places, without having to build cities from scratch.

There are new privacy issues, however, that should raise concern. Kris Pister anticipates many applications of a new technology called "smart dust" by 2010, many of which one might see in New Songdo.

Smart Dust was first conceptualized by Kris Pister and Randy H. Katz as an autonomous sensing and communication system working within the confines of a cubic millimeter. Potential applications envisioned by Kris Pister included defense-related sensor networks such as battlefield surveillance, treaty monitoring, transportation monitoring, and scud hunting.

²¹ <http://www.nccusa.org/news/nationalsecurityresolution.html>

Pister also envisaged a virtual keyboard -- "a smart-dust mote stuck to each fingernail," he says, "that could allow finger movements in air to be transmitted to a computer. With this technology, computers could get even smaller, and air guitar would no longer be just a fantasy of rock-star wannabes. If the computer knows where your fingers are: sculpt 3D shapes in virtual clay, play the piano, gesture in sign language and have to computer translate. Combined with a MEMS augmented-reality heads-up display, your entire computer I/O would be invisible to the people around you. Couple that with wireless access and you need never be bored in a meeting again! Surf the web while the boss rambles on and on."

Other possible applications include inventory control, product quality monitoring, smart office spaces, smart body suits (temperature, humidity, and environmental comfort sensors sewn into our clothes), and interfaces for the disabled. Some of the ideas by Wolbring and Golledge could become a reality with sensor networks.

Dana Whicker, presenting to IEEE Women In Engineering of Southern New Jersey, identified applications in structure maintenance, area surveys and surveillance, precision farming, pest control, security and safety, people tracking, the military, environmental protection, energy conservation, and medicine. She sees the possibility of nanoscale motes that will transform the computer environment from one to many through miniaturization.

Smart Dust is applied commercially by Dust Networks, Inc., whose webpage reads "The information you need is all around you. The challenge is to collect and manage it at a reasonable cost. If your OEM application is industrial automation, building automation or defense, then Dust Networks delivers the ideal wireless sensor network featuring >99.9% data reliability, low-power consumption and the ability to collect data from almost anywhere in the physical world." They sell it as a solution for border patrol, perimeter security and battlefield awareness. Wireless micro and nanosensors are an area of intense research.

Honeywell International says it is looking at motes for climate control applications. San Jose, California-based Digital Sun says it is receiving orders for wireless sensors that monitor irrigation. Intel, Crossbow Technologies, Dust Networks, Ember, Millennial Net, Moteiv Corporation, MicroStrain and Philips are also working in this field.

IEEE's 802.15.4 wireless personal area network (WPAN) protocol is an existing standard, also known as ZigBee. "By integrating all the hardware and software functions for creating distributed sensor networks onto a single chip -- called its mote-on-chip -- Dust Networks claims five-fold lower power consumption than Zigbee, the elimination of the need for wired routers, and a 10-fold reduction in the overall price of adding new sensors to an existing network."

According to a Freedonia report, the "US demand for sensors will grow 7.8 percent annually through 2008, driven by sales of more advanced types used in motor vehicles, consumer electronics and information technology. Products such as proximity and positioning sensors, complementary metal-oxide silicon (CMOS) imaging sensors, and MEMS-based speed sensors will lead gains."

The Freedonia study "analyzes the \$9.5 billion US sensors industry and forecasts to 2008 and 2013 by sensor type (e.g., pressure, temperature, flow and level, speed, motion, proximity and positioning, electrical properties, chemicals properties, imaging); and by market (e.g., motor vehicles, industrial, military/aerospace, consumer/household, electronic security, medical, information technology). The study also examines the market environment, details industry structure and market share, and profiles 39 industry competitors including Honeywell, Delphi, Emerson Electric, Motorola, Rockwell Automation, Eaton, Robert Bosch, and Siemens."

On World expects that 126 million sensors could be deployed worldwide by 2010. Industry revenue could total \$8 billion in 2010, up from \$300 million this year. On World has a variety of reports on the issue. Smart dust and wireless networks are of course linked to RFID chips research in which many countries such as Canada and South Korea are investing heavily. Research from analyst house Frost and Sullivan found that revenue from RFID in healthcare and pharmaceuticals will rise almost sixfold, from 2004's total of \$370 million to \$2.3 billion in 2011. Besides RFID chips and smart dust and wireless sensor networks, there is the utility fog aka: polymorphic smart materials, which is smart dust plus movable parts.

There are social concerns with the whole area. Michael Mehta, a sociologist at the University of Saskatchewan (Canada), explored in his paper how the development of nano-scale devices for surveillance, tracking and monitoring may create a society that functions as a 'panopticon' with an institutionalized and physical form of surveillance.

According to Mehta, "Nanotechnology is stimulating significant advances in surveillance and monitoring technology. By facilitating the miniaturization of remote camera technology, the panoptic effects from surveillance become magnified. It will soon become possible to place undetectable video cameras, microphones and transmitters anywhere one wishes. For example, researchers from Hiroshima University and Nippon Hoso Kyokai (NHK) have discovered that silicon nano-crystal film is photoconductive. Once greater control over the size of crystal grains is achieved, it should be possible to use such films in charge-coupled devices for making highly sensitive, compact video cameras."

Mehta makes the interesting point that "as a precondition of trust, privacy is an essential ingredient in a society where 'social capital' is required for stimulating innovation" and that "the wide-scale use of surveillance equipment may create a society with lower levels of trust, less social capital and depressed civic engagement. In short, these uses of nanotechnology could depress innovation."

Mehta is not alone in his concerns. ETC Group quotes the UK Royal Society report on *Nanoscience and Nanotechnologies: Opportunities and Uncertainties*, which also highlighted privacy concerns raised by nanosensors: "...[Sensor] devices might be used in ways that limit individual or group privacy by covert surveillance, by collecting and distributing personal information (such as health or genetic profiles) without adequate consent, and by concentrating information in the hands of those with the resources to develop and control such networks."

In the RFID journal online one finds the following news item: "May 2, 2006 -- Wisconsin's legislative branch cleared a bill late last week that would ban anyone from implanting RFID microchips into people without their consent. The legislation prohibits anyone, including employers or government agencies, from requiring people to have microchips implanted in them. Violators would face fines of up to \$10,000."

There are many who see privacy issues with RFID chips. There are others who do not see problems with the chips, but see smart dust as alarming. On the technoprobe blog one reads, "Will smart dust pose privacy problems? The sensors it can carry mean that it is not capable only of reporting, like an RFID, what product you bought or own. It can take pictures, record sound, sniff for drugs, and more. It can be scattered in a student's dorm room or clothing. It can be embedded in paint. It is actually much more alarming than RFID tags!"

There are growing challenges to privacy and an increase very likely in surveillance. Although may be not obvious this is also an issue for the WCC.

Setting the Stage IV General Impact of NBICS (101;102)

NBICS use, research, and development both embody and shape the perspectives; purposes; prejudices; particular objectives; and cultural, economical, ethical, moral, spiritual, and political frameworks of different social groups and society at large. NBICS not only provides us with new products but it influences and is influenced by how we understand who we are and how we are related to the rest of the world. We see this in a wide range of discourses, areas of action, concepts and trends:

Discourses:

- Human security(103)
- Social Cohesion(104)
- Religion, Faith, Traditional Knowledge, Theology
- Biodiversity
- Inequity
- Ethics
- Law
- Raising the acceptance level for a given technology
- Language
- Self perception and identity (Body politics)
- Interpreting International treaties
- Governance
- Evaluation, measuring, analysis, and outcome tools
- Trade

Areas of Action :

- NBICS for Development
- the UN Millennium Development Goals
- Global medical and social health
- Accessibility
- Law
- Water and Sanitation
- Disaster Management
- Weapons/War
- Ethics/philosophy
- Social science/anthropology
- Community
- Networking

Concepts:

- Self Identity Security
- Ability Security
- Cultural Identity/Diversity
- Morphological Freedom and morphological judgement
- Concept of health and disease
- Concept of disability and impairment

Trends:

- The appearance of enhancement medicine and the acceptance of beyond species-typical functioning
- Moving from curative to enhancement medicine; decrease in curative medicine and the appearance of the transhumanist/enhancement burden of disease
- Moving from human rights to sentient rights
- Moving from morphological freedom to morphological judgement
- The appearance of the techno poor disabled
- Moving from natural commodity to nanoformulated commodity to atomically synthesized commodity
- Moving from investigating life to designing life

Setting the Stage V: Today and the Future: NBICS for Development:

A recent survey (11) concluded that the top 10 nanotechnology applications for development are:

- Energy storage, production and conversion;
- Agricultural productivity enhancement;
- Water treatment and remediation;
- Disease diagnosis and screening;
- Drug delivery systems;
- Food processing and storage;
- Air pollution and remediation;
- Construction;
- Health monitoring;
- Vector and pest detection and control.

However there is more to the issue than nanotechnology to the rescue for the ‘poor’.

Noela Invernizzi and Guillermo Foladori, (see their article in this issue of *Development*) in direct response to the top ten nanotechnologies for development list stated,

“Despite the optimistic assessments recently offered, experience suggests that nanotechnology could follow the mainstream economic trends that increase inequality. First, the development of nanotechnology faces many of the same problems faced by prior technological developments because large multinational corporations are patenting the majority of the nanotechnology products. Patents are monopolistic guarantees of earnings for twenty years – something that certainly works against the rapid diffusion of the beneficial potentials of this technology for the poor.” (105),(106)

The UN Millennium Project’s Task Force on Science, Technology and Innovation identifies nanotechnology as an important tool for addressing poverty an achieving the Millennium Development Goals.(12)

However as ETC Group states in their report “The Potential Impacts of Nano-scale technologies on commodity markets: the implications for commodity dependent developing countries’ written for the South Centre,

“For the majority of developing countries, commodity production is the backbone of the economy. Commodity dependence and poverty are closely intertwined. Commodities provide the primary source of income for the South’s rural poor. Ninety-five out of 141 developing countries depend on commodities for at least 50 per cent of their export earnings; 46 developing countries depend on three or fewer commodities for more than half of their total export earnings.” (106). “Governments, industry and scientists in OECD countries are quick to point out the potential contributions of nano-scale technology to development in the South. To date however, the potential disruptive impacts of nanotech on developing economies and human development have received far less attention. South Africa’s Minister of Science and Technology, Mosibudi Mangena, warned in February 2005” (106) “With the increased investment in nanotechnology research and innovation, most traditional materials...will...be replaced by cheaper, functionally rich and stronger [materials]. It is important to assure that our natural resources do not become redundant, especially because our economy is still very much dependent on them.” (106). “Nanotech’s new designer materials could topple commodity markets, disrupt trade and eliminate jobs. Worker-displacement brought on by commodity obsolescence will hurt the poorest and most vulnerable, particularly those workers in the developing world who don’t have the economic flexibility to respond to sudden demands for new skills or different raw materials. It is also important to note that nano-scale technologies could offer potential for developing countries to innovate and add value to current commodities. In addition, proponents of nanotechnology point to future environmental benefits of revolutionary manufacturing processes associated with “bottom-up” construction that will minimize waste and offer the potential to recycle raw materials.” (106). “The potential impacts of nanotech for the South cannot be categorized as monolithically “good” or “bad.” However, it is clear that commodity dependent developing nations are the poorest, most vulnerable and will likely face the greatest socio-economic disruptions.” (106)

Safety and intellectual property (IP) are other issues in regards to nanomaterial which receive increasingly attention in the public and in the governance of nanotechnology domain.

If the previously highlighted top 10 nanotechnology applications for development (11) are to be of any use it is evident that the processes, productions and research have to happen also in low income countries and not only in high income countries. There are two initiatives which try to find ways to increase innovation and affordable production and products in low income countries. Cambodia (107) developed the Biological Innovation for Open Society (BIOS) to tackle the problem of lack of production and research. (108) They propose a protected commons (109) to modify the patent concept which in their eyes allows for an increase in innovation especially in low income countries.

The World Health Assembly adopted a resolution last May (WHA59.24) creating a working group to develop a global strategy on intellectual property, health research and development, and new medicines for diseases that especially affect developing countries. (110)

The Cambodia approach and the World Health Assembly resolution apply to many nano products and processes. (110)

Setting the Stage VI: Today and the Future: NBICS the WCC and the UN Convention on the rights of persons with disabilities(111):

After five years of negotiations, countries have agreed on a new treaty to protect the rights of persons with disabilities²².

The convention was adopted by the UN General Assembly on December 13, 2006 and open for ratification since March 2007.

So how does this Convention relate to NBICS and the WCC?

“The purpose of the convention is to promote, protect and ensure the full and equal enjoyment of all human rights by persons with disabilities. It covers a number of key areas such as accessibility, personal mobility, health, education, employment, habilitation and rehabilitation, participation in political life, and equality and non-discrimination. The convention marks a shift in thinking about disability from a social welfare concern to a human rights issue, which acknowledges that societal barriers and prejudices are themselves disabling.”

The convention fulfills this goal in many areas especially with strong language in article 4 general obligations, article 8 awareness raising, and article 21 freedom of expression and opinion and access to information. The Convention recognizes the right to education (article 24), right to work (article 27) and the right of persons with disabilities to an adequate standard of living for themselves and their families, including adequate food, clothing and housing, to social protection, to equal access by persons with disabilities to clean water services, (article 28 Adequate standard of living and social protection). It also covers access to justice (article 13), freedom from torture or cruel, inhuman or degrading treatment or punishment (article 15) freedom from exploitation violence and abuse (article 16)

A variety of statements place obligations in relation to the NBICS discourse in terms of access to products and the involvement of disabled people: (Preamble (e), (m) and (r) Article 4-General Obligation (c),(f)(i) (ii) and (g); Article 9- Accessibility Intro and 1 (g) (h); Article 15-Freedom from Torture or cruel, inhuman or degrading treatment or punishment; Article 20- Personal mobility (b) (d); Article 21- Freedom of expression and access to information intro and (a); Article-Health (e); Article 28-Adequate standard of Living and Social Protection (a).

It is evident that every paragraph must have an impact on WCC policies in regards to disabled people.

Setting the Stage VII: Today and the Future: The appearance of NBICS-medicine(112)

Nanomedicine by itself or in convergence with BICS is envisioned by some to have the answer for global problems of disease and ill medical health. Others pursue extreme lifespan extension, if not immortality. Whereas others again argue for the pursuit of ‘morphological freedom’(9) allowing the human body to move beyond species typical functioning.

Some definitions of Nano-(NBICS)- medicine

- medical intervention at the molecular scale for curing disease or repairing damaged tissues, such as bone, muscle, or nerve.(13)
- the study of biotechnology, pharmacy and biosensors at the cellular level.
- the application of nanoscale principles to biomedical technology,
- the comprehensive monitoring, control, construction, repair, defense, and

²² <http://www.un.org/disabilities/convention/index.shtml>

improvement of all human biological systems, working from the molecular level, using engineered nanodevices and nanostructures;

- the science and technology of diagnosing, treating, and preventing disease and traumatic injury, of relieving pain, and of preserving and improving human health, using molecular tools and molecular knowledge of the human body; (113)
- the employment of molecular machine systems to address medical problems, using molecular knowledge to maintain and improve human health at the molecular scale." (113)

The journal *Nanomedicine: Nanotechnology, Biology and Medicine* was launched in March 2005.⁽¹¹⁴⁾ Quite a few Nanomedicine Roadmaps exist by now. (15) (16)

According to Frost and Sullivan, nanotechnological processes in medicine will obtain a sales volume of about \$180 billion until 2015. (115) According to the Freedonia group, (116) "demand for nanotechnology health care products in the US is projected to increase nearly 50 per cent per year to \$6.5 billion in 2009 and by 2020, demand for nanotechnology health care products is projected to exceed \$100 billion." (116)

| US NANOTECHNOLOGY HEALTH CARE PRODUCTS DEMAND (million dollars) | | | | | |
|---|------|------|-------|--|--|
| Item | 2004 | 2009 | 2014 | | |
| Nanotech Health Care Product Demand | 906 | 6500 | 27700 | | |
| Pharmaceuticals | 406 | 3000 | 16600 | | |
| Diagnostics | 465 | 1100 | 2200 | | |
| Medical Supplies & Devices | 35 | 2400 | 8900 | | |

US NANOTECHNOLOGY HEALTH CARE PRODUCT DEMAND TO REACH \$6.5 BILLION IN 2009; (116). According to a 2007 report by Cientifica (117) "The total market for products incorporating nanotechnologies (and including semiconductors and electronics) is estimated to be US\$ 135 billion at the beginning of 2007 rising to US\$ 693 billion by the end 2012 and US\$ 2.95 trillion by 2015. Excluding semiconductors and electronics, the total market for products incorporating nanotechnologies is estimated to be US\$ 83 billion in 2007 rising to US\$ 263 billion by 2012 and US\$ 1.5 trillion by 2015." (117)

However more importantly Cientifica predicts; "The model predicts that some 80% of the 2015 US\$ 1.5 trillion market will be accounted for by applications of nanotechnologies in the pharmaceuticals and healthcare sectors." (117)

A Nanomedicine taxonomy from 2003 (13) and a 2005 published one (14) give an idea as to what is covered by Nano/NBIC medicine nowadays

Nanomedicine Taxonomy

| | |
|--|--|
| <p><u>Biohermaceutics</u></p> <p>Drug Delivery</p> <p style="padding-left: 20px;">Drug Encapsulation</p> <p style="padding-left: 20px;">Functional Drug Carriers</p> <p>Drug Discovery</p> <p><u>Implantable Materials</u></p> <p>Tissue Repair and Replacement</p> <p style="padding-left: 20px;">Implant Coatings</p> <p style="padding-left: 20px;">Tissue Regeneration Scaffolds</p> <p>Structural Implant Materials</p> <p style="padding-left: 20px;">Bone Repair</p> <p style="padding-left: 20px;">Biodegradable Materials</p> <p style="padding-left: 20px;">Smart Materials</p> <p><u>Implantable Devices</u></p> <p>Assessment and Treatment Devices</p> <p style="padding-left: 20px;">Implantable Sensors</p> <p style="padding-left: 20px;">Implantable Medical Devices</p> | <p>Sensory Aids</p> <p style="padding-left: 20px;">Retina Implants</p> <p style="padding-left: 20px;">Cochlear Implants</p> <p><u>Surgical Aids</u></p> <p>Operating Tools</p> <p style="padding-left: 20px;">Smart Instruments</p> <p style="padding-left: 20px;">Surgical Robots</p> <p><u>Diagnostic Tools</u></p> <p>Genetic Testing</p> <p style="padding-left: 20px;">Ultra-sensitive Labeling and Detection Technologies</p> <p style="padding-left: 20px;">High Throughput Arrays and Multiple Analyser</p> <p>Imaging</p> <p style="padding-left: 20px;">Nanoparticle Labels</p> <p style="padding-left: 20px;">Imaging Devices</p> <p><u>Understanding Basic Life Processes</u></p> |
|--|--|

(13)

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Table 1
A partial nanomedicine technologies taxonomy

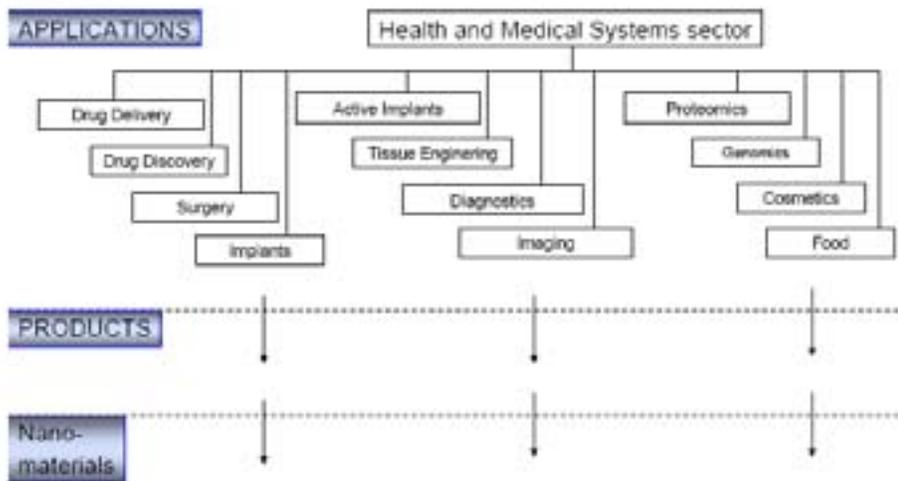
| | | |
|--|---|--|
| <p>Item nanomaterials</p> <p>Nanoparticle coatings</p> <p>Nanocrystalline materials</p> | <p>Cell stimulation and cell diagnostics</p> <p>Cell chips</p> <p>Cell simulators</p> | <p>Biological research</p> <p>Nanobiology</p> <p>Nanoscience in life sciences</p> |
| <p>Nanostructural materials</p> <p>Cyclic peptides</p> <p>Dendrimers</p> <p>Detoxification agents</p> <p>Fulvic acids</p> <p>Functional drug carriers</p> <p>MRI scanning (nanoparticles)</p> <p>Nanobubbles</p> <p>Nanocapsules</p> <p>Nanofibers</p> <p>Nanoparticles</p> <p>Nanoshells</p> <p>Carbon nanotubes</p> <p>Nanowire nanotubes</p> <p>Quantum dots</p> | <p>DNA manipulation, sequencing, diagnostics</p> <p>Capillary testing</p> <p>DNA microarrays</p> <p>Electro DNA sequencing</p> <p>DNA manipulation and control</p> | <p>Drug delivery</p> <p>Drug discovery</p> <p>Biopharmaceutics</p> <p>Drug delivery</p> <p>Drug encapsulation</p> <p>Smart drugs</p> |
| <p>Artificial binding sites</p> <p>Artificial antibodies</p> <p>Artificial enzymes</p> <p>Artificial receptors</p> <p>Molecularly imprinted polymers</p> | <p>Tools and diagnostics</p> <p>Bacterial detection systems</p> <p>Biochips</p> <p>Biomolecular imaging</p> <p>Biosensors and biodetection</p> <p>Diagnostic and delivery applications</p> <p>Endoscopic robots and microscopes</p> <p>Fluorescence-based sensors</p> <p>Imaging (cellular, etc.)</p> <p>Lab on a chip</p> <p>Monitoring</p> <p>Nanosurgery</p> <p>Point of care diagnostics</p> <p>Protein microarrays</p> <p>Scanning probe microscopy</p> | <p>Molecular medicine</p> <p>Gene therapy</p> <p>Pharmacogenomics</p> |
| <p>Control of surfaces</p> <p>Artificial surfaces—adhesive</p> <p>Artificial surfaces—nonadhesive</p> <p>Artificial surfaces—regulated</p> <p>Biocompatible surfaces</p> <p>Biofilm suppression</p> <p>Engineered surfaces</p> <p>Patterned surfaces (contact guidance)</p> <p>Thin-film coatings</p> | <p>Intracellular devices</p> <p>Intracellular array</p> <p>Intracellular biocomputers</p> <p>Intracellular sensors/reporters</p> <p>Implants inside cells</p> | <p>Artificial enzymes and enzyme control</p> <p>Enzyme manipulation and control</p> |
| <p>Nanopores</p> <p>Immunoconjugation</p> <p>Molecular sieves and channels</p> <p>Nanofiltration membranes</p> <p>Nanopores</p> <p>Separations</p> | <p>BioMEMS</p> <p>Implantable materials and devices</p> <p>Implanted bioMEMS, chips, and electrodes</p> <p>MEMS/Nanomaterials-based prosthetics</p> <p>Spintronic aids (artificial retina, etc.)</p> <p>Microarray</p> <p>Microfluidic/ser-based sensors</p> <p>Microfluidics</p> <p>Microspheres</p> <p>Medical MEMS</p> <p>MEMS surgical devices</p> | <p>Nanotherapeutics</p> <p>Antibacterial and antiviral nanoparticles</p> <p>Fluorescence-based pharmaceuticals</p> <p>Photodynamic therapy</p> <p>Radio pharmaceuticals</p> |
| | | <p>Synthetic biology and early nanomedicine</p> <p>Dynamic nanoplatform, “nanosense”</p> <p>Taxo-dendrimers</p> <p>Artificial cells and liposomes</p> <p>Polymeric micelles and polymersomes</p> |
| | | <p>Biotechnology and biosensors</p> <p>Biologic viral therapy</p> <p>Virus-based hybrids</p> <p>Stem cells and cloning</p> <p>Tissue engineering</p> <p>Artificial organs</p> <p>Nanobioelectronics</p> <p>Biosensors and biosets</p> |
| | | <p>Nanorobotics</p> <p>DNA-based devices and nanorobots</p> <p>Diamond-based nanorobots</p> <p>Cell repair devices</p> |

(14)

A nanoroadmap for Nanomedicine in Europe(115) has the following taxonomy



SWOT Health and Medical Systems Sector



23

Many Nanomedicine products envisioned or anticipated can be found in a recent report by Wolbring(18) and others(5; 15; 16; 118; 119)

Many NBICS products in general and NBICS-medicine products in particular are appearing (13; 17; 17; 115; 116; 120-132; 132-160). Many NBICS-'health products are envisioned for disabled people and others (7; 161-165). Some NBICS advances are in the area of Brain-machine interfaces (77-91) (166); bionic implants(167-170); bionic ear(128; 171-174); bionic eyes(175-179); next generation autonomous wheelchair control(180); bionic legs and arms (181-188); bionic knee (189-191); neural prostheses(192); spinal cord prostheses (193-195); speech(196; 197); cranial, neural, and other implants(198; 199); artificial joints,(200) artificial muscles,(201) artificial nose and tongues, nose on a chip,(202; 203), artificial kidney,(204) artificial liver,(205) artificial lungs,(206) artificial discs,(207).

All of the envisioned NBICS medicine products as well as the Cientifica prediction will have to be evaluated by the WCC for their global impact

Setting the Stage VIII: A secular view of health, disease and disability/impairment

Species typical functioning versus subnormal species typical functioning

Numerous concepts, models, determinants of, and relationship among health, disease, wellbeing, and 'disability' existed throughout history. The same is true for the usage of the term 'disability'.

²³ <http://www.nanoroad.net/index.php?topic=download;>
http://www.nanoroad.net/download/roadmap_mh.pdf

An interrelationship exist between direction in and governance of science and technology and the concepts of health, disease, wellbeing and 'disability' and impairment. On the one hand technologies such as NBICS impact on the very concept of health, disease wellbeing and 'disability'. On the other hand, concepts of health, disease, wellbeing and 'disability' impact on the direction and governance of research and development of NBICS.

Relationship between health and wellbeing:(50)

Two contradictory models exist concerning the relationship between "health" and "wellbeing". The World Health Organization (WHO) model considers different domains of well-being as determinants of the umbrella term "health" which is reflected in the WHO definition of health, wherein health is defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (208). This model through different wellbeing determinants combined the areas of "medical health" and "social health" under the term "health".

However increasingly societies and policies move away from the WHO definition of health treating wellbeing less and less as a determinant of health(209-211) but interpreting the term "health" to mean "medical health"/ "medical illness". "Health" is used today mostly to cover the domain of "medical" determinants of "wellbeing." "Social health" is not covered anymore under the term "health."

Determinants and models of health and disease (50)

Medical model of health and disease

Within the **medical model of health and disease**, health is limited to cover "medical health" and is characterized as the **normative functioning** of biological systems whereas disease/ illness is defined as the **sub-normative functioning** of biological systems.

Locating the cause of and solution for "ill medical health" comes in two flavors.

Medical determinants of medical health place the cause of **sub-normative functioning** within the individual's biological system leading to medical interventions towards the species typical norm on the level of the individuals (medical, individualistic cures).(49;50;212)

Social determinants of medical health identify external factors as the cause of the "ill medical health" the **sub-normative functioning** of the individual. This includes, for example, contaminated water that leads to bacterial or parasitic infections, or job insecurity that contributes to stress and heart disease. (50)

This version of the medical model is often misleadingly referred to as the "social model of health" or as the "social determinants of health". It is misleading because the model addresses social factors contributing only to "ill medical health"/"medical illness". The "social determinants" relating to the social wellbeing the "social health" of a person are not addressed at all. (50)

Social model of health(50)

A real social model of health using social determinants of health would examine how social determinants influence "physical, mental, and social wellbeing" and would not be limited to look at how social determinants influence and worsen "medical health". One does not have to be identified

as a "patient" or "patient to be", as a person in "ill medical health" or in danger of gaining ill/bad medical health in order to be covered and investigated under the social model of health.

| Models (identity) and determinants (interventions) of Health | |
|--|---|
| If one deals with models and determinants of health one in the end deals with two issues. The models of health define the client (animal human) and the cause whereby the determinants define the intervention | |
| Medical model (identity, bodily reality part) of a person | <p>The person's bodily reality is viewed as defective directly caused by disease, trauma or other 'medical health conditions' leading to a body structure, function that deviates from certain norms. The person obtains the identity label of being an impaired person/person with an impairment, a 'patient' with ill medical health, with subnormative functioning. (I8)</p> <p>Within the medical model of health, health is limited to cover "medical health" and is characterized as the normative functioning of biological systems (e.g. in humans or animals) whereas disease/ illness is defined as the sub-normative functioning of biological systems. It excludes interventions in regards to social and spiritual well being which can not directly be linked to a medical problem. (I8) The 'patient is the target of its intervention whether through cure or the prevention of the appearance.</p> |
| <ul style="list-style-type: none"> • Medical determinants of medical health of a patient | <p>place the cause of sub-normative functioning within the individual patient's biological system leading to medical interventions towards the species typical norm on the level of the individual focusing on medical cure, medical individualistic care and individualistic normative rehabilitation as the primary endpoint and at the political level the principal response is to make curative medicine more efficient(I8)</p> |
| <ul style="list-style-type: none"> • Social determinants/ interventions of medical health of a patient | <p>identify external factors as the cause for the "ill medical health" the sub-normative functioning of the individual, the patient and tries to fix the external factors to prevent medical ill health. This includes, for example, the elimination of contaminated water that leads to bacterial or parasitic infections, or job insecurity that contributes to stress and heart disease. (I8) It also includes prevention of an impaired person through prevention at birth, deselection on the embryo and fetus level, and preventative measures such as vitamins. At the political level the principal response is to make preventive medicine more efficient(I8)</p> |
| <ul style="list-style-type: none"> • Social determinants/ social well-being intervention of a patient | <p>Although some social determinants interventions such as decreasing job insecurity also increase social well being, the performance indicator is a positive change in a medical parameter.</p> <p>Improve the social well-being of the patient through social determinant interventions(I8)</p> |
| Social Health(I8) | social determinants intervention towards the social well being of a person not labeled as being in ill medical health or in danger of being medical ill (I8) |

(213)

Models of disability and disabled people (50)

If one reads the literature the terms disabled, impaired, disability, disabled people are rather inconsistent. I outline in the below table the different possibilities.

| Disability | |
|--|---|
| Medical model of Disability | People disabled by their impairment (sub-species typical functioning) |
| Social model of disability | People disabled by the attitudinal and environmental barriers that person faces due to his/her body structure/function that hinder his/her full and effective participation in society on an equal basis with others, |
| Transhumanist model of disability | People disabled by their impairment (species typical functioning). |
| Social model of disability, medical model of the person; impaired disabled person (UN Convention on the rights of persons with Disabilities) | disability results from the interaction between persons with impairments (sub-species typical functioning) and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others, |
| Social model of disability, medical model of the person; impaired disabled person (ICF) | the outcome or result of a complex relationship between an individual's health condition and personal factors, and of the external factors that represent the circumstances in which the individual lives |
| Social model of disability, neutral model of the person | results from the interaction between a person with a given body structure/function and attitudinal and environmental barriers that person faces due to his/her body structure/function that hinder his/her full and effective participation in society on an equal basis with others, |
| Social model of disability, social model of the person; vari-abled disabled person | results from the interaction between a person with a variation in body structure/function and attitudinal and environmental barriers that person faces due to his/her variation in body structure/function that hinder his/her full and effective participation in society on an equal basis with others, |
| Social model of disability, transhumanist model of the person; transhuman impaired person | disability results from the interaction between persons with impairments (species typical functioning) and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others, |

| The person | |
|----------------------------|---|
| Disabled | A consequence of the body structure/function related disability one encounters |
| Disabled person | Everyone one who encounters body structure/function related attitudinal and environmental barriers that hinder one's full and effective participation in society on an equal basis with others, |
| Person with a Disability | Everyone one who encounters body structure/function related attitudinal and environmental barriers that hinder one's full and effective participation in society on an equal basis with others, |
| Impaired person | Everyone who identifies oneself as having subnormative bodily functioning based on a species-typical norm. |
| Vari-abled person | Everyone who identifies oneself as having a vari-ability in bodily functioning which differs from the species-typical norm. However one should keep in mind that often people are identified by others as impaired even if the person does not identify as such. |
| Vari-abled disabled person | Everyone who identifies oneself as having a vari-ability in bodily functioning which differs from the species typical norm and who encounters body structure/function related, ableism related attitudinal and environmental barriers that hinder one's full and effective participation in society on an equal basis with others. . However one should keep in mind that often people are identified by others as impaired even if the person does not identify as such. |
| Impaired disabled person | Everyone who identifies oneself as having subnormative bodily functioning based on a species typical norm and who encounters body structure/function related, ableism related attitudinal and environmental barriers that hinder one's full and effective participation in society on an equal basis with others. |

Moving from Species-typical functioning to Beyond species-typical functioning

Advances in and converging of NBICS allows for a new model of health which takes into account the increased ability of science and technology products to modify the appearance of the body and

| | |
|--|--|
| | |
|--|--|

it's functioning of humans and other species (214) beyond existing norms and species-typical boundaries.

The new kid on the block: the transhumanist/enhancement model of health(50)

Within the **transhumanist/enhancement model of health**, the concept of health no longer has the endpoint that someone is "healthy" if the biological systems function within species-typical, normative frameworks. Within the transhumanist/enhancement model all Homo sapiens bodies (and in the end all bodies of all species) – no matter how conventionally "medically healthy" – are defined as limited and defective in need of constant improvement made possible by new technologies appearing on the horizon (a little bit like the constant software upgrades we do on our computers). Health in this model is the concept of having obtained maximum (at any given time) enhancement (improvement) of one's abilities, functioning and body structure. Disease, in this case, is identified in accordance with a negative self-perception and non-enhanced body (i.e., "I feel un-well because I feel confined to the normal human body and I want to add capabilities to the body as soon as it is possible"). It also links social wellbeing and "social health" to the availability of enhancement procedures.

| | |
|--|--|
| <p>Transhumanized health</p> <ul style="list-style-type: none"> • Transhumanized intervention <ul style="list-style-type: none"> ○ Transhumanized medical determinant interventions ○ Transhumanized social determinant interventions ○ Transhumanized social determinant/social well being interventions | <p>all Homo sapiens bodies – no matter how conventionally “medically healthy” – are defined as limited and defective as in ill health in need of constant improvement made possible by new technologies appearing on the horizon (a little bit like the constant software upgrades we do on our computers). Health in this model is the concept of having obtained maximum (at any given time) enhancement (improvement) of one’s abilities, functioning and body structure. (18)</p> <p>These interventions see enhancement beyond species-typical body structures and functioning as a therapeutic intervention (transhumanization of medicalization)(18). They can happen on three levels a) external by shaping the environment (transhumanized social determinants), b) internal reversal by modifying bodily structures in an reversible fashion (transhumanized medical determinant) and c) internal non-reversal by modifying bodily structures in a non-reversible fashion (transhumanized medical determinant)</p> <p>Enhancement medicine is the new field providing the remedy and maintenance through surgery, pharmaceuticals, implants and other intervention on the level of the body. The transhumanist model of interventions views science and technology as having the potential to free everyone – the now "all impaired people" from the "confinement of their genes" (genomic freedom) and the "confinement of their biological bodies" (morphological freedom). (18;215)</p> <p>Transhuman public health is the new field which will ensure that social determinant barriers to transhuman interventions are eliminated. It is also the field which would try to enable bodily enhancements mediated through changing the environment</p> <p>Improve the social well-being of the patient waiting to be transhumanized through social determinant interventions(18)</p> |
|--|--|

| | |
|---|---|
| Transhumanist model of disability | People disabled by their impairment (species typical functioning). |
| Social model of disability, transhumanist model of the person; transhuman impaired person | disability results from the interaction between persons with impairments (species typical functioning) and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others, |
| Transhumanized impaired person (techno poor impaired person) | Everyone who identifies oneself as being deficient because one is not able to improve oneself beyond Homo sapiens normative functioning whether through a) external means by shaping the environment, or b) internal means by modifying ones bodily structures. |
| Transhumanized disabled person | Everyone who is not enhanced beyond Homo sapiens normative functioning whether through a) external means by shaping the environment, or b) internal means by modifying ones bodily structures which makes the person to encounters ableism related attitudinal and environmental barriers mostly justified by a transhumanized version of ableism that hinder one's full and effective participation in society on an equal basis with others. However one should keep in mind that often people are identified by others as impaired even if the person does not identify as such. |
| Transhumanized impaired disabled person (techno poor impaired disabled person) | Everyone who identifies oneself as being deficient because one is not able to improve oneself beyond Homo sapiens normative functioning whether through a) external means by shaping the environment, or b) internal means by modifying ones bodily structures and who encounters attitudinal and environmental barriers mostly justified by a transhumanized version of ableism that hinder one's full and effective participation in society on an equal basis with others, |
| Transhumanized vari-abled person | Everyone who identifies oneself as having a beyond species-typical functioning variability in bodily functioning which differs from the species typical norm. This could be employed by a) external means by shaping the environment, or b) internal means by modifying ones bodily structures However one should keep in mind that often people are identified by others as impaired even if the person does not identify as such. |

(213)

The new kid on the block: the transhumanist/enhancement model of disability, impairment and disabled people (50)

(213)

(213)

| | |
|---|--|
| Transhumanized vari-abled disabled person | Everyone who identifies oneself as having a beyond species-typical functioning variability in bodily functioning which differs from the species typical norm which was achieved through a) external means by shaping the environment, or b) internal means by modifying ones bodily structures and who therefore encounters attitudinal and environmental barriers mostly justified by an Anti-transhumanized version of ableism that hinder one's full and effective participation in society on an equal basis with others. |
|---|--|

Who is a non-impaired person?

Up until now a non-impaired person is considered to be someone whose body functioning performs within species-typical, acceptable parameters. They are medically healthy. However this is changing.

Within the transhumanist/enhancement model of health, a person is no longer considered to be healthy non-impaired if his/her biological systems function within species-typical, normative frameworks. Rather, in this model all Homo sapiens bodies – no matter how conventionally “medically healthy” – are defined as limited and defective as impaired. They are seen to be in need of constant improvements that are made possible by new technologies appearing on the horizon (rather like the constant software upgrades we do on our computers). Health in this model is the concept of having obtained maximum (at any given time) enhancement (improvement) of one's abilities, functioning and body structure. Disease, in this case, is identified in accordance with a negative self-perception of ones non-enhanced body (i.e., “I feel un-well because I feel confined to the normal human body and I want to add capabilities to the

body as soon as it is possible”). It also links social wellbeing and social health to enhancement procedures being accessible.

So who is an impaired person in this enhancement model of health?

Because, in the transhumanist model of health, every Homo sapiens body is seen as being in need of improvement (above species-typical boundaries), everyone is, by definition, impaired. Within this model impaired people are those who are not improved themselves beyond Homo sapiens normative functioning. This model results in a new group in society – the techno poor disabled.

In this model, technologies which add new abilities to the human body are seen as the remedy for poor medical/transhumanist health. Enhancement medicine is the new field providing the remedy through surgery, pharmaceuticals, implants and other means.

The transhumanist model of disability views science and technology – including NBICS – as having the potential to free everyone – all of whom now belong to the group ‘disabled people’ - from the confinement of their genes (genomic freedom) and the confinement of their biological bodies (morphological freedom). It fits well with the existing dynamic of the medicalization of the human body where more and more variations of human body structure and functioning are labeled as deviations and/or diseases and with the phenomenon that more and more healthy people feel ‘unhealthy, feel badly about their bodily structure and functioning’.

The transhumanist/enhancement model elevates the medicalization dynamic to its ultimate endpoint, namely, to see the enhancement beyond species-typical body structures and functioning as a therapeutic intervention. This can be called the transhumanization of medicalization(18).

The Action:

Advances in sciences and technology and the new transhumanist/enhancement model of health, disease, disability, impairment and well-being as it relates to health and health care increased the ability, demand for, and acceptance of improving and modifying the human body (structure, function, capabilities) beyond its species-typical boundaries. An increasing number of people, believed that we can, will, and should try to overcome our biological limitations and that the move toward the enhancement of the Homo sapiens body of which there are many different types (Table) is not preventable. (7; 66; 214; 216-224)

| Type of Enhancement | Description |
|---|--|
| Somatic genetic enhancement | Genetic alteration of genetic material of human cells or tissue other than reproductive cells. Thus the new genetic makeup are not to be passed onto subsequent generations (so far it is less clear whether such a passing on can be prevented meaning that one can not ensure that germ line cells are not impacted at the same time). |
| Germline genetic enhancement | Genetic alteration of reproductive cells (sperm and egg) of humans in such a way that the introduced genetic material is incorporated into the host genome and passed onto subsequent generations |
| Enhancement for medical reasons/Therapeutic | Genetic or non-genetic enhancement of human |

| | |
|--|--|
| enhancement | characteristics, functions, and abilities performed with the intent of alleviating suffering by disease |
| Enhancement for social reasons/Non-therapeutic enhancement | Genetic or non-genetic enhancement of human characteristics, functions, and abilities not performed with the intent of alleviating suffering by disease (as the report will show this definition is very interpretable related to the definition of disease and suffering) |
| Positional enhancement | Genetic (and non-genetic) enhancement aimed at the obtainment of goods that are desirable only in so far as they provide a competitive advantage(225) |
| Intrinsically good enhancement | Enhancement that adds functions and abilities to the human body that are seen as good |
| Body structure enhancement | Enhancement of body structures without changes in body functions |
| Body function enhancement | Enhancement of body structures leading to changes in body function |
| Neuro structure and function enhancement | Enhancement of neuro structures leading to changes in cognitive functions |
| Ex ante enhancement(226) | Enhancement done before the child is born |
| Ex post enhancement(226) | Enhancement done after birth |

Many arguments were put forward over time for and against enhancement technology (50) It is beyond the scope of this paper to evaluate every argument raised in the enhancement discourse. However, it is of particular interest in regards to enhancement medicine to look at which behaviour and thought patterns evident today make it untenable to draw a line between therapy and enhancement in general and between therapeutic and non-therapeutic enhancements in particular. (227)

1) The Medicalization of the human body

The very meaning of health and disease is highly contested. More and more variations of human body structure and functioning are labeled as deviations as diseases (dynamic of medicalization). A growing number of medical technologies are employed to improve the looks, performance, and psychological well-being of people who are healthy. The traditional form of medicalization artificially assigns a subnormal label toward normal variations of human characteristics. More and more variations of normal characteristics of the human body are labeled as defective and in need of fixing. An editorial in the *British Medical Journal*, (228) which rephrased an editorial of Amartya Sen in the same issue, (229) stated:

"Amartya Sen, an even more distinguished economist, discusses the paradox that people in America feel much less well than those in Bihar, India, though their life expectancy is much better." (p. 860)

In an issue of the Seattle times from 2005 one reads:

"The number of people with at least one of four major medical conditions has increased dramatically in the past decade because of changes in the definitions of disease. "The new definitions ultimately label 75 percent of the adult U.S. population as diseased," according to calculations by two Dartmouth Medical School researchers." (135)

2) The Transhumanization of Medicalization

The transhumanist model of health and disease defines the human body in general as defective, or as a work in progress, elevating the medicalization dynamic to its ultimate endpoint, namely, to see the enhancement beyond species-typical body structures and functioning as a therapeutic intervention (transhumanization of medicalization). The transhumanization of medicalization moves the dynamic of medicalization to its logical conclusion by adding the enhancement of body appearance and functioning above species-typical norms and boundaries to the mix.

3) Many therapies have enhancement aspects. Many enhancements can be classified as therapies and many therapeutic interventions can and are/were used later on for non-therapeutic purposes.

Example of enhancements that could be seen as therapies and therapies that have enhancement aspects

If one gives a gene to a person that makes this person immune to acquired immunodeficiency syndrome (AIDS), this would be a therapy, but it would also be an enhancement of the genetic makeup of the person.

If one implants electrodes into the skull of a person that allows the person to have thought control over their environment (see chapter 7, "Brain Machine Interfaces"), it could be seen as a therapy for a person with cerebral palsy, as that person would be able to compensate for "subnormative" mobility capabilities. However, that person would also be enhanced because humans normally do not have thought control over their environment.

Bionic legs, arms, skins, organs, and other modifications, listed in chapter 7, "NBICS Products Envisioned for Disabled People" in this report, have not only therapeutic but also enhancement potential. The bionic leg pictured in that section makes that leg more capable in certain ways than "normal" biological legs, through, for example, its high-tech knees, which make recipients of these legs jump higher than the "normal leg people." The same scenario could be envisioned for other implants. If a bionic eye ever works well enough to be therapeutic in restoring "normal" vision, then there should be no reason that this device could not enhance vision beyond the biological norm. The Cyborg 2.0 experiments of Warwick already use implants to enhance/add new capabilities to the human body, adding a whole new sense to the human experience, namely, the ability to read radio signals and to react to them. (230;231)

Anti-aging interventions are another area defined by some people as "therapeutic enhancement." If we could gain an extra decade by strengthening our immune system or our antioxidation and cellular repair mechanisms, this would clearly be a human enhancement. But it would also be a preventive therapy, because it would delay cardiovascular disease, senile dementia, cancer, and other illnesses of aging, which we spend billions trying to treat.(232)

This list of modifications with enhancement and therapeutic potential could be extended with no end in sight.

Setting the stage IX: Science and technology, disabled people, and transhumanism(50)

The transhumanist model/transhumanist determinant combination is seen by an increasing number of disabled people as a valid solution for two reasons. One reason is that the medical model views disabled people as deficient in relation to non-disabled people, which is hard for many disabled people to swallow. Another reason is that many disabled people do not feel that society will ever accept them for who they are and will never provide the "social cures" needed. In their eyes, the transhumanist model allows disabled people to seek out transhumanist solutions without feeling inferior to so-called non-disabled people and without having to wait for social cures. Alan Pottinger started the first advocacy group for disabled transhumanists, the Ascender Alliance (UK) in 2001.

John Hockenberry, a paraplegic journalist, states in *Wired* magazine(233):

We live at a time when the disabled are on the leading edge of a broader societal trend toward the use of assistive technology. With the advent of miniature wireless tech, electronic gadgets have stepped up their invasion of the body, and our concept of what it means and even looks like to be human is wide open to debate. Humanity's specs are back on the drawing board, thanks to some unlikely designers, and the disabled have a serious advantage in this conversation. They've been using technology in collaborative, intimate ways for years – to move, to communicate, to interact with the world.

He goes on to describe in many examples how disabled people are pushing the boundary of the human body and what it means to be human. Disabled proponents of medical “therapeutic” fixes are not just proponents of the medical model/medical determinant combo, but, because of our future inability to distinguish between therapies toward a norm and therapies that outdo a norm (brain machine interfaces and artificial legs are just two examples), are also inadvertent proponents of a transhumanist model/transhumanist determination combo, even if they do not actively promote such a model.

Many people see “disabled/impaired” people as a natural fit for transhumanism and as paving the way for transhumanist philosophies and developments. On the website of the World Transhumanist Association, one reads:

Disabled people using the latest assistive technologies with their eyes fixed on medical progress are a natural constituency for transhumanism(234)....Disabled people in the wealthier industrialized countries, with their wheelchairs, prosthetic limbs, novel computing interfaces and portable computing, are the most technologically dependent humans ever known, and are aggressive in their insistence on their rights to be technologically assisted in fully participating in society. James Hughes, the executive director of the World Transhumanist Association, states: The healthy and able-bodied systematically underestimate the quality of life of the technology-dependent disabled. The able-bodied blithely say such things as, “Oh, I’d never want to live hooked up to a machine like that,” only to discover that life is still pretty sweet in a wheelchair or with a breathing machine. Transhumanism, on the other hand, argues that we can and should all live better lives in the future through technological enhancement. Although few disabled people and transhumanists realize it yet, we are allies in fighting for technological empowerment.(235)

According to George Dvorsky, a leading non-disabled transhumanist(236):

No, this particular prosthetic barely resembled a human arm, looking more like something out of a [Terminator](#) movie. It was robotic, sleek and very high tech. In fact, I think I was jealous. Compared to a natural human arm, however, it did lack in functionality and grace. Still, just looking at it made me realize that it won't be long before future prostheses, for all intents and purposes, will be better than my biological appendages. And what's more, the disabled will in all likelihood be encouraged to try out the latest models, to experiment with the latest in prosthetic neural interfacing and advanced cybernetics. Those in the handicapped community tend to be more willing to accept people in various forms and to be more open in their ideas about what it means to be “normal,” or even human. And as the disabled are discovering, when it comes to prostheses and other assistive devices, the sky's the limit; they no longer feel compelled to mimic the human form. For the handicapped, the impetus toward “human normalization” is as irrelevant and useless a notion as it is offensive. Indeed, the disabled are no longer accepting the limitations of the “normal” human body. They are truly bridging the gap between the biological and the mechanical, the human and the [posthuman](#).

Dvorsky quotes Alan Pottinger, the founder of [Ascender Alliance](#), who is an outspoken disability activist:

“Pottinger advocates for the removal of political, cultural, biological and psychological limits to self-realization and augmentation.”(236) “Humanity,” states Pottinger “has always adapted the environment to suits its needs.” The [cyborg](#) transformation of human society is already underway, he argues, and is one of the driving factors in the creation of a posthuman society. Pottinger

concedes, however, that the path taken to posthumanity will be markedly different for the disabled. "Within the able-bodied world there is little variation from person to person, at least in terms of physical form," he says, but "within the disabled community there are a huge number of variations." This variation, argues Pottinger, means that the disabled "agenda will differ from that of the able-bodied as our augmentation will require different procedures." Furthermore, the disabled are openly acknowledging that human normalization is not on the agenda. "Is walking ability that important?" asks Pottinger. In the past perhaps, but Pottinger believes humanity has reached a point in its development where physical capability has begun to be overtaken by mental agility. "Machines," says Pottinger, "which take their orders in the form of simple physical inputs, now control most of our production processes, while in other cases other machines build the machines themselves." Human input is slowly dropping off, he notes, so much that disabled people might be right in arguing that physical ability is not as vital as society makes it out to be. "The development of a computer-orientated society is well underway, if not already complete," contends Pottinger, "and it is something that has brought major benefits to both the disabled and able-bodied community." (236)

Dvorsky goes on to say,

Interestingly, many in the disabled community will choose to be willing test subjects; many have nothing to lose and are eager to try out the latest innovations – if not for themselves, certainly for those in the disabled community who will follow after them.(236)

And as the disabled courageously experiment with their bodies and strive to overcome the injustices and indignities of their disabilities, they will subsequently reinvent themselves for the future. They will be undaunted and unfazed by their departure from human morphology and functionality, while the rest of humanity will watch and take inspiration. And then play catch-up.(236)

However, the match between transhumanist and disabled people might not be quite the glove-on-hand fit as the preceding quotes indicate.

It is understandable that disability groups and individuals who follow the patient/medical model/social determinant/social well being type and the social model/social health/social determinant/social well-being type have problems with the scope of transhumanism, which is not just about enhancing oneself,(237) but also about enhancing one's children (born or to be born) and preventing the birth of humans if they test unfavourably in the prebirth state. From the World Transhumanist Association FAQ page:

Transhumanists uphold the principles of bodily autonomy and procreative liberty. Parents must be allowed to choose for themselves whether to reproduce, how to reproduce, and what technological methods they use in their reproduction. The use of genetic medicine or embryonic screening to increase the probability of a healthy, happy, and multiply talented child is a responsible and justifiable application of parental reproductive freedom.(238)

Beyond this, one can argue that parents have a moral responsibility to make use of these methods, assuming they are safe and effective. Just as it would be wrong for parents to fail in their duty to procure the best available medical care for their sick child, it would be wrong not to take reasonable precautions to ensure that a child-to-be will be as healthy as possible.(238)

This defense of procreative liberty is compatible with the view that states and charities can subsidize public health, prenatal care, genetic counseling, contraception, abortion, and genetic therapies so that parents can make free and informed reproductive decisions that result in fewer disabilities in the next generation. Some disability activists would call these policies eugenic, but society may have a legitimate interest in whether children are born healthy or disabled, leading it to subsidize the birth of healthy children, without actually outlawing or imposing particular genetic modifications.(238)

The resolutions of the bioethics workshops at the 6th World Assembly of Disabled People International (DPI) 2002 stated under the theme of bioethics and the topic of genetics and discrimination”:

I. We demand the right to be different

II. We believe that no parent has the right to design and select their unborn child to be according to their own desires and no parent has the right to design their born child according to their own desires.

III. We defend and demand a concept of “person” that is not linked to a certain set of abilities.(180)

The Disabled People International (DPI) Solihull declaration states, among other things:

- We demand an end to the bio-medical elimination of diversity, to gene selection based on market forces and to the setting of norms and standards by non-disabled people.
- “Biotechnological change must not be an excuse for control or manipulation of the human condition or bio-diversity.
- An absolute prohibition on compulsory genetic testing and the pressurizing of women to eliminate – at any stage in the reproductive process – unborn children who, it is considered, may become disabled.
- That disabled people have assistance to live – not assistance to die.
- That having a disabled child is not a special legal consideration for abortion.
- That no demarcation lines are drawn regarding severity or types of impairment. This creates hierarchies and leads to increased discrimination of disabled people generally.(181)

The Ascender Alliance also might not quite fit the transhumanist agenda if one reads their manifesto:

Technology exists now, and in the future, to enable us to achieve one hundred percent of our potential and even beyond.(239)...We have as much right to see the future; we have equal rights to plan our future. Our lives are as valuable as everyone else’s. We may have limitations; some of us have overcome them, and others have not. But that does not mean that we should be terminated, bred out and institutionalized. At the same time it is our right to remain as we are, we should not have to change to suit anyone but ourselves. We understand why some DMP (disabled member of the public) are satisfied the way they are and respect their wishes; we support no program of forced normalcy but expect other DMP to understand and respect our wishes.

Ascenders do not advocate any program that “cuts out” any proportion of humanity, as would be the case with eugenics and other selective breeding programs. An Ascender needs only the will to improve themselves....An Ascender realizes the potential power of genetic engineering; but we feel that small genetic elite should not control society or dictate the future course of the species. We seek to improve life for all of humanity. Ascenders do not subscribe to the belief that what we believe to be the best course for society will be approved by future generations, hence the desire to limit the amount of irreversible genetic intervention. Moreover, no being should be forced to have superior physical and mental attributes; the right to self-determination begins even before conception. There is only one condition under which pre-natal manipulation is expectable; when it is necessary to repair life-threatening mental and physical deficiencies.(240)

We do not want a world where disabled people “suffer” but it is time for the world at large to realize that a disability does not mean we have a lesser quality of life; disabled people have the same right to life as everyone else and the same rights to use new and emerging technologies to negate their disabilities if they see fit to do so. If we are to end disability, both in terms of the medical effect it has on those who have said disabilities and the way in which society hampers disabled people, it has to be on our terms and not by shedding the blood of innocent men and women.(241)

The preceding quotes contain a few key demands by the Ascender Alliance regarding the use and development of science and technology:

- (1) The right for self-determination, which is interpreted to be extended to the prebirth stage and the future generation.
- (2) The prohibition of negative eugenics through, for example, prenatal deselection.
- (3) The prohibition of germ-line genetic intervention.
- (4) The prohibition of somatic genetic and non-genetic intervention of children and fetuses.
- (5) As it may be impossible to ensure that somatic manipulations will be confined to somatic cells and will not affect germ-line reproductive cells, points 1 and 3 might also mean the prohibition of somatic genetic intervention of adults.
- (6) The prohibition of non-genetic interventions of children and fetuses.
- (7) The acceptance of the right of adults to modify themselves through somatic genetic (maybe) and non-genetic interventions.

The general message of the Ascender Alliance Manifest is twofold:

- (1) No one has the right to judge biological realities/characteristics of others independent of the stage of human development available for judging and prevent or change them based on that judgment; and
- (2) Everyone has the right to change themselves as long as these changed abilities are available for everyone and are not transmitted to the next generation.

Setting the Stage X: The politics of Ableism(242;243)

If one searches the net for the term ableism one finds a variety of definitions²⁴

Some use the term disablism to state the same content given in ableism.²⁵

However the above definitions are inadequate and misleading.

Every ism has two components. Something we cherish and something we do not.

Sometimes the ism's used relate to the second part, or to the first part or to both parts.

Ableism reflects the first part of the ism which is the obsession with certain abilities which leads to disablism (discrimination against the 'less able').

Many used definitions of ableism confuse the first part with the second part and they have the problem that they are limited to 'disabled people'. The used definition of disablism is correct however it's too limited in its focus on 'disabled people as this paper will show.

I use the terms ableism and as a consequence disablism in a much broader sense than the existing definitions.

Ableism is a set of beliefs, processes and practices that produce -based on ones abilities- a particular kind of understanding of oneself, one's body and one's relationship with others of one's species, other species and one's environment and includes one being judged by others. Ableism exhibits a favouritism for certain abilities that are projected as essential while at the same time labelling deviation (real or perceived) from or lack of these essential abilities as a diminished state of being leading or contributing to the justification of a variety of other isms (19;243;244)

²⁴ (<http://www.gobeyondwords.org/Ableism.html>) (<http://en.wikipedia.org/wiki/Ableism>)

(<http://www.answers.com/topic/ableism>) (<http://www.m-w.com/dictionary/ableism>)

²⁵ (<http://en.wikipedia.org/wiki/Disablism>) (<http://www.demos.co.uk/files/disablism.pdf>)

Every ism has two components: something we cherish and something we do not. The first, second or both parts may be emphasized.

Ableism reflects the sentiment of certain social groups and social structures to cherish and promote certain abilities such as productivity and competitiveness over others such as empathy, compassion or kindness (favouritism of abilities). (19;242;243) Ableism and favouritism of certain abilities is rampant today and throughout history. Ableism shaped and continues to shape areas such as human security(103), social cohesion(104), social policies, relationships among social groups and between individuals and countries and between humans and non-humans and humans and their environment. (242) Ableism is one of the most societal entrenched and accepted isms and one of the biggest enabler for other isms (e.g. nationalism, speciesism, sexism, racism, anti-environmentalism, consumerism, GDP-ism, superiority-ism...). Ableism related to productivity and economic competitiveness is the basis upon which many societies are judged, and it is often seen as a prerequisite for progress. The direction and governance of science and technology and different forms of ableism have always been inter-related.

Ableism will become more prevalent and severe with the anticipated ability of new and emerging sciences and technologies:

- to generate human bodily enhancements in many shape and forms with an accompanying ability divide and the appearance of the external and internal techno poor disabled (19)
- to generate, modify and ability enhance non-human life forms;
- to separate cognitive functioning from the human body; and
- to modify humans to deal with the aftermath of anti-environmentalism.
- to generate products atom by atom which moves the trade from nature based commodities towards atomic generated commodities which will change the way we trade

We can already observe a changing perception of ourselves, our body, and our relationships with others of our species, other species and our environment. New forms of ableism (transhumanization of ableism) (19;242) are now appearing which are often presented as a solution to the consequences of other ableism based isms such as speciesism(2) and anti-environmentalism.

Just a few examples of Ableism

Ableism against the traditional disabled people(242;242;245)

This form of ableism reflects the obsession with species typical normative abilities leading to the discrimination against the as ‘less able’ as impaired perceived disabled people.

This type of ableism is supported by the medical, deficiency impairment categorization of disabled people (medical model) (18;246) and this form of ableism rejects the ‘variation of being’, biodiversity notion/categorization of disabled people (social model). This form of ableism leads to the focus of fixing the person (medical model/medical determinant) or preventing more of such people (medical model/social determinants) and ignores mostly the acceptance and accommodation of people in their variation of being (social model/social determinant) (18)

Ableism against ‘traditional non-disabled people’(242;242;245)

Ableism has also long been used to justify hierarchies of rights and discrimination between social groups, and the exclusion of people who are not classified as 'disabled persons'. To give a few examples.

Sexism(242;245)

Sexism has two components. One cherishes a certain sex (usually male) and discriminates against another one (usually female). At the end of the 19th Century women were viewed as biologically fragile and emotional, and thus incapable of bearing the responsibility of voting, owning property, and retaining custody of their own children (247;248). Ableism and the favouritism towards certain abilities was and still is used to justify sexism in general and the dominance of males over females in particular.

Racism/Ethnicism (242;245)

Racism/**Ethnicism** has two components. One favours one race or ethnic group, and discriminates against another. The Bell Curve(249) used the societal inclination of many to judge human beings based on their 'cognitive abilities' (their IQ), promoting racism by claiming that certain ethnic groups are less cognitively able than others. Without the ableist judgement related to cognitive abilities, the authors would have received no coverage. If they had written about ethnic differences in hair color, or differences in average height, their position would have had much less impact. Society does not judge people nowadays based on their hair color and average height, therefore differences in hair color or average height can't be used today for racist arguments. People *are* judged based on differences in cognitive abilities, however, making this a useful target for justifying racist arguments.

Caste-ism(242;245)

Caste-ism has two components the favouritism for one caste and the discrimination against another. In an opinion piece The U.N., Racism and Caste – II Opinion: The Hindu 10 April 2001 by Gail Omvedt one reads "Neither caste as a social system nor "racism" are based on actual biological differences among human beings. Both, though, are systems of discrimination that attribute "natural" or essential qualities to people born in specific social groups. In other words, while caste has nothing to do with "race", the justifications of caste discrimination have a lot to do with the social phenomenon of "racism" and it continues; "For caste, like race, is based on the notion that socially defined groups of people have inherent, natural qualities or "essences" that assign them to social positions, make them fit for specific duties and occupations;"²⁶.

The natural inherent qualities are 'abilities' which make them fit for specific duties and occupations.

Ageism(242;245)

²⁶ <http://wcar.alrc.net/mainfile2.php/For+the+affirmative/16/>

Age-ism reflects the negative labelling and treatment of the elderly. This treatment is a consequence of young-ism which is the favouritism towards the abilities of the young (athleticism vs. wisdom for example).

Transhumanization of Ableism (generic form) (19;57;215;242;242;245)

Transhumanism "is a way of thinking about the future that is based on the premise that the human species in its current form does not represent the end of our development but rather a comparatively early phase". (250)

A new transhumanized form of ableism is appearing which is

"a set of beliefs, processes and practices that perceive the improvement of functioning of biological structures beyond typical boundaries as essential. The transhumanized version of ableism exhibits the favouritism of beyond biological structure typical abilities and perceived biological structures as deficient as being, in need of constant improvement, in a diminished state of being if they are not enhanced beyond biological structure typical abilities"(242;245)

Transhumanization of ableism related to humans (19;57;215) (242;242;245)

Until now a non- impaired person has been seen as someone whose body functioning performs within *Homo sapiens* typical parameters. This is changing, however. The ability of new and emerging science and technology products to modify the appearance of the human body and its functioning beyond existing normative species-typical boundaries allows for a redefinition of what it means to be non-impaired (18).

One transhumanized form of ableism is the set of beliefs, processes and practices that perceive the 'improvement' of human body abilities beyond typical *Homo sapiens* boundaries as essential. It exhibits the favouritism of beyond *Homo sapiens* typical abilities and perceived human bodies as limited, defective, in need of constant improvement, as being in a diminished state of being human if they are not enhanced beyond *Homo sapiens* typical abilities.

There are three kinds of transhumanization of body ability enhancements:

(a) **external** -- by shaping the environment (transhumanized social determinants); (b) **internal reversal** -- by modifying bodily structures in a reversible fashion (transhumanized medical determinant); and (c) **internal non-reversal** -- by modifying bodily structures in a non-reversible fashion (transhumanized medical determinant). All of these interventions are viewed as therapeutic (transhumanization of medicalization)(18).

Humans have modified their environment for a long time, in order to gain abilities that are not inherent in their body. This 'ability' to change the environment (transhuman social determinants) is viewed as the basis for the success of -- and essential for -- the *Homo sapiens* species (transhumanization of ableism).

However this is no longer seen as sufficient. In tune with the belief that the human body is deficient (transhuman medical model) -- which previously led to the design of external tools to extend the abilities of *Homo sapiens* (transhuman social determinants) -- we are moving increasingly towards changing the body itself to expand its abilities beyond those that are typical for *Homo sapiens* (transhuman medical determinant).

Internal transhuman interventions are consistent with the trend towards medicalization of the human body -- where variations in its structure and functioning are now more often labelled as deviations and diseases -- with the result that 'healthy' people feel 'unhealthy,' and bad about their bodily structure and functioning' (18). The transhumanized version of ableism elevates the medicalization dynamic to its ultimate endpoint, namely, to see the enhancement beyond species-typical body structures and functioning as a therapeutic intervention (transhumanization of medicalization) (18).

Enhancement medicine is the new field providing the remedy and maintenance through surgery, pharmaceuticals, implants and other intervention on the level of the body. Science and technology is seen as having the potential to free everyone from the "confinement of their genes" (genomic freedom) and the "confinement of their biological bodies" (morphological freedom) through transhumanized internal medical determinant interventions. Transhumanized social determinant external interventions are not seen as enough anymore (18;245).

It seems to fit well with the existing dynamic of the medicalization of the human body where more and more variations of human body structure and functioning are labeled as deviations as diseases and with the phenomenon that more and more 'healthy' people feel 'unhealthy, feel bad about their bodily structure and functioning' (18). The transhumanized version of ableism elevates the medicalization dynamic to its ultimate endpoint, namely, to see the enhancement beyond species-typical body structures and functioning as a therapeutic intervention (transhumanization of medicalization) (18).

It will lead very likely to a transhumanized version of disablism where those who do not have or do not want certain enhancements (the intrinsically techno poor disabled) will be discriminated against, given negative labels and suffer, oppressive and abusive behaviour and other consequences.

Anti-transhumanized version of ableism related to humans(242;245)

The rejection of the transhumanized version of ableism

Ableism driven Speciesism(242;242;245)

Speciesism assigns different values and rights to beings on the basis of their [species](#). Humans are seen as superior over other species due to their exhibition of 'superior cognitive abilities'. This speciesism led to behaviours where humans dealt and deal with other species according to "we can do it so we do it".

Transhumanized version of ableism related to non-human species(242;242;245)

Another transhumanized version of ableism is the set of beliefs, processes and practices which champions the especially cognitive enhancement of animal species beyond species typical boundaries, leading to cognitively or otherwise 'enabled species.' This is seen as a way to alter the relationship between humans and other species, and to change how non-human species are judged and treated.

This is often the approach. Instead of questioning the tenets of ableism, one tries to find ways for a disadvantaged group to become as able. “I can be as able as you are, I am as able as you are” can be heard quite often, and is used here as a solution for the maltreatment of some animals.

This version of ableism favors cognitive abilities. There are other examples.

Besides racism and speciesism, favouritism towards cognitive abilities plays out in the developmental stages of humans whereby humans prior to birth and for a certain period afterwards are seen as not having full human rights due to their lack of certain abilities. Lack of certain cognitive abilities is also used as an argument to deny some rights to ‘cognitively impaired humans.’

This same logic is also evident with respect to artificial intelligence, which may ultimately gain equal status to humans when it is seen as cognitively able enough. Human rights might then become an obsolete concept as once rights might not be based anymore on the fact that one is human but that one has a certain level of cognitive abilities (sentient rights). If it is eventually possible to separate cognitive abilities and consciousness from the human biological body, the resulting entity would gain rights by itself -- independent of the body.

Ableism driven Anti-Environmentalism (242;242;245)

The disregard for nature most humans show reflects another form of ableism: humans are here to use nature as they see fit as they are superior to nature due to their abilities. Humans might treat nature better if we can’t treat it badly anymore due to the ensuing negative consequences for humans. The second report in 2007 by the Intergovernmental Panel on Climate Change released April 6 predicts the ‘highway to extinction’.²⁷ A third report outlining potential solutions will be released on May 4.

Transhumanized version of ableism related to the environment(242;242;245)

However we might see the appearance of a climate change-driven appeal for a transhumanized version of ableism, where transhumanization of humans is seen as a solution for coping with climate change. This could become especially popular if we reach a so-called ‘point of no return,’ where severe climate change consequences can no longer be prevented.

A set of beliefs, processes and practices which champions the

- a) enhancement of especially the Homo sapiens beyond species typical boundaries to cope with the environmental challenges to come
- b) shaping the environment (geo-engineering, gated biospheres...)

Gross domestic product (GDP)-ism (242;242;245)

There are different ways to measure the growth of a society. For the longest time GDP based growth has been favoured while people based growth, people centered and sustainable development, social well

²⁷ <http://www.cnn.com/2007/TECH/science/04/01/climate.report.ap/index.html>

being and life satisfaction of people are still neglected. The NBIC report goal of human performance increase is linked to increased productivity and GDP-ism.

GDP is used by economists to judge the 'positive' advances of an economy but it can't be used to judge living standards, social development, social well-being and the level of satisfaction of people in a society have with their lives. It does not show the gaps between haves and have-nots.

The inclination towards a GDP-based measure is slowly changing. While we still measure the success of countries based on yearly GDP, we are also seeing greater use of social indicators to measure the social well-being of citizens. A recent (September 2006) Deutsche Bank research paper highlights nicely why measuring GDP is not enough, and identifies measures that can be used to characterize well-being²⁸.

The dimensions of well-being include income, education, health, the role of women, environment, social peace, diversity and welfare²⁹. The Deutsche Bank research paper refers to the United Nations' annual Human Development Index (HDI), the Weighted Index of Social Progress (WISP), the Happy Planet Index (HPI), the Genuine Progress Indicator (GPI), the Economic Living Standard Index (ELSI), and the National Wellbeing Index which is published by a variety of countries. Korea publishes a comprehensive statistical yearbook which includes 492 social indicators in 13 areas³⁰.

According to the research paper, the above measures still do not show how happy people are or how satisfied they are with their lives. It is not surprising that economists predisposed to measuring GDP have different priorities and views of what is needed than people who are focused on social well-being and life satisfaction.

Consumerism (242;242;245)

Consumerism is based on the desire to have the ability to consume. This is often linked in North America to the right to choose, and legally it is linked to a negative rights framework (simply put, you should not stop me in my action, but you have no obligation to help me). This form of ableism has an influence on many other isms. It also changes our perception of needs – the notion of human wellbeing and fulfilment of potential is replaced by the right to experience instant gratification.

Superiority-ism (242;242;245)

Superiority-ism -- the obsession with being better than others, with outdoing others, and often with controlling others -- is an entrenched ism within the social framework of how humans treat other humans, other species, and (one could say) even the environment. Superiority-ism uses ableism to justify its claim (I am more able than...therefore...) . The desire to be superior to others often drives ableism.

This is just a small list of isms which are supported by ableism and favouritism of certain abilities all of which are a threat to among others a culture of peace and social development.

²⁸ http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD000000000202587.pdf;jsessionid=1:451222c9:87a20b23d84617b

²⁹ http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD000000000202587.pdf;jsessionid=1:451222c9:87a20b23d84617b

³⁰ http://www.nso.go.kr/eng2006/e03_0000/e03a_0000/e03aa_0000/e03aaf0000/e03aaf0000.html.

Setting the Stage XI Transhumanism and Religion:

In the introduction of a special issue on Transhumanism and Religion by the Journal for Evolution and Technology one reads

"It has also involved various theologians and religious ethicists seeing the need to consider and address the emerging technological worldview represented by transhumanism, resulting in a recognition that there is something compelling about the transhumanist vision of the world; touching on a desire for a life that overcomes the brokenness of this world, a place where pain and suffering are eliminated. This is a longing that is articulated in many religious traditions, those that subscribe to a distinctive eschatological belief in a future where humanity is perfected and transformed. However, within these areas of consonance, transhumanism also advocates some notions about the nature of humanity and the role of technology that can be problematic for some (or perhaps many) approaching from a religious worldview. "(251) The intro poses the question "whether a religious-based or syncretic transhumanism is possible or desirable"(251)

outlining the history of the dialogues on transhumanism and religion and commonalities and problems

"While recognizing shared values within the Christian and Transhumanist narratives (desires for eternal life, humanity being changed into a perfected self and direct involvement in the creative process) it also highlighted the inherent problems of understanding fallible humans acting as co-creators or engineers of their own grace and perfection." (251)

Several areas of common interest surfaced for transhumanists and those from a Christian religious perspective. One was the belief that technology is a value-laden enterprise leading to common concern for social justice, so the benefits of technology would be available to more than merely the social and economic elite. Another was the idea that while life extension raises problematic issues; it is not completely contrary to a belief in God or a higher reality. Through discussion it was also agreed that more work needs to be done in joint exploration of human identity, role and importance of embodiment, as well as teasing out distinctions between therapy and enhancement and what "spiritual" enhancement might look like. (251)

Another paper on the topic of Religion and Transhumanism which was written recently by the former executive director of the World Transhumanist Association³¹ should be of interest to WCC members and people interested in interreligious relations & dialogues.

Characterization of Transhumanism:

Campbell and Walker state (251)

Some argued that using technology to alter humans (and non-humans) is the best and only means to obey the Utilitarian imperative to maximize happiness for the greatest number of beings.

Another possibility is to understand transhumanism in terms of a perfectionist ethic.(252)

Perfectionism is the philosophical view that we have a duty to develop excellence in our lives. It says that developing our minds and bodies are intrinsically good things to do. While we may gain a certain amount of happiness from achieving some level of cognitive or physical excellence—completing a university degree, or competing in the Boston marathon—such achievements are intrinsically good. In other words, this good is independent of all subjective feelings of happiness such accomplishments might bring. (252)

³¹ Hughes, J, The Compatibility of Religious and Transhumanist Views of Metaphysics, Suffering, Virtue and Transcendence in an Enhanced Future, <http://www.metanexus.net/magazine/tabid/68/id/9930/Default.aspx>, 2007.,Global Spirit

Another characteristic according to Walker and Campbell I that "Transhumanists think there is no difference as which means to use (nurture, or to alter nature to achieve) to achieve the same ends."
(251)

Secular development I: The appearance of enhancement medicine

If one links the possible inevitability of enhancement (at least some of them) with the increased popularity of the transhumanist model of health, disease, disability, and well-being, with the dynamic of medicalization, and with the transhumanization of medicalization, it comes as no surprise that the emerging field of enhancement medicine will become an increasingly flourishing field of medicine providing the remedy through surgery, pharmaceuticals, implants and other means (50) and that it might become the number one cash cow for many hospitals and medical practitioners such as 'body engineers', 'body designers' and body techno-maintenance crews.

Interventions on the level of the individual which add new or improve on existing abilities of the Homo sapiens body might be routinely seen as the remedy for ill "medical and social health" and bad physical, mental and social wellbeing" (transhumanist determinants)

Secular development II: The decrease in curative medicine and the appearance of the transhumanist/enhancement burden of disease

Curative medicine to the old 'normative functioning' of the Homo sapiens might increasingly be seen as futile medicine, futile care, a waste of health care and medical resources.

A transhumanized version of the DALY

Policy makers have been trying for a long time to determine how to use health budget dollars in a way that both maximizes the utility and limits the inefficiencies of usage of health budget dollars. The Disability Adjusted Life Years (DALY) (253-263) is a measure developed in the 1990s and refined ever since which was explicitly developed to "curtail allocative inefficiency" (258).

"Third, most individuals familiar with the allocation of resources across different health interventions in health systems around the world recognize that there is substantial allocative inefficiency (allocative efficiency is used to mean here the allocation of resources across different health interventions so as to maximize health measured in some fashion). There are clear examples of low-cost interventions with significant beneficial effects on health that are not delivered and examples of expensive interventions with minimal health effects that are delivered." p. 707 (258)

The DALYs follow the philosophy that it is more efficient to spend money on people who are less ill as less money is needed to bring a certain amount of people back to full health (258). To quote Murray and Acharaya (Murray being the father of the disability adjusted life years (258))

"In fact, as shown above the results are quite consistent across groups that individuals prefer, after appropriate deliberation, to extend the life of healthy individuals rather than those in a health state worse than perfect health" (p. 726) (258)

The spirit of this quote allows for the justification of a hierarchy of treatment of people with ill medical health whereby the ones which are deviating the least from a "species typical medical health state are treated first.

It furthermore allows for the following interpretation

" individuals prefer, after appropriate deliberation, to ENHANCE the life of healthy individuals rather than those in a health state worse than perfect health."
might become the foundation of moving resources towards 'enhancement medicine' and away from 'curative medicine' together with the approach of the DALY to not take social determinants into account.

which allows for the justification of a societal development where one favors 'enhancement medicine over 'curative medicine' seeing pure curative medicine as futile and waste of health care dollars. (18) This shift might also be lucrative from another economic standpoint as enhancement medicine provides the remedy through surgery, pharmaceuticals, implants and other means and could become the number one cash cow for many hospitals and medical practitioners such as 'body engineers', 'body designers' and body techno-maintenance crews. (18)

"The DALY approach does not take into account the likelihood of the fact that effects of illness can be worsened by lack of income, friends and public services etc. because the use of DALYs is to guide public policy that affects directly or indirectly the onset and the treatment of diseases." p.723(258) "Principle 2. The non-health characteristics of the individual affected by a health outcome that should be considered in calculating the associated burden of disease should be restricted to age and sex" p.709(258) "DALYs do not measure fully the impact of ill health on well-being," p.723(258)

Murray's view to include age and sex as the only social determinants considerations might be useless The term sex might become obsolete through the action of the field of 'body design and engineering' which might make the concept of male, female, the link of sex to reproduction and the traditional ways of sexual activity obsolete/
The term "age" might become obsolete through the action of the medical field of immortality/ continuous stepwise life extension.

Transhumanized version of burden of disease

Taking into account the transhumanist/enhancement model of health and disease and the DALY philosophy outlined above it is easy to envision that the Daly type of burden of disease will become the transhumanist/enhancement burden of disease being the logical endpoint of 'Murray's views linking the burden of disease not to a deviation from old Homo sapiens typical functioning but to the lack of enhanced functionalities and life extension and productivity modification of sentient being.

Secular development III: The Techno Poor Disabled and the Ability divide:

As more powerful, less invasive and more sophisticated enhancements become available the market share and acceptance of enhancement products will grow. This could very likely develop into a situation where those who do not have or do not want certain enhancements (the techno poor disabled) will be discriminated against, given negative labels and suffer difficult consequences (transhumanism of ableism). For any given enhancement product there will not be a bell curve distribution, but rather a distribution jump from the "have nots" to the "haves" which will lead directly to an ability divide. What will change— depending on the social reality such as GDP of the economy, income levels and other parameters – is how many people end up as 'haves' or 'non

haves' (techno poor disabled). The ability divide will be bigger between low and high income countries than it will be within low middle and rich countries. The ability divide will develop between the poor and rich within every country. Not everyone can afford the enhancement of ones body. And no society can afford to enhance everyone's body if everyone so wishes. Those deemed healthy by most people today, but who cannot afford or don't want the technological enhancements, will become the new class of 'techno-poor disabled.' Billions of people that today are seen as 'healthy' will be seen as 'disabled' not because their bodies have changed, but precisely because they have not changed their bodies in accordance with the transhumanist norm. The enhancement of the body will become the currency for ones survival. Not being able to enhance ones body will be seen as limiting options for employment, income generation, education and other areas. It might lead to low self esteem.

In some ways how societies will deal with the techno poor disabled might be ascertained from how societies deal with the 'traditional disabled people'.

Secular development IV: An intensification of the personhood and species-ism debate

All United Nations based documents use the term 'person' with the meaning 'anyone born a Human' and the concept of 'Human' rights. The United Nations Comprehensive and Integral International Convention to promote and protect the Rights and Dignity of Persons with Disabilities is also based on this concepts of 'person' and Human rights.

However the term 'person' changed throughout history (264-266) and will change further in the future. Advances in science and technology which increasingly allows for the modification and enhancement of the Homo sapiens and other species beyond species typical boundaries, and the design of new life forms through synthetic biology, might lead people to believe that it is essential to change the concepts of 'person' and 'human rights' from its meaning of today towards the concept of 'sentient being rights' and the linkage of the term 'person' not just towards 'Humans' but to cognitive abilities of any species. It is interesting that ethicist in 2005 after the passing of the UNESO declaration on bioethics and Human rights identified the difficulty to impossibility of linking bioethics to Human rights.(267;268)

It is of importance to define a 'practical ethics' and a theological framework which one could use as a guidance in regards to the modification of different species and the bottom up design of new species. One has to address the question of whether *Homo sapiens* should retain its special elevated status above other species(269). One has to address the question whether a consent is needed for the modifications of Homo sapiens and other species. Is it ethical to modify existing sentient forms of different species if they gave their consent (voluntary consent; voluntary modification) and is it ethical to modify non sentient forms of species if it is broadly believed that the modification is in the interested of the species (non voluntary consent; non voluntary modification). Is the modification of sentient beings against their will ethical? Under which circumstances if any? Can we design new life forms for the particular purpose of serving another species making this new life form a slave to another species? Whether one can not see a newly designed species as a slave for another species till the new species is sentient? Whether the new life form is better of even as a slave as the alternative would be non-existence?

Secular development V: The concept of responsibility.

Many see the usage of genetic and non genetic screening and genetic/non genetic therapy to ensure an as 'healthy' a homo sapiens child as possible as a parental responsibility (238;270). Many see this as common sense. It can be envisioned that preventative medicine is used in the cases that enhancement medicine can't be employed to fix a problem or give alternative adaptations which makes the 'defect an inconsequential problem as the enhancements compensates for it with an alternative mode of functioning. However, curative medicine might be

seen as a waste of resources in the future. If enhancement medicine can't be employed preventative or elimination medicine is employed.

Secular development VI: Disabled people drift towards the Transhumanist/enhancement model of 'disability/impairment'

Traditional Disabled becoming Transhumanists:

If one looks at the reality of the bad treatment of the 'traditional' disabled people it might be assumed that 'traditional disabled people' would welcome a shift towards the transhumanist/enhancement model of health, disease, well-being and 'disability/impairment' as it would move the focus away from particular forms of impairment, towards the ability to enhance oneself – a challenge which the 'traditional disabled people' would share with other 'unenhanced people'.

Indeed many transhumanists were very aware of the potential to use disabled people as a trailblazer for the acceptance of transhumanist/enhancement ideas and products. (235;236): From James Hughes the executive director of the World Transhumanist Association one reads:

" Although few disabled people and transhumanists realize it yet, we are allies in fighting for technological empowerment." (235)

However, as many 'traditional disabled people' are poor and live in low-income countries they have far more to lose than gain from such a shift. Furthermore some 'traditional disabled people' might think that they are better off because they would share that lack of ability with others who can't afford the enhancement, we can expect that resources would never be 'wasted' on the ones who are below the traditional norm because with the same amount of money one could enhance more people who already fit the traditional norm than people who digressed from the traditional norm.

Secular development VII: Scientific and techno solutions for social problems?

Example Nanowater(96):

"More than 1 billion people in the world lack access to clean water, and 2.6 billion to sanitation, according to a recent United Nations Development Program [report](#) (see [also](#)). Halving the number of people without access to water and sanitation is on the [list](#) of Millennium Development Goals.

Nanotechnology can be involved with water in numerous ways, including desalination, detoxification, sanitation, decreased use of water, hydrogen usage, and hydro-generated power, to name a few.

Many documents, such as the Determinants of Health by the Canadian Population Health Initiative, the Public Health Agency of Canada Determinants of Health, the different declarations of the international conferences on health promotion and the Declaration of Alma-Ata International Conference on Primary Health Care, (Alma-Ata, USSR, 1978) state that access to clean water and sanitation is an essential determinant of health.

NBIC (nano, bio, info, cogno) technologies -- especially nanofilter, nanocapsules, nanotubes and other nanowater technologies for water treatment and remediation -- have many promising applications (see links below).

Water recently made it to [third place](#) in a ranking of the top 10 nanotechnology applications for development.

It appears that a lot of research is now being done into nanowater and filters -- as was previously the case with biofilters. But is that enough? Technology alone will not solve the problem of accessibility, and all stakeholders should have a place at the table.

A few questions have to be asked.

Are existing filters less useful than nano-based filters in general, or for a particular application like desalination? Do they cost more? How successful are nano-based filters in reaching people in need? The [Human Development Report](#) states that 1.2 billion people have gained access to clean water in the past decade (see [also](#)).

Why do we still have more than one billion people without water? Will they be reached by nano-based technologies, or will nano just replace bio and other technologies we have in use already? Many water purification systems exist that have been developed without the "nano" label.

How do we choose the best paths to solve a particular problem? How do we choose between different technologies? We have very few assessment tools, and those we do have compare different technologies -- not costs and benefits, efficiency, or the utility of a technological solution compared with a social intervention (one of my future columns will deal with technological versus social solutions).

If we shift into the political arena, what role do nanowater technologies play in the public debate around ownership of water, and debates in the [World Water Forums](#)? How will they be affected by the current debate on nanoparticle safety?

Last but not least, do the technologies used to generate clean water and sanitation take into account every group of society? With regard to disabled people, the question has to be answered with a 'No'. Disabled people - from both the North and the South - have rarely been involved in the discourse around clean water and sanitation. It is rare that initiators and organizers of stakeholder meetings think of disabled people as stakeholders. It is rare that disabled people are identified as a group affected by a particular issue related to water.

A recent report on water written by 25 UN agencies ignored the different needs disabled people have with respect to water and sanitation. Their problems are often different from those of non-disabled people. Clean water and sanitation is inadequate, if delivery does not take into account the different modes of functioning of disabled people (see links below on access to water for disabled people).

It is insufficient to highlight technological advances, and reference applications that increase public acceptance of the technology. These problems are much too serious to fall prey to sales pitches. Technology -- whether high-tech or low-tech -- is of utter importance in achieving clean water and sanitation for all. But a technology is only as good as society allows it to be, and as good as the input that is considered in defining the problem. Political, policy and technological discourse at the United Nations, or at the government, industry NGO or CSO level, will gain a lot from broadening the discourse."

Example Two Nanofood(97):

Nanoforum, a group from Europe, says in its recent report on [Nanotechnology in Agriculture and Food](#) that food is nanofood when "nanotechnology techniques or tools are used during cultivation, production, processing, or packaging of the food. It does not mean atomically modified food or food produced by nanomachines." Although the definition seems to be artificially narrow with this exclusion, it still gives a good idea of how much food will be nanofood in the future.

The second [Nano4Food Conference](#) is around the corner. According to the conference webpage, nanotechnology will be able to solve a variety of problems in the food industry by enabling increases in productivity and cost-effectiveness; providing better food processing, packaging and logistics; helping in the design of new healthier and tastier products; and providing better food safety and quality assurance.

Envisioned applications are nanoscale biosensors for pathogen detection and diagnosis; nano-delivery of bioactive/nutrient ingredients in foodstuffs through improved knowledge of food materials at the nanoscale; and nanoscale filtration systems for improved texture modification.

According to the [Helmut Kaiser Consultancy](#) "more than 180 applications are in different developing stages and a few of them are on the market already. The nanofood market is expected to surge from 2.6 bn. US dollars today to 7.0 bn. US dollars in 2006 and to 20.4 bn. US dollars in 2010. More than 200 companies around the world are today active in research and development. USA is the leader followed by Japan and China. By 2010 Asian with more than 50 percent of the world population will be the biggest market for nanofood with the leading of China."

Nanotechnology is envisioned to be used in food production, processing, preservation, flavor and color improvement, hygiene, safety and packaging. Nanomaterials include nanocomposites, nanoclays, nanotubes and others. Nanosensors, nanoimaging and nanochips will be used, as will nanofilters. Nano delivery systems will use nanocapsules, nanocochleates, nanoballs, nanodevices, nanomachines and nanorobots.

Two annexes to the report [Down on the Farm](#) by the ETC Group give further ideas of where nanofood is heading: Annex 1: Nanotech R&D at Major Food and Beverage Corporations; and Annex 2: Nano Patents for Food and Food Packaging.

Nano-Nutraceuticals and Nano-Functional Food

Agri-Food Canada [defines](#) nutraceuticals and functional foods as “food components that provide demonstrated physiological benefits or reduce the risk of chronic disease, above and beyond their basic nutritional functions. A functional food is similar to a conventional food, while a nutraceutical is isolated from a food and sold in dosage form, in both cases the active components occur naturally in the food.”

Biofortified” foods (fortified with vitamins, minerals, etc.) are another development (see the golden rice debate).

Bio-engineering and genetics have so far been envisioned as tools to produce more nutritious and functional food. But nanotechnology is moving fast into this area. The Nanoforum report on [Nanotechnology in Agriculture and Food](#) gives many examples.

Nanocapsules -- “Nanocapsules containing tuna fish oil (a source of omega 3 fatty acids) in “Tip-Top” Up bread.”

Nano-sized Self-assembled Liquid Structures -- “The Israeli Company Nutralease, utilises Nano-sized Self-assembled Liquid Structures (NSSL) technology to deliver nutrients in nanosized particles to cells. Nutraceuticals that have been incorporated in the carriers include lycopene, beta-carotene, lutein, phytosterols, CoQ10 and DHA/EPA.” “The technology has already been adopted and marketed by Shemen Industries to deliver Canola Activa oil.”

Nanocochleates -- “Biodelivery Sciences International have developed nanocochleates, which are 50 nm coiled nanoparticles and can be used to deliver nutrients such as vitamins, lycopene, and omega fatty acids more efficiently to cells, without affecting the colour or taste of food.”

Interactive and Smart Foods -- “Kraft foods have established a consortium of research groups from 15 universities to look into the applications of nanotechnology to produce interactive foods. These will allow the consumer to choose between different flavours and colours. The consortium also has plans to develop smart foods which will release nutrients in response to deficiencies detected by nanosensors, and nanocapsules which will be ingested with food, but remain dormant until activated. All these new developments will make the concept of super foodstuffs a reality, and these are expected to offer many different potential benefits including increased energy, improved cognitive functions, better immune function, and antiaging benefits.”

Nano-carriers -- “The German company Aquanova has developed a new technology which combines two active substances for fat reduction and satiety into a single nano-carrier (micelles of average 30 nm diameter), an innovation said to be a new approach to intelligent weight management. Called NovaSOL Sustain, it uses CoQ10 to address fat reduction and alpha-lipoic acid for satiety. The NovaSol technology has also been used to create a vitamin E preparation that does not cloud liquids, called

SoluE, and a vitamin C preparation called SoluC. The NovaSOL product can be used to introduce other dietary supplements as it protects contents from stomach acids. 43 In a different strategy, Unilever is developing low fat ice creams by decreasing the size of emulsion particles that give ice-cream its texture. By doing so it hopes to use up to 90% less of the emulsion and decrease fat content from 16% to about 1%.”

The Nanoforum report provides other evidence that nanotechnology is now finding broad application:

“The Woodrow Wilson International Center for Scholars in the US has produced a consumer database of marketed nanotechnology and has so far identified more than 15 items which have a direct relation to the food industry. The list includes nanoceuticals developed by RBC Life Sciences and Canola Activa oil developed by Shemen Industries; the use of silver nanoparticles in refrigerators manufactured by LG Electricals, Samsung and Daewoo to inhibit bacterial growth and eliminate odours; All Spray For Life® which is manufactured by Health Plus International and uses a newly-designed pre-metered, non-aerosol Nanoceutical Delivery System (NDS) for transmucosal administration of dietary supplements, resulting in increased-bioavailability compared with gastrointestinal absorption. A detailed list of products is available on the website.”

According the report [Down on the Farm](#) by the ETC Group, BASF produces a nano-scale version of carotenoids, a class of food additives which it sells to major food and beverage companies worldwide for use in lemonades, fruit juices and margarines.

Taste Nanology and StabilEase are two recent examples of products developed by the California-based company [Blue Pacific Flavors](#).

Questions Raised

The report [Down on the Farm](#) by the ETC Group -- and others -- show that the issue is not simple (see Resources below). Questions have to be asked, such as: Are high-tech solutions the best option or are low-tech or no-tech solutions available, possible, and more feasible and effective? Golden rice is often used as an example for a high-tech solution to vitamin A deficiency but aren't there other -- maybe better and cheaper -- ways available to deal with vitamin A deficiency? It is not self-evident or a forgone conclusion that high technology is the best or only solution for poverty, hunger and malnutrition (see [UN report](#)). According to the [UK food regulator](#), 'gaps' in regulating nanotechnology exist. Food and water are for sure an issue for the WCC and the WCC works on them. Its just not about genetics anymore but also nano and synthetic biology. For example in the case of nutraceuticals, for example, what is the best way to use bio, genetic, nano, low-tech, no-tech and social measures (or a combination) to eliminate malnutrition and disease -- especially for people in low-income countries.

Secular development VIII: Scientific and techno solutions for social well being?

One can envision that access to technology external or internal related to the body might increasingly be seen as the solution to bad social well being. One might see a shift away from societal changes to promote social well being to science and techno solutions like pills to achieve the goal that the person feels well socially and otherwise.

Secular development IX: Medical health and environmental safety 'Yes', Social Safety 'No'

Searching Google, Google Scholar and a variety of academic clusters of databases one finds that the keyword combination 'Nanotechnology and safety' has Twenty Thousand times more hits than the combination 'Nanotechnology and distributive justice. Nanotechnology teamed up with human rights has only 20% of the hits of the combination Nanotechnology and weapons and only 1% of hits of the combination Nanotechnology and health

So far the regulation discourse seems to be much more concerned with medical health and environmental safety than social safety

Secular development X: A hierarchy of social groups:

Searching Google, Google Scholar and a variety of academic clusters of databases one finds a hierarchy of visibility of and concern for in regards to different social groups with disabled people and indigenous people all the time on the bottom. Much higher hits are obtained with patients than with disabled people indicating a very medical flavor of the NBICS discourse

Issues for theology, religion, faith and Churches I: What will be the theological view of health, disease and disability?

The commission for human security states in their 2003 report "Good health is both essential and instrumental to achieving human security. It is essential because the very heart of security is protecting human lives. Health security is at the vital core of human security—and illness, disability and avoidable death are "critical pervasive threats" to human security. Health is defined here as not just the absence of disease, but as "a state of complete physical, mental and social well-being". Health is both objective physical wellness and subjective psychosocial wellbeing and confidence about the future. In this view, good health is instrumental to human dignity and human security. It enables people to exercise choice, pursue social opportunities and plan for their future.(271)

An interrelationship exist between direction in and governance of science and technology and the concepts of 'health', 'disease', 'wellbeing', 'disability', and 'impairment'. On the one hand technologies such as NBICS impact on these very concepts. On the other hand these concepts do impact on the direction and governance of research and development of NBICS.

The very terms health, disease, illness and sickness, medicine and healing are cultural constructs which are in constant flux (see Freitas in his book Nanomedicine (272), Wolbring in a recent report for the Alberta Heritage Foundation for Medical Research (273) and the 'a secular view of health, disease and disability/impairment' section of this ebook).

But what is the understanding of health, disease, well-being and disability/impairment within the theological discourse?

Guijarro a professor in the Faculty of Theology of the Pontifical University of Salamanca cites in his article (274) work from Hogan(275) who described the Healing in the Second Temple, and Wells(276) who looked at the Greek language of healing from Homer to the New testament times.

Pilch who teaches scripture at Georgetown University, Washington stated in a in recent issue of the Biblical Theology Bulletin(277)

"In a cross-cultural perspective, the "normal" human situation is known as well-being. Even before beginning formal education, members of a culture learn what well-being means in their culture. Health is but one element of human well-being".

Pilch does not interpret wellbeing as a determinant of health in accordance with the WHO definition of health(208) but he views health as a determinant of wellbeing which becomes more common nowadays(209;210).

According to Pilch(277) it is a misfortune when a person loses any aspect of well-being. Sickness is just one human misfortune.(277)

Pilch expands

"For medical anthropologists, the English word "sickness" identifies a reality, the loss of some aspect of health however a culture has defined it. The words "disease" and "illness" are not realities. Rather, they are explanatory concepts presenting two different perspectives on the reality, "sickness."

Disease is an explanatory concept (not a reality) that describes abnormalities in the structure and/or function of human organs and organ systems

Illness is an explanatory concept that describes the human (in contrast to the biomedical) perception, experience, and interpretation of certain socially disvalued states including but not limited to disease. Illness describes both a personal and a social interpretation of the reality, sickness. The individual may be afflicted, but that individual's social network (family, village, etc.) is also involved and afflicted. From this perspective, illness is in large part a cultural construct. Culture dictates what to perceive, value, and express, and then how to live with the illness."

For Guijarro a professor in the Faculty of Theology of the Pontifical University of Salamanca illness refers to the perceptions and experiences that a person has of his/her condition (274).

The fluctuant state of interpretation of the terms health, disease, illness and others must be a challenge for the interpretation of health related terms used in scriptures because translators over the times used their cultural understanding of the terms when they encountered the terms in the scriptures. Pilch e.g. believes that the term miracle should not be in any bible translation as no Greek or Hebrew word exist for this term(277). If one searches different English language versions of the Bible one finds significant differences between the versions.

| | Sickness | Health | Disease | Illness | Disability/ Impairment | Curing/ Cure | Healing/ Heal | Physician/ Healer/doctor | Miracle |
|-----------------------------------|----------|--------|---------|---------|---------------------------|-----------------|------------------|-----------------------------|---------|
| New International Version | 13 | 18 | 62 | 16 | 0/0 | 0/34 | 39/182 | 5/0/5 | 42 |
| King James Version | 23 | 17 | 34 | 0 | 0/0 | 0/9 | 14/149 | 11/1/3 | 37 |
| New King James Version | 21 | 16 | 25 | 3 | 00 | 0/11 | 22/189 | 11/0/0 | 17 |
| 21 Century King James Version | 23 | 16 | 34 | 0 | 00 | 0/12 | 15/151 | 11/1/3 | 37 |
| Holman Christian Standard Version | 20 | 28 | 85 | 16 | 1/0 | 1/23 | 40/179 | 4/1/7 | 26 |
| Worldwide English New Testament | 7 | 0 | 6 | 0 | 0/0 | 0/0 | 2/130 | 0/0/16 | 0 |
| Contemporary English Version | 10 | 48 | 103 | 3 | 0/0 | 0/13 | 11/240 | 0/0/10 | 133 |
| Revised Standard Version | 21 | 25 | 95 | 9 | 0/0 | 0/16 | 34/191 | 18/3/0 | 13 |
| New Life Version | 47 | 0 | 186 | 0 | 0/0 | 0/4 | 31/245 | 0/0/12 | 110 |
| Amplified Bible | 19 | 37 | 86 | 8 | 0/0 | 5/40 | 35/163 | 13/1/1 | 60 |
| The Message | 10 | 68 | 89 | 5 | 0/0 | 2/13 | 39/216 | 3/3/16 | 70 |

It is of interest to note the non existence of terms such as disability and impairment in any version.

If one takes Pilch's interpretation of the terms sickness, disease and illness one could correlate illness with disability a cultural interpretation of a misfortune and disease with impairment being a biomedical problem.

However although the disease/impairment pair might work the illness/disability pair might not work. Illness in Pilch's sense is a passive term (there is some misfortune) whereas disability reflects a misfortune (e.g. discrimination) and is used much more as an active term demanding action by others to rectify the misfortune which is seen as being caused by the sickness (the reality according to Pilch). It is interesting how Pilch deconstructs the usage of the term leprosy within bible translations as inaccurate and therefore the usage of the term disease in the passages which are also using the term leprosy. (277)

Pilch interprets the discourse within medical anthropology to mean that **curing** is the outcome anticipated relative to a disease, namely, a successful attempt to gain effective control over disordered biological and/or psychological processes (277) whereby **healing** is directed toward illness and is an attempt to provide personal and social meaning for the life problems created by sickness, whether it is a disease or an illness. (277)

Pilch's interpretation of the terms healing and curing is consistent with concepts I used in the section on secular view on health and disease. Healing would mean to act on the social determinants of health in the medical or social meaning whereas curing means acting on the medical determinants of medical health. Healing interpreted in such way could be seen as being linked to the term disability. However the interpretation of healing does not come without problems at least for disabled people. Pilch e.g. states that the suicide of a terminally person could be seen as healing. (277) However he does not explore this notion further how much the people were pushed towards the suicide how much they were pushed towards that form of healing.

If healing includes self driven solution then it might be not quite fitting with the meaning of the term disability as that one for the most part is used to describe a situation where the social situation is the problem and the solution comes from the society the others.

We don't have a term which would depict the notion that the disabled person can 'heal' gets rid of the 'disability' the 'societal problem' through ones own action. I can not see that suicide would be seen as a solution of the 'disability'. So if we want to link the medical anthropology interpretation of healing as outlined by Pilch we may have to define a new term.

Furthermore whether one uses the terms healer/ physician or doctor also has consequences. The table above shows that different English bible translations use the terms to a different amount. A "physician" is someone licensed to practice medicine. The term was for the first time used in the USA in 1809. (277). The Oxford English dictionary defines a doctor as a teacher or instructor and derives from Latin. Now both terms are developed later so healer might be the right term to use in the scriptures. The Amplified bible translation uses the term doctor as meaning teacher whereas the 'message' translation uses doctor in a medical meaning. However what is the 'job descriptions' of a 'healer'? Healer today is defined in many ways sometime meaning physician. May be the way to go is to link healer to the meaning of the term healing as described above. If one looks at the bible translations which use the term physician it becomes apparent that these passages mention the term physician in relation to the usage of the term disease and medical fixes.

Healer should be seen as more holistic. However the Revised Standard bible (RSV) links healer to disease in

Exodus, chapter 15

26: saying, "If you will diligently hearken to the voice of the LORD your God, and do that which is right in his eyes, and give heed to his commandments and keep all his statutes, I will put none of the diseases upon you which I put upon the Egyptians; for I am the LORD, your **healer**."

Within

Isaiah, chapter 3

7: in that day he will speak out, saying: "I will not be a **healer**; in my house there is neither bread nor mantle; you shall not make me leader of the people."

the term healer could be seen as being more than a fixer of disease

The role of the healer and the process of healing at the time of Jesus is described by Guijarro as follows

"The ways of understanding and experiencing health and illness in the world of Jesus and of the first Christians show noteworthy similarities with the "non-Western" medicines predominant in pre-industrial societies. The medical systems of these societies have in common a series of traits such as the following: (1) the symptoms of illness are explained on the basis of the belief that there exists an interdependence between the natural, the supernatural, the society, and the person; (2) the "healer" has a precise knowledge of the patient's social roles within the community and shares the values and social norms of the patient; and (3) participation in the healing process by other significant persons, mainly members of the extended family, relatives and neighbors, is decisive in the overall process." (274)

Guijarro and Pilch see the concept of healing as being in contrast to today's Western medicine which for the most part excludes the social and spiritual parameter.

Guijarro goes on comparing the health care system of today and of the time of Jesus.

As he rightly states

"The health care system is not a real entity but rather a conceptual model elaborated on the basis of what the persons involved think and do vis-a-vis health and illness in a given social context. This model includes, therefore, perceptions, expectations and value judgments that are not always conscious. But it also takes into account the reactions and patterns of behavior of those involved in the illness and in the healing process. Both the perception of illness and the reactions to it are governed by cultural values, and are subject to the influence of different social factors such as institutions, roles, and relations in which the evaluation and treatment of the illness take place."
(274)

In its overall structure a health care system consists of three sectors which intersect in various ways: the popular sector, the professional sector, and the folk sector. In the popular sector, the most important one, the treatment of the illness is carried out by those belonging to the social networks of the sick person, notably family and relatives. It is in this non-specialized sector, deeply rooted in popular culture, where the treatment of illness is defined and initiated in most cases. The professional sector is governed by formal institutions and persons trained for this task through a socially sanctioned process. Because of their specialization, personnel in this sector usually propose their version of clinical reality as the only acceptable one. Finally, the folk sector comprises another series of different medical approaches. Some of them are close to the professional sector, but most are related to the popular one. It is in this last sector that we find the traditional healers. These three sectors are defined differently within each culture, and even within various social groups in the same culture. Furthermore, each culture establishes an implicit hierarchy which determines the way a sick person will pass from one sector to another in search of health.(274)

There are examples of the popular sector in the bible (Mark 1:30) (Mark 7:25; 9:17-18), (Mark 2:3-4), (Luke 7:74).(274)

Access to these three sectors of the health care system was determined by different factors. We can suppose that popular medicine was always the first recourse. When healing could not be achieved through it, resourceful families would have recourse to professional medicine, but this was a luxury reserved to very few. Moreover, it is very probable that among the most traditional strata of Palestinian society (those on the lowest rung), recourse to this kind of medicine would stir up considerable distrust, since in some way it could be an affront against the sovereignty of God over health and illness. For the majority there remained recourse to the popular healers of folk medicine. This would avoid conflict with traditional allegiance to Israel's God, because in the end it was a type of religious healing. It is in this sector of folk medicine that the healings of Jesus must be located.(274)

Guijarro employs his understanding of the health care system and the health models (274)by analysing of Mark 10:46-52, the healing of Bar Timaeus. He feels it "is better understood when placed into the structure of the prevailing health care system of first-century Palestine. The story belongs in the folk sector of that system, but it is noteworthy that at first the case was dealt with in the popular sector, and that Timaeus' family had no access to the professional sector. As we have seen the folk sector of the Israelite health care system was closely related to the tradition of the prophet healer. This relationship points to the Israelite roots of Jesus' healing activity."

The study of the explanatory model that the story takes for granted helps to clarify how blindness was understood and experienced at the time of Jesus. For Jesus and his contemporaries it was not only a disease but an illness that had strong religious, social, and cultural implications. According to the Levitical purity system, blindness implied, first of all, an exclusion from the political religious system. This exclusion was symbolized in the prohibition to enter the Temple. Furthermore, in a society which had honor as its core value, blindness entailed also a social segregation, because those who could not see were unable to participate in the main social interactions.

On the other hand, understanding the story from the perspective of the cultural model of the healing process allows us to unveil the purpose of the healings performed by Jesus. In them the "miraculous" dimension, emphasized in traditional apologetics, was really of little importance. What was important was the social and political religious nature of the process. The healing of the blind man implies a healing of the roots of sin, which occurs through faith in the God of Israel (political

religious dimension), and a social reintegration that entails the removal of all the signs of his exclusion (social dimension).

Finally, a better knowledge of how sickness and healing was perceived in the social context of Jesus can be of great help to elucidate the specific traits of his activity as a healer. Perhaps the most relevant one was his therapeutic strategy. His therapeutic strategy was completely different from the one promoted by the Levitical health care system. These two strategies rest on different understandings of purity. Whereas the Levitical system promoted the exclusion of the sick, the strategy followed by Jesus strove for his inclusion. Jesus' healings, like his exorcisms and his meals, expressed what the kingdom of God meant in a culturally relevant and eloquent manner. One of the most revealing signs of the coming of this kingdom was the social reintegration of outcasts. Eating with sinners, healing the lame and the blind, and exorcizing the possessed were various manifestations of one and the same project: to show how the kingdom of God was present in the activity of Jesus."(274)

The meaning of health, disease, sickness, illness, disability and impairment within the WCC sphere of influence:

Health is very important as a theme within WCC members and the scriptures. Which models of health, disease, impairment and disability (medical, social, transhumanist/enhancement) can be identified within the interpretation of the scripture relevant to the WCC and within the thinking of the WCC and its members?

The very fluctuant situation around the concept of health, disease, wellbeing, disability and impairment is one of the reasons why the report "A Church of All and for All" produced by the Ecumenical Disabilities Advocates Network (EDAN) has a direct bearing on the ethical challenges arising in the field of bio-technology as Raiser said.(24).

Before I cover some of the members of WCC I would like to quote Pope John Paul II who defined medicine in 1983 in his *address to members of the World Medical Association as follows*(278)

It is necessary first of all to help man to live and to surmount the handicaps which impair the normal functioning of all his organic functions, in their psycho-physical unity. Man also is at the center of the preoccupations of the Church whose mission it is, by the grace of Christ, to save man, to restore him in his spiritual and moral integrity, to lead him toward his integral development where the body has its part. This is why the ministry of the Church and the witness of Christians are united in their solicitude for the sick. The search for a satisfactory position on the ethical level, however, depends fundamentally on one's basic conception of medicine itself. What must be established definitively is whether medicine is, indeed, at the service of the human person, or his dignity, of what he has of the unique and of the transcendent, or whether medicine is considered, first of all, as the agent of the community, at the service of the interests of those in good health, to whom the care of the sick would be subordinated.

A second point that I would like to stress is the unity of the human being. It is important that we do not isolate the technical problem posed by the treatment of a specific illness from the attention paid to the person of the patient in all his aspects. It is well to recall this when medical science tends toward specialization in each discipline. The doctor of yesterday was, above all, a general practitioner. His attention embraced, first of all, the totality of bodily organs and functions.

Then, too, on another plane, it was easier for him to be acquainted with the patient's family, his milieu, his whole medical history. Evolution is inevitable; it depends on the specialization of studies, and on the complication of life in society. At least you should unceasingly make the effort to keep in mind the profound unity of the human being, in the evident interaction of all his bodily functions, but also in the unity of his bodily, affective, intellectual and spiritual dimensions.

Peters a professor of Systematic Theology at Pacific Lutheran Theological Seminary and the Graduate Theological Union in Berkeley, California cites from a reprint in the Journal Origins of the 1983 address of Pope John Paul II (166) "From a Christian perspective, then, health envisions optimal functioning of the human person to meet physiological, psychological, social, and spiritual needs in an integrated manner."

The quote from Pope John Paul II seems to be consistent with the WHO understanding of health(208) and the dynamic model of health(279).

However the question is: What is optimal? Is this a static concept or is it changing? It seems obvious that optimal is not static but a term embedded into societal realities and structures. That also means that Transhumanism can be seen as essential for optimal functioning. A debate around the interpretation of the term optimum and its boundaries or lack thereof is needed to be able to interpret the quote from Pope John Paul II

The protestant Church of Germany in a publication from 2002(280) acknowledges the reality of science and technology driven reinterpretation of the terms health and disease when they state

So wird beispielsweise die sich ausweitende prädiktive genetische Diagnostik, die individuelle Risikoangaben für unterschiedliche Krankheitsanlagen machen kann, Fragen nach der Definition von Krankheit und Gesundheit neu stellen.

The increased use of predictive genetic diagnostic, and the individual risk assessment for different disease predepositions will lead to the renewal of questions in regards to the definition of health and disease

(Translation paraphrased by author)

They do not state where the concept of health might go, however their publication seems to suggest that the EKD sees the term health within a medical model framework and the term disability within an impairment framework.

It is interesting that the EKD paper states that there is a legal right for freedom of research into decreasing the suffering from diseases and healing of diseases (Art. 5 Abs. 3 GG). That statement opens up all kind of consequences once the health and disease term moves towards a transhumanist/enhancement model understanding.

Harakas a former professor of theology at Holy Cross Greek Orthodox School of Theology in Brookline, Massachusetts writes in a paper for the Greek Orthodox Archdiocese of America (281)

"some of the most beloved figures in the Orthodox Christian tradition combined faith in God and the exercise of a healing ministry. The Evangelist Luke was a physician. His Gospel and Book of the Acts of the Apostles seem to have an unusually large number of medical terms and references to medical situations. Saints such as Cosmas and Damian, the two brother physicians, and St. Panteleimon are examples of widely venerated saint-physicians of the Orthodox Church. During the Byzantine period of the history of the Orthodox Church, there were a number of priest-physicians as well who combined the sacred duties of the Altar with the healing ministrations of the physician (Constantelos, 1975). And this was not in any way an inappropriate combination. For the life of our

Savior, Jesus Christ, was also dedicated to a healing ministry. The four Gospels repeatedly record Christ's concern with the physical well-being of the people. Frequently, stories are related of persons who sought out Jesus to be healed of illnesses. He [God] is, in the first and most fundamental sense, "the healer of soul and body," as it says in the Orthodox priest's 'Prayer Book. In the Orthodox Church, we not only pray for the healing of sickness through priestly "Prayers for the Sick," but the Church has always offered the healing of God to the faithful through the sacrament of Anointing, or Unction. Unlike other Churches, our Orthodox understanding of this 'sacrament of prayer - oil' has always taken the scriptural words at face value and with seriousness.

"Is there any one among you suffering? Let him pray ... Is any among you sick? Let him call for the presbyters of the Church, and let them pray over him, anointing him with oil in the name of the Lord; and the prayer of faith will save the sick man, and the Lord will raise him up; and if he has committed sins, he will be forgiven" (James 4.13 - 15).

But to emphasize the healing power of God does not mean that human efforts at healing are downgraded. On the contrary, medical treatment is also seen as a human cooperation with God's healing purposes and goals. In fact, all of Orthodox teaching recognizes a place for human effort, striving and cooperating with God's will. Technically known as 'synergy,' this belief requires the exercise of human talents and abilities for salvation, for spiritual growth, for moral behavior, for achievement of human potential as well as for the fulfillment of God's will in all things related to our community and social life. So, in principle, the use of healing, medicines, therapeutic diet practices, even surgical operations have generally been understood throughout history in the Church as appropriate, fitting and desirable ways of cooperating with God in the healing of human illnesses.

Further down Harakas states

"Health care.

It follows quite logically that the care of one's own health and societal concern for public health are moral imperatives (Androustos, pp. 191-195, 250). Throughout its history, Eastern Orthodox Christianity has concerned itself sacramentally with the physical health of the faithful. The Sacrament of Holy Unction has not been conducted as a service of the "last rites." Rather, it is a healing service conducted both publicly and privately for the faithful. One of the constituents of the condition of original sin in which man actually finds himself is sickness. Total harmony of the creation with God would in fact eliminate sickness and ill health. The spiritual and physical dimensions of health are closely bound together in Orthodox thought. Thus, it was natural for the priest and the physician often to be one and the same person (Constantelos, 1967).

The issue of the allocation of scarce medical resources demands a general principle of distribution. Neither the ability to pay nor an aristocratic criterion of greater human value or worth is acceptable. Eastern Christianity has always distinguished between the essential value of human life and social worth. In spite of the enormous difficulties involved, the ethical imperative from the Orthodox perspective calls for the widest possible distribution of health care and life-protecting facilities and resources, rather than a concentration of such resources for the select few. The famous health care center established by Saint Basil in the fourth century in Cappadocia of Asia Minor was designed to reach as many people as possible. It and similar institutions embodied the Eastern Christian view on health distribution (Constantelos, 1968, chap.11).

Four issues in the above writing of Harakas are of importance within the framework of this ebook.

1) Harakas interprets medicine and healing only as dealing with physical wellbeing omitting the social well being. He seems to fit with today's climate to limit the more holistic view of health as outlined in the 1948 definition of health. 2) The concepts of "the healer of soul and body" "care of one's own health and societal concern for public health" are open for interpretation and the transhumanist/enhancement model of health, disease, wellbeing and disability/impairment very likely allows for a serious reinterpretation of the concept "healer of soul and body". 3) Interpreting the concept of 'synergy' to mean that human talents and abilities should be used for the achievement of human potential is up for reinterpretation as the transhumanist/ enhancement model and technological advances change the meaning of 'human potential'. 4) When Harakas talks about the "widest possible distribution of health care and life-protecting facilities and

resources, rather than a concentration of such resources for the select few" this statement could be construed to be in sync with Murrays vision of the Disability adjusted life years outline elsewhere in this ebook where one treats the ones the least ill as in this case more people could be treated. This ebook has shown elsewhere that such a line is not that easy drawn and his believe that 'very little objection was expressed by the Church" could be interpreted to mean that indeed the Church just goes with the flow leading in the end to the acceptance of the transhumanist/enhancement model of health, disease, wellbeing and disability/impairment.

In Harakas(281) article one reads further

"Mental health: values, therapies, institutions.

At the heart of the Eastern Orthodox Christian approach to mental health is the understanding of human wholesomeness in the doctrine of theosis. True and full human well-being is the consequence of our proper relationship with God (Demetropoulos, pp. 155-157). Mental health is one dimension of this total relationship. Since no individual human being perfectly achieves this relationship, it may be noted that, just as we are all in some measure "less than fully human," in the same manner we are all in some measure lacking in full mental health.

This quote has obvious consequences with the rise of the transhumanist/enhancement model of health, disease, wellbeing and disability/impairment.

EDAN and the meaning of health, disease, sickness, illness, disability and impairment

The EDAN report "A Church of All and for All" eloquently identifies (point 13-16) the medical, the deficiency model as being a dominant model in the theological interpretation of the scripture.

The theologian Ronald Cole-Turner is just one of many examples of such interpretation of the scripture. He states among others

It is in the actions of Jesus Christ where we find a framework for evaluating genetic defects. We have the necessary framework for comprehending the notion of a genetic defect. A human genetic defect is that which causes a condition comparable to those which evoked the compassionate intervention of Jesus of Nazareth and which is therefore disclosed as contrary to the purposes of God. Specifically, these defects are skin diseases, mental and neurological disorders, losses in hearing, sight, the usage of limbs among other unnamed diseases.(282)

'Setting the stage I' give many examples of how WCC members and committees follow a medical view of disabled people and put a lot of emphasis on using the concept of 'medical reason' and the elimination of diseases, disorders and defects as a justification for the selective usage of science and technology products and applications.

They are of course on solid ground as their views are shared by many theologians and lay people alike.

To quote Ronald Cole Turner as quoted by Daly a PhD candidate at the School of Divinity, University of Edinburgh(283)

Therefore, what counts as a defect—whether on the genetic or some other level—can be discerned "*in reference to God's intentions.*" Therefore, "that which is defective is that which may be changed or altered" by technology. Thus, genetic engineering can be viewed theologically as redemptive and creative technology. (282) p. 92

And as Daly concurs

Of course, this notion of waiting does not imply that Christians need not be active participants in redeeming God's created order. As Ronald Cole-Turner correctly pointed out, the actions of Jesus provide warrant waging a battle against the diseases and maladies that mark our finite existence. Similarly, Christians are called to the fields of medicine and technology to help fight sickness and disease as a demonstration of Christ's incarnational activity, yet with the understanding that the ultimate redemption of our bodies will be accomplished at the resurrection of the dead.

EDAN questions the medical interpretation of the scripture. In the same way as the medical model of disability is challenged by the social justice model of disability in the secular discourse so does the EDAN report "A Church of All and for All" questions in its section "Disabilities and Healing" (points 33-50) the medical model of disability and the victims theology and asks for a rethinking of the interpretation of the healing actions of Jesus putting in essence forward a social model of disability interpretation of the healing events described in the scripture when they state:

38. Other definitions of healing make a clear theological distinction between healing and curing. Healing refers to the removal of oppressive systems, whereas curing has to do with the physiological reconstruction of the physical body. For some theologians, Jesus' ministry was one of healing and not curing.

39. In this kind of theology, disability is a social construct, and healing is the removal of social barriers. From these perspectives, the healing stories in the gospels are primarily concerned with restoration of the persons to their communities, not the cure of their physiological conditions. For example, the man with leprosy in Mark 1:40-45 who asks Jesus to make him clean is mainly asking Jesus to restore him to his community. In like manner, in Mark 2:1-12, Jesus met the paralytic and forgave him his sins.

40. Forgiving sins here means removing the stigma imposed on him by a culture in which disabilities were associated with sin. Hence this man was ostracised as sinful and unworthy of his society's acceptance. In these healing stories Jesus is primarily removing societal barriers in order to create accessible and accepting communities.

I would add that Hebrews 12:12-14

12 Therefore, strengthen your feeble arms and weak knees. 13 "Make level paths for your feet," [a] so that the lame may not be disabled, but rather healed
could be also interpreted as supporting the elimination of the social barriers over the medical fix.

What EDAN hasn't done yet is to look at the impact of the transhumanist model on EDAN arguments and reasoning and the situation of disabled people within the WCC something EDAN has to start.

Drawing lines: Un-tenability of the term serious:

The term 'serious' or 'severe' is often used to imply that there is a qualitative or ethical difference between targeting a so-called 'severe' or 'serious' and 'non-severe' or 'non-serious' disease, impairment or defect. Documents from WCC members (see setting the stage I) also use the term serious as a line drawing instrument. This approach to line drawing however is not tenable.

As the chair of the (protestant church of Germany) EKD stated in 2003

Die Praxis der Pränataldiagnostik (PND) hat über einen längeren Zeitraum gezeigt, dass die Absicht, ihre Anwendung strikt einzugrenzen, nicht durchgehalten worden ist (284)

Translation: The praxis of prenatal diagnostic has shown for some time that the intent to limit its usage was not tenable.

The chair of the protestant church of Germany is not alone in this sentiment. Ultimately, there is no way to distinguish between different so-called diseases, defects, disorders, and impairments. Reality tells us that ethics and other policies do not draw a line between 'severe' or 'serious' and 'non-severe' or 'non-serious' but between using the concepts of 'medical reasons' versus 'social

reasons'. (285;286) An expert commission of the European community used the following argument to denounce a distinction between different disabilities, diseases, and diseases:

"We can't make distinctions between disabilities in regards to the usage of predictive testing because to label some disabilities as severe enough for disability deselection would stigmatize these disabilities" (285;286).

The UNESCO (2002) draft report on pre-implantation genetic diagnostic and germ-line intervention uses the following argument:

"An often-debated subject is line drawing in case of the indications both for PGD [preimplantation genetic diagnostic] and PD [prenatal diagnostic]. Thus far all professional organizations in clinical genetics and reproductive technology as well as advisory groups on bioethics have argued against lists of diseases which can be defined as severe enough to justify PGD or PD. The number of monogenic diseases alone exceeds 5000 and nearly each of these has variant of different severity and clinical course. In addition, the same disease may be perceived differently by different couples depending on their family history, religious and socio-economic background, life situation, and future expectations"(287).

Drawing lines: Un-tenability of the line between medical versus social/non-medical reasons

If one can not draw a line between diseases as outlined above can one draw a line between 'diseases' and so called 'non-diseases'?

Many think one can distinguish between an act done for medical versus social reasons. This line is at the root of the reality that on the one hand many WCC documents (see setting the stage I) and other international(40;42;287-289) and national documents (40;42;44;45) demand the prohibition of sex selection for 'non-medical reasons' but allow for the deselection of serious hereditary sex-related disease and in the end for any non-sex linked disease, defect, impairment, disorder However the distinction between medical versus non-medical reasons is not tenable especially taking into account the transhumanist/enhancement models of health, disease and disability, the arguments used to denounce the usage of the term serious. There is also some inconsistency within WCC documents as some use arguments on a certain topic which would preclude the distinction between sex and disease. Furthermore to make a distinction between sex and disease is obviously discriminatory ((290;291).

An expert commission of the European community used the following argument to denounce a distinction between different disabilities, diseases, and diseases:

"We can't make distinctions between disabilities in regards to the usage of predictive testing because to label some disabilities as severe enough for disability deselection would stigmatize these disabilities" (285;286).

If this argument were true, wouldn't a distinction between sex and disability or the targeting of 'disabilities in general' stigmatize the 'disabled' and their families? Indeed disabled people and their families are quoted as saying that they felt stigmatized by the use of prenatal diagnostic for disability deselection(292).

Every argument used to justify sex selection prohibition could also be used to demand disease, defect, impairment deselection, ability selection prohibition and any arguments used to denounce the demand for the prohibition of disease, defect, impairment deselection, ability selection can be used just as well to denounce the arguments used to demand the prohibition of sex selection.

One line of arguments says that sex selection poses significant threats to the well being of children and siblings, the children's sense of self worth and the attitude of unconditional acceptance

of a new child by parents, so psychologically crucial to parenting(42;44). However, is this a specific argument for the prohibition of sex selection?

Could the argument not read as follows "One line of arguments says that ability selection/disability deselection poses significant threats to the well being of children and siblings, the children's sense of self worth and the attitude of unconditional acceptance of a new child by parents, so psychologically crucial to parenting"?

A second line of arguments justifies sex selection prohibition by pointing out the negative consequences for the unwanted sex. (42;44) Other theorists see sex selection as a form of sex discrimination.(42;44) Still other researchers see sex selection leading to the enhancement of sex stereotypes which means that people will have certain expectations towards people with one sex or another.(42;44) Would not the following version of the above also hold true?

"People explain that ability selection/disability deselection is leading to the oppression of the people with unwanted disabilities leading to social injustice. Others see ability selection/ disability deselection as a form of disability discrimination and others again see ability selection/disability deselection leading to the enhancement of ability/disability stereotypes which means that people will have certain expectations towards people with one ability/disability or another.

A third line of arguments sees sex selection leading to 'designer babies and trivializes the selection procedure leading to the selection of children based on 'cosmetic reasons'. (42;44) However, one could ask, What is cosmetic? Cosmetic is something based on established norms. Is it cosmetic to have no legs or being shorter or being obese or having black hair, being intelligent or to have blue eyes? Is the term cosmetic another synonym for characteristics not affecting abilities? This leads to the following questions: Which abilities are needed that still fit within acceptable variation from the norm and which don't? Who decides what are cosmetics? The same questions have to be raised for the usage of the term designer baby.

A fourth line of argument states that sex selection is wrong because it is not a disease.(42;44) This argument is not an ethical argument but rather a 'hierarchy' argument. Besides, with the appearance of the transhumanist model and the appearance of enhancement medicine and body engineering the concept of disease becomes elusive to define.

As to the inconsistency of WCC document.

A recent statement of the CONFERENCE OF EUROPEAN CHURCHES COMMISSION FOR CHURCH AND SOCIETY WORKING GROUP ON BIOETHICS GENETIC TESTING AND PREDICTIVE MEDICINE(293) October 2003 states:

2. The threat of liberal eugenics

Also, imposing on parents a choice which is not their own and that they then cannot deal with, amounts (or would amount) to society or the State adopting an attitude parallel to that of "traditional" eugenics which seek to control procreation and family life. While it is true that society has a duty to make a place for those whom life has injured or disabled, and to accord them a place, it is legitimate to think that society should not attempt to provide a substitute for the wishes and the inner strength of parents. Society itself can benefit from giving responsible support to families who choose to welcome children who will have special needs. In any event, the Churches should continue to nurture this debate and promote it with a view to strengthening truly responsible societies and solidarity.

The reasoning used in this quote would not even allow the prohibition of sex selection. If "society should not attempt to provide a substitute for the wishes and the inner strength of parents" that means that parents in for example India do not have the wish and inner strength to have a baby girl society should not interfere. From a disability rights perspective this quote is actually better as it takes away one cause of disability discrimination. However it opens the door for the total commodification of children and a medical technological solution (eugenics) for societal injustices. I

am not sure whether the CONFERENCE OF EUROPEAN CHURCHES COMMISSION FOR CHURCH AND SOCIETY WORKING GROUP ON BIOETHICS had this in mind when they phrased there argument in such a way. I believe it would be better to rephrase demand a) of the 1989 WCC report called "BIOTECHNOLOGY: ITS CHALLENGES TO THE CHURCHES AND THE WORLD(28)" so that it reads

- a) Calls for the prohibition of prebirth genetic and non-genetic testing for human characteristics.

That demand seems to fit with the statement of the position paper of EUROPEAN ECUMENICAL COMMISSION FOR CHURCH AND SOCIETY EECCS(34), 1996 where they state

"We must also distinguish clearly between wishing to have a child and wishing to have a "perfect" child. Moreover, we should be aware of the "tyranny of normality". That is to say, there is a danger that our societies begin, with our new knowledge, to make some level of health, and particularly the absence of certain so-called genetic "defects", into a kind of societal norm. By comparison with this norm, anyone with a "defect", or any foetus diagnosed to carry a "defect", is regarded as "abnormal" and in some sense less than a full member of human society. The churches wish to alert the Council of Europe to this possibility. In contrast, our evaluation of all human persons is their unique worth or dignity as children of God, without regard for their ability or disability, genetic or otherwise."

Drawing lines: Un-tenability of the line between therapy and enhancement

This ebook has shown elsewhere that it is not easy if not impossible to draw a line between therapy and enhancement or between therapeutic and non-therapeutic enhancements. What is the sentiment within the WCC and the theological discourse?

The debate within theological circles seems for the most part to assume that there is a distinction between therapy and enhancement

Harakas in a paper for the Greek Orthodox Archdiocese of America (281) states

"These new techniques create some questions for the Church. It is one thing to use medical procedures to restore the patient to normal functioning. It is another to alter, on an ongoing basis, the physiology and the psychology of the patient through continued medical intervention. Yet, even here, there has been very little objection expressed by the Church. We have seen the benefits to individual persons and have thanked God for them, by and large."

His musing seem to reflect one stream of arguments used today which believes that one should distinguish between therapeutic and enhancement interventions.

Statements by the Russian Orthodox Church(294) such as

"while drawing people's attention to the moral causes of infirmities, the Church welcomes the efforts of medics aimed to heal hereditary diseases. The aim of genetic interference, however, should not be to 'improve' artificially the human race or to interfere in God's design for humanity,"

seem to also draw a line between therapeutic and enhancement interventions

The EKD paper(280) outlines the human life as limited and that a human being is only a full human after being resurrected by God. This view put them in confrontation with life extension/immortality research (see elsewhere in this background paper about that line of research).

However others like Peters Professor of Systematic Theology at Pacific Lutheran Theological Seminary and the Graduate Theological Union in Berkeley, California does see the line between therapy and enhancement not as clear cut. (166)

Drawing a bright sharp line between therapy and enhancement seems easy to do. Therapy is ethical, whereas enhancement is not. Yet, is it so easy? For the theologian, the line gets blurry quite quickly. Let's ask: if therapy focuses on health, does this refer strictly to bodily function? Let's also ask: if the Christian faith emphasizes redemption, would this lead to embracing all forms of human betterment, even enhancement? Still one more question: would good health within Christian theology include enhancement? The blurry line between the physical and the non-physical—even social or relational dimensions of life—are reflected in how interpreters of the Christian faith understand health. Pope John Paul II worked with a relevant definition of health. "From a Christian perspective, then, health envisions optimal functioning of the human person to meet physiological, psychological, social, and spiritual needs in an integrated manner."¹⁹ Theologian Carl Braaten would agree with the late pontiff. "There is a dimension of healing that goes beyond the medical and the therapeutic. A person as a centered self is more than a . . . system of physical functions and more than a body. A person is spirit.' It is with the person that we work in Christian anthropology, not strictly the body, even though the body is positively incorporated. So, if we contribute to a person's health with the intent of edifying his or her spirit, does this require enhancement of virtually every department of life: physical, mental, spiritual, relational, social? We will not debate the ethical issue further here. What we need to gain from this brief discussion of therapy and enhancement is this: theologically, we think a human being is bodily, to be sure, but more than merely a body. A person is an integrated whole, one that includes body, soul, and spirit.

However Peters has a very limited interpretation of the terms therapy and enhancement and healing.

By 'therapy' bioethicists mean healing, the addressing of a pathology for purposes of restoring health. By 'enhancement' bioethicists refer to medical measures that improve an individual's functioning or improve the human species beyond what had previously been thought to be its norm. Therapy is a response to a pathology, whereas enhancement initiates an improvement without reference to a pathology. (166)

Question is: Does Peters talk about healing or curing? Many Bioethicists see therapy indeed in the context of curing a disease a pathology not in the context of social well-being and healing. Then he seems to be inconsistent when he says "bioethicists refer to medical measures that improve an individual's functioning or improve the human species beyond what had previously been thought to be its norm", where he clearly uses the term 'medical' and then states "whereas enhancement initiates an improvement without reference to a pathology" (136) taking it out of the medical context. I would say that bioethicists for he most part stay within the medical framework within the debate of enhancements.

However despite certain semantic problems with the above in general I think Peters is right that the therapy versus enhancement line or the therapeutic enhancement versus non therapeutic enhancement is an untenable line as was the line between severe and non severe in the genetic elimination debate. These are feel good lines to allow for a intervention event to go ahead without 'unduly' alarming the population by giving them the impression as if they won't be effected. These feel good lines play on the You-I thinking so criticized by EDAN as being to prevalent as a relationship within the WCC between the disabled and non disabled.

Issues for theology, religion, faith and Churches II: Transhumanism, disabled people and imago Dei

Many different definitions and interpretations of Imago Dei exist among others from EDAN and some transhumanists.

Imago Dei is a theological term, applied uniquely to humans, which denotes the symbolical relation between God and humanity. The term has its roots in Genesis 1:27, wherein "God created man in his own image. . ." This scriptural passage does not mean that God is in human form, but rather, that humans are in the image of God in their moral, spiritual, and intellectual nature. Thus, humans mirror God's divinity in their ability to actualize the unique qualities with which they have been endowed, and which make them different than all other creatures: rational structure (see [logos](#)), complete centeredness, creative freedom, a possibility for self-actualization, and the ability for self-transcendence. (295)

Imago Dei - Longer definition: The term *imago Dei* refers most fundamentally to two things: first, God's own self-actualization through humankind; and second, God's care for humankind. To say that humans are in the image of God is to recognize the special qualities of human nature which allow God to be made manifest in humans. In other words, for humans to have the conscious recognition of their being in the image of God means that they are the creature through whom God's plans and purposes can be made known and actualized; humans, in this way, can be seen as co-creators with God. The moral implications of the doctrine of *imago Dei* are apparent in the fact that if humans are to love God, then humans must love other humans, as each is an expression of God. The human's likeness to God can also be understood by contrasting it with that which does not image God, i.e., beings who, as far as we know, are without self-consciousness and the capacity for spiritual/ moral reflection and growth. Humans differ from all other creatures because of their rational structure - their capacity for deliberation and free decision-making. This freedom gives the human a centeredness and completeness which allows the possibility for self-actualization and participation in a [sacred](#) reality. However, the freedom which makes the human in God's image is the same freedom which manifests itself in estrangement from God, as the myth of the Fall (Adam and Eve) exemplifies. According to this myth, humans can, in their freedom, choose to deny or repress their spiritual and moral likeness to God. The ability and desire to love one's self and others, and therefore, God, can become neglected and even opposed. Striving to bring about the *imago Dei* in one's life can be seen as the quest for wholeness, or one's "essential" self, as pointed to in Christ's life and teachings. (295)

Others state that there are three main views of *Imago Dei* (296) the

Substantive View "which understands the *imago Dei* to refer to certain *qualities* or *attributes* in humans that mirror those of God Himself.

The Relational View sees the image of God not as something *in* man, but rather in his *relationship* to God or even other humans, that the *imago Dei* finds its locus in the human capacity to reflect "the internal communion and encounter present within God

and **the Functional View which** holds the image of God to be contained primarily and manifested directly in that which a person *does*.

Erickson who taught theology at several evangelical seminaries believes that there are three plausible answers as to what separates humans from the rest of creation: (a) Humans are relational beings, (b) Humans are rational beings, and (c) Humans exercise volitional will. (297)

Three schools are often cited in regards to the *Imago Dei*, the Irenaean Theodicy, the Augustinian Theodicy and the Process Theodicy (298)

Harakas(281) states for the orthodox church

"Theological anthropology.

The *humanum* of our existence is both a given and a potential. Some of the patristic authorities distinguish between the creation of human beings in the "image" of God, and in his "likeness." "Image" is the *donatum* of intellect, emotion, ethical judgment, and self-determination. In fallen

humanity these remain part of human nature, albeit darkened, wounded, and weakened. The "likeness" is the human potential to become like God, to achieve an ever expanding, never completed perfection. This fulfillment of our humanity is traditionally referred to as *theosis* or "divinization." Human beings are in fact "less than fully human." To achieve *theosis* means to realize our full human potential. Ethically, this teaching leads to the acceptance, on the one hand, of the existence of a "human nature," but, on the other, it clearly does not restrict our "*humanum*" to conformity to that nature. The "image" provides a firm foundation for ethical reasoning. The "likeness" prohibits the absolutizing of any rule, law, or formulation (Maloney). "

Which version of the above Imago Dei one follows has broad consequences. Harakas views that humans are less than fully humans and that the teaching 'clearly does not restrict our "*humanum*" to conformity to that nature' could be interpreted as allowing for the transhumanist interpretation of 'God's Children outline elsewhere in this ebook.

Imago Dei and disabled people

The interim statement "A Church of All and for All" which was presented by EDAN to the World Council of Churches CENTRAL COMMITTEE(22) outlines EDAN's thoughts on Imago Dei as it relates to disabled people

22. In the history of Christian theology, the notion that humanity is made in the image of God has tended to mean that it is the mind or soul which is in God's image, since the bodily (corporeal or physical) aspect of human nature can hardly represent the incorporeal, spiritual reality of the transcendent God. We should not underestimate the profound reaction against idolatry in early Christianity; no animal or human form should be taken to represent God who is invisible. However, the perceived kinship between our minds and God's Mind (or Logos), coupled with the assumed analogy between the incarnation of God's Logos in Christ and the embodiment of the (immortal) soul/mind in the human person, encouraged a predominantly *intellectual* interpretation of how human beings are made in the image of God.

23. This tendency may at times have permitted the positive acceptance of intelligent persons with physical disabilities: e.g., Didymus the Blind (4th century) was nick-named Didymus the See-er because he saw more profoundly than those with physical sight. It has also encouraged positive (if somewhat patronising) responses to persons with profound and multiple disabilities on the grounds that "you can see the soul peeping out through their eyes". But this understanding of human nature is both inherently elitist and dualist. It ultimately tends to exclude those whose mental or physical incapacities profoundly affect their entire personality and existence.

24. More recently, the notion that humanity is made in the image of God is taken to mean that *each* of us is made in the image of God and, therefore, each of us deserves to be equally respected. It conspires with modern human rights ideologies to encourage individuals to assert their right to a decent deal in society, and to recognition of each person's inherent dignity, no matter what his/her race, religion or impairment.

25. This tendency has had a positive impact in encouraging respect for those who are not white, male, able-bodied and intelligent. But it has also exacerbated the prejudice that we should all be perfect since we are made in God's image. Obvious failure to reach such notional perfection then becomes problematic. How can this person, who apparently has physical or mental defects, be made in God's image? The modernist rights approach may challenge the attitudes of some past traditional societies, but the success-oriented values of modern individualism encourage an interpretation of *imago Dei* which, we would argue, does not take account of core elements in Christian theology.

26. The phrase we are examining occurs in the Genesis narrative of the creation of Adam. So there are two important features that need to be taken seriously: firstly, Adam represents the whole human race. The very name Adam means man-humanity in the generic sense, for the creation of Eve from his rib represents sexual differentiation in the human race. Secondly, while Adam was indeed made in the image and likeness of God, this was marred by his disobedience, classically known as the Fall. Some early theologians suggested that he retained the image but lost the

likeness. The point here is that glib theological talk about being made in God's image needs to be countered with a sensitivity to the *corporate* nature of that image, and the fact that *all* have fallen short of the glory (image) of God (Rom 3:23).

27. For the Christian community, this reflection on Genesis 1 is confirmed by the New Testament. A reading of Paul's Epistles soon shows that the dynamic of salvation depends upon the parallel between Adam and Christ. Adam is the "old man", Christ the "new man" (Rom 5:2, 2 Cor 5:17), and all of us (male and female) are in Adam and potentially in Christ (Romans 7, 1 Cor 15:22).

Both are in some sense corporate figures. In Christ we are a new creation, but as in Adam all die, so in Christ all will be made alive. In a sense, Christ alone is the true image of God; the image of God in Adam (the old humanity) was marred. So we are in God's image because we are in Christ.

28. If Christ is the true image of God, then radical questions have to be asked about the nature of the God who is imaged. At the heart of Christian theology is a critique of success, power, and perfection, and an honouring of weakness, brokenness and vulnerability.

29. Being in Christ is being in the Body of Christ. This is essentially a corporate image; a body is made up of many members, all of whom bring different contributions to the whole (1 Cor 12, Romans 12). Indeed, the weak limbs (members), and even those body parts we are ashamed of and cover up (see the Greek of 1 Cor 12:23), are indispensable and are to be especially honoured, their essential contribution recognised. Furthermore, this is a physical image, and the physical reality was that in His bodily existence, Christ was abused, disabled, and put to death. Some aspects of God's image in Christ can only be reflected in the Church as the Body of Christ by the full inclusion and honouring of those who have bodies that are likewise impaired.

30. We would therefore argue that:

Christian theology needs to interpret the *imago Dei* from a Christological and soteriological (the saving work of Christ for the world) stand-point, which takes us beyond the usual creationist and anthropological perspectives.

Christian theology needs to embrace a non-elitist, inclusive understanding of the Body of Christ as the paradigm for understanding the *imago Dei*.

Without the full incorporation of persons who can contribute from the experience of disability, the Church falls short of the glory of God, and cannot claim to be in the image of God.

Without the insight of those who have experience of disability, some of the most profound and distinctive elements of Christian theology are easily corrupted or lost.

31. *"When any one of us, or a group of us, is excluded because of some lack of ability, we are prevented from using our God-given gifts to make Christ's body complete. Together, let us make the beautiful mosaic that God intends."* (Norma Mengel on mental illness)

32. The study of the Bible as the source of Christian theological reflection and as the revelation of the purpose of God, and the knowledge of the Creator, leads us to the certainty that we have accepted and been accepted by a God of Love. It is God who encourages us to live in the light of his Son with our errors, afflictions and disabilities. The prophet Isaiah points to the One who carries all our afflictions (Is 53:4-6). The God "who shows no partiality" (Gal 2:6), includes everyone in His bosom, male or female, whatever their physical or mental conditions.

A recent report by the National Council of Churches, USA(27) *seems to mirror the spirit of the Church of all and for all document(22) when it states*

*"Our humility must extend as well to our own limited knowledge of God's infinite design. Human frailties have allowed us too often to be glib about what constitutes "normal" or "whole" or "able-bodied" life. In so doing we relegate many of our sisters and brothers to the status of "other", seeing only their differences, which we call "disabilities," rather than seeing them as those who manifest, like us, reflections of the *imago dei*"*

However if one reads on, one encounters the following statement,

"The National Council of Churches is committed to the pursuit of justice in church and society, including the elimination of poverty, racial justice, justice for women, environmental justice, and responses to the urban crisis."(27)

This kind of listing leads to the perpetual existence of disabled people as 'others' as disabled people are not listed as usual.

A transhumanist Imago Dei

Many groups have a stake in the interpretation of Imago Dei. Therefore it is not surprising that some transhumanists try to develop a transhumanists angle/interpretation of the concept of Imago Dei.

Garner from the School of Theology, University of Auckland, New Zealand (299) perceives the Imago Dei a concept in progress

The concept of *imago Dei* continues to be nuanced by conversations with others both inside and outside the Christian tradition. Within the tradition the *imago Dei* forms a key part of many contemporary liberationist, feminist and ecological conversations. Criticism from outside, such as White's view that Judeo-Christian anthropocentrism being responsible for an ecological crisis, has prompted many to reexamine the concept. And others, such as Lutheran theologian Philip Hefner, look to both culture and genetics to develop an understanding of the image that takes them into account. (299)

Garner perceives the debate around Imago Dei as being a journey from the ***Substantive View to The Relational View to the Functional View when he states:***

In the past one hundred years or so the interpretation of the image has shifted from something that is found inherently in the human person, e.g. reason, through the concept of relationship and to a definition of humans as agents of God within the world. (299)

And perceives this journey to mean

As such it has moved to reinforce the concept that human being is linked to embodiment within the natural world, and with technological agency within that world. (299)

If one looks as how the Irenaean theodicy is described by Hicks a Philosopher of Religion & Theologian wrote (300)

[4] In the light of modern anthropological knowledge some form of two-stage conception of the creation of man has become an almost unavoidable Christian tenet. At the very least we must acknowledge as two distinguishable stages the fashioning of *homo sapiens* as a product of the long evolutionary process, and his sudden or gradual spiritualization as a child of God. But we may well extend the first stage to include the development of man as a rational and responsible person capable of personal relationship with the personal Infinite God who has created him. This first stage of the creative process was, to our anthropomorphic imaginations, easy for divine omnipotence. By an exercise of creative power God caused the physical universe to exist, and in the course of countless ages to bring forth within it organic life, and finally to produce out of organic life personal life; and when man had thus emerged out of the evolution of the forms of organic life, a creature had been made who has the possibility of existing in conscious fellowship with God. But the second stage of the creative process is of a different kind altogether. It cannot be performed by omnipotent power as such. For personal life is essentially free and self-directing. It cannot be perfected by divine fiat, but only through the uncompelled responses and willing co-operation of human individuals in their actions and reactions in the world in which God has placed them. Men

may eventually become the perfected persons whom the New Testament calls "children of God," but they cannot be created ready-made as this. (301)

[6] The picture with which we are working is thus developmental and teleological. Man is in process of becoming the perfected being whom God is seeking to create. However, this is not taking place - it is important to add -- by a natural and inevitable evolution, but through a hazardous adventure in individual freedom. Because this is a pilgrimage within the life of each individual, rather than a racial evolution, the progressive fulfilment of God's purpose does not entail any corresponding progressive improvement in the moral state of the world. There is no doubt a development in man's ethical situation from generation to generation through the building of individual choices into public institutions, but this involves an accumulation of evil as well as of good. It is thus probable that human life was lived on much the same moral plane two thousand years ago or four thousand years ago as it is today. But nevertheless during this period uncounted millions of souls have been through the experience of earthly life, and God's purpose has gradually moved towards its fulfilment within each one of them, rather than within a human aggregate composed of different units in different generations. (301)

and by Hart an Eastern Orthodox theologian (302):

Theologically speaking, the proper destiny of human beings is to be "glorified"—or "divinized"—in Christ by the power of the Holy Spirit, to become "partakers of the divine nature" (II Peter 1:4), to be called "gods" (Psalm 82:6; John 10:34-36). This is the venerable doctrine of "theosis" or "deification," the teaching that—to employ a lapidary formula of great antiquity—"God became man that man might become god": that is to say, in assuming human nature in the incarnation, Christ opened the path to union with the divine nature for all persons

Hart goes on saying:

From the time of the Church Fathers through the high Middle Ages, this understanding of salvation was a commonplace of theology. Admittedly, until recently it had somewhat disappeared from most Western articulations of the faith, but in the East it has always enjoyed a somewhat greater prominence; and it stands at the very center of John Paul's theology of the body. As he writes in *Evangelium Vitae*:

Man is called to a fullness of life which far exceeds the dimensions of his earthly existence, because it consists in sharing the very life of God. The loftiness of this supernatural vocation reveals the greatness and the inestimable value of human life even in its temporal phase.

John Paul's anthropology is what a certain sort of Orthodox theologian might call a "theandric" humanism. "Life in the Spirit," the most impressive of the texts collected in the *Theology of the Body*, is to a large extent an attempt to descry the true form of man by looking to the end towards which he is called, so that the glory of his eschatological horizon, so to speak, might cast its radiance back upon the life he lives *in via* here below.

it is not surprising that transhumanists might see the Irenaean Theocrisy as a way to add a transhumanist angle to the concept of Imago Dei.

As Walker who is at Trinity College, University of Toronto and Department of Philosophy, McMaster University writes

The Irenaean tradition in Christian theology understands humans maturing in terms of self-development. I have argued that it is possible to understand this Irenaean process of self-development in terms of becoming godlike. (251; 303)

Walker moves the "Irenaeanism to its logical conclusion" (303) towards a Neo-Irenaeanism (303).

Walker states:

There is a third and absolutely crucial step in humanity's progression. We must work towards the identity stage: humans must become gods. The reason is manifest: the real problem of evil is not how to justify the existence of evil, but how to eliminate it. For as we noted above, it is not the mere possession of free will that guarantees the production of evil, rather it is free will in

conjunction with our finite nature that leads to the production of moral evil. Thus, it is our duty to attempt to move beyond our merely finite selves, to become gods. When, and only when, we have discharged this duty will evil be expunged, only then will the problem of evil be fully answered.

It may be an exaggeration to say that we are Godlike in comparison to apes, but it is certainly true that we are more godlike than apes. That is, humans possess a better portion of the omniscience, omnipotence, and moral goodness that we attribute to God. If we are more Godlike than apes then it seems incumbent upon us to investigate whether continuing this trajectory of evolution orchestrated by God might not yield an even more Godlike being. After all, there is nothing about our phylogeny that suggests that we are some type of crowning phylogenetic achievement. In evolutionary terms, *Homo sapiens* have only existed for an instant. There is nothing to imply that our level of intelligence, wisdom, potency, or moral goodness could not be usurped by some more evolutionary advanced being.^{i[30]} It seems entirely plausible to assume that if the same sequence of evolution, which resulted in the development of the *Hominid* line from that of *Australopithecine*, were to continue a new species (or perhaps genus) would be formed. Let us term this hypothetical species '*Homo bigheadus*'. *Homo bigheadus*, let us imagine, has a brain of 2200 cc whereas our brains are a mere 1300 cc. This difference of 900 cc of gross brain matter is the same difference as that which separates us from chimpanzees. What might we conjecture about the nature of *Homo Bigheadus*? The familiar correlation between intelligence and the log of brain versus body weight ought to make it a reasonable bet that *Homo Bigheadus* is a lot more intelligent than us.^{ii[31]} With their greater intelligence we would be right to expect that they are more knowledgeable than humans just as humans are more intelligent and knowledgeable than chimps. Furthermore, we ought to predict that *Homo bigheadus* will be wiser, more potent and morally better than humans, just as we are with respect to chimps. Since, as I shall argue in a moment, it is in our power to employ technology to create something like *Homo bigheadus*, we ought to embrace this project. For *Homo bigheadus* will, in all probability, be closer to God, and as developing children of God, this is our next logical step. (303)

This last point is worth emphasizing. Modifying our descendents along the lines described is only the beginning of a process, not the end. If our children become *Homo Bigheadus*—genetically enhanced for greater intelligence and virtue—this marks beginning of the process of becoming identical with God, not the end. *Homo bigheadus* may need to go on to create *Homo Biggerheadus*, and then *Homo Evenbiggerheadus*, etc.^{iii[39]} It would not be beyond the realm of possibility that eventually—after a sufficient number of iterations—we will reach a point where we are intelligent enough to redesign ourselves as purely spiritual beings like God. In any event, our task as scientists, philosophers, theologians, and indeed as Christians, is to examine ourselves and our understanding of God, and do everything in our power to recreate ourselves so as to close the gap on this difference. What better way to honor our Father? (303)

Garner quoting Peters seems to echo the above sentiment.

"Motivated by the potential of a future vision found in Christ, Peters argues that humanity is being drawn forward towards an end. Under this 'evolutionary' pressure morality changes or adapts, making it is wrong to morally place what is delivered to us by nature above how nature can be influenced through technology. In fact, he argues that it is immoral not to strive to make the world a better place through the use of technology, just a morality develops through history bringing about a fairer and more just society. He puts it succinctly when he comments "[t]he situation as it is does not necessarily describe how it ought to be." (299)

However Hart sees irrevocable differences between John Pope II and transhumans when he states:

For the late pope, divine humanity is not something that in a simple sense lies beyond the human; it does not reside in some future, post-human race to which the good of the present must be

offered up; it is instead a glory hidden in the depths of every person, even the least of us—even “defectives” and “morons” and “genetic inferiors,” if you will—waiting to be revealed, a beauty and dignity and power of such magnificence and splendor that, could we see it now, it would move us either to worship or to terror.

The vision of the human that John Paul articulates and the vision of the “transhuman” to which the still nascent technology of genetic manipulation has given rise are divided not by a difference in practical or ethical philosophy, but by an irreconcilable hostility between two religions, two metaphysics, two worlds—at the last, two gods.

This is a pure antithesis. For those who, on the one hand, believe that life is merely an accidental economy of matter that should be weighed by a utilitarian calculus of means and ends and those who, on the other, believe that life is a supernatural gift oriented towards eternal glory, every moment of existence has a different significance and holds a different promise. To the one, a Down syndrome child (for instance) is a genetic scandal, one who should probably be destroyed in the womb as a kind of oblation offered up to the social good and, of course, to some immeasurably remote future; to the other, that same child is potentially (and thus far already) a being so resplendent in his majesty, so mighty, so beautiful that we could scarcely hope to look upon him with the sinful eyes of this life and not be consumed.

It may well be that the human is an epoch, in some sense. The idea of the infinite value of every particular life does not accord with instinct, as far as one can tell, but rather has a history. The ancient triumph of the religion of divine incarnation inaugurated a new vision of man, however fitfully and failingly that vision was obeyed in subsequent centuries. Perhaps this notion of an absolute dignity indwelling every person—this Christian invention or discovery or convention—is now slowly fading from our consciences and will finally be replaced by something more “realistic” (which is to say, something more nihilistic).

Imago Dei versus Species-ism

Though Walker thinks there is a way to use the Imago Dei for transhumanist purposes others believe that at least certain parts of Imago Dei could also “represents a possible point of disjunction with transhumanism”.(299)

“Beyond the obvious disagreement between secular and theistic worldviews that might occur, one of the ethical distinctives noted by some transhumanists is the rejection of *speciesism*. That is, moral status is conveyed not by being a particular biological species, such as *homo sapiens*, but rather by the combination of factors such as individual autonomy and membership in a community. The emphasis upon how privileged humanity is in the scheme of things within the Christian tradition varies but it is unavoidable in one form or another.”(299)

Other issues of contention between Christians and transhumanist according to Garner might be

the orthodox Christian understanding of the human person as an embodied individual raises questions relating to transhumanist aspirations for uploading their understanding of the essence of a person, the intellect or consciousness, into a synthetic environment. In particular the narrative being told here seems to argue for an escapism from the physical.(299) Brenda Brasher raises similar concerns to when she argues that the increasing hybridization of the human person will lead to a time when the non-augmented human will be perceived negatively, redefining the essential nature of human identity and perception.(299)

Garner perceives that

“the main concern with uploading from a Christian social justice perspective comes more from the its intent to reject embodiment. Just as religious fixations with transcending the physical world can

lead to emphasis on saving 'souls' rather than addressing physical need, and also to environmental neglect, so too fascination with uploading might have similar implications."

Imago Dei versus Personhood

The debate around Imago Dei also impacts on the concept of personhood and dignity concepts more contested than many realize and of importance to many groups. Glenn(264) in her paper "Biotechnology at the Margins of Personhood: An Evolving Legal Paradigm" outlines nicely the Legal Roots of Personhood and how the very term 'person' changed over time.

The debate around the concept of personhood will intensify in the future for two reasons

a) Humans, which are not seen as person can be treated differently as different ethics and morality can and are applied to them. This is important in the justification of infanticide (by defining neonatal/newborns as non-persons) many mercy killing cases and it also allow for the sales pitch and justification for genetic and non-genetic intervention such as enhancements/therapies on the level of 'newborn non persons' or any other humans which is defined as a non-person (which in essence could be any human who does not fit personhood criteria as a different ethics could be applied

b) Many new developments such as bionics, cognitive sciences, artificial intelligence, information technology and nanotechnology very likely will lead to new sentient structures which might need the protection of the law which they would achieve by being seen as persons although they might not be humans in the traditional sense anymore.

To quote Peters(166)

Here is what the story of our post-human future—complete with brain-machine interface—looks like to a trans-humanist. At stage one, Artificial Intelligence (AI) researchers will simulate human intelligence in a computer, in a robot. At stage two, humans and machines will merge step by step, replacing portions of our brains with mechanical parts. At stage three, AI researchers will reduce existing human intelligence to a pattern of information processing and download this into a computer or a robot. This will lead to an evolutionary advance, actually a leap forward that could lead to cybernetic immortality—that is, immortal intelligent life in a machine that gets constant backups. Research into computer processing or information processing implants, especially Artificial Intelligence, provides the key to open the door to the post-human future.²² Note the assumptions. First, what makes us human is our intelligence. Second, intelligence consists of information processing. Third, the transfer of the pattern for information processing from our brain to a machine is feasible. In addition, if we keep the machines in perpetual repair, we can live for ever.²³ We will have achieved cybernetic immortality.

One could link the **Substantive View**, the **Relational View** and the **Functional View** of Imago Dei (296) and Erickson answers as to what separates humans from the rest of creation: (a) Humans are relational beings, (b) Humans are rational beings, and (c) Humans exercise volitional will (297) to the understanding of dignity and personhood.

Some principal differences between views would be whether personhood and dignity is individualized or relationship based. And if it is individualized the question arises what the individual needs whether one has dignity and is a person in general or whether the individual has to exhibit certain characteristics such as cognitive awareness and capabilities or certain stage of biological development.

Garner cites Peters for the interpretation of personhood which sees "the value of the individual from being in relationship with others"(299)

"Peters rejects the ideas that our DNA is in some way sacred and that human beings are strictly individuals. Rather he argues that we are individuals in relationship and that those relationships

define human dignity. That is, in practice dignity is experienced as worth or value communicated by relationships. So he says, It is not individualism or identity per se that constitutes a person's dignity. Uniqueness does not determine dignity. Our value as a person comes experientially from the people who love us and, ultimately if not ontologically, from God's love for us. (299)

and cites the executive director of the World Transhumanist Association James Hughes for the interpretation that "personhood is individualistic and based on cognitive abilities". (299)

Garner states:

In Peters' scheme children and adults are ascribed equality of dignity and personhood, while in the other [Hughes] it is possible to interpret a progressive scale of personhood or humanness that alters a person's inherent rights based upon the level of cognitive development. (299)

Garner's interpretation of *Imago Dei* seems to reflect Peters' understanding of personhood.

Within the Christian worldview the doctrine of *imago Dei* might be a helpful starting point for resolving this tension. There the emphasis on the individual as valuable in their own right before God is combined with the sense of obligation toward others because they are also equally valued by God. The human individual is not isolated from the rest of the world, but rather embedded in a range of social and physical relationships, and that need to be recognized. (299)

Harakas (281) in his paper for the Greek Orthodox Archdiocese of America outlines the term person and personhood as follows

"The understanding that each person is created in the image and likeness of God with the personal destiny of achieving theosis implies that each person has an essential and inviolate dignity as a person. The fact that individuals can achieve personhood only in community (*Unus Christianus, nullus Christianus*), requires the concern of the healthy for the ill."

However he does not state clearly what a non person would be. At what level of modification of the human body or generation of sentient beings is one a non person?

When does a Robo Sapien become a Homo sapien and vice versa:

What is a person? A simple question, but one with huge consequences for disabled people and in the end for society at large.

As Ann Forest from Science and Theology News states:

If our robots become embodied, social and capable of reproducing offspring in the near future, will we have to accept them as beings with inherent worth, or as persons? To turn the question around, what is it that makes humans persons? It is the affirmation that other people treat us as persons. They create stories for us and with us; their stories become ours, and our stories become theirs. Stories about one another modify the self-understanding of humans involved, and it seems likely that our own creations might at some point take active part in this exchange. On the other hand, we have to admit that humans are capable of denying other humans personhood for no other reason than their skin color, religion or culture. Humans are good at creating communities that have insiders and outsiders whose status is ambiguous. (304)

Personhood and disabled people

What is a person? A simple question, but one with huge consequences for disabled people and in the end for society at large. All UN based documents use the term 'person'. The United Nations Comprehensive and Integral International Convention to promote and protect the Rights and Dignity of Persons with Disabilities (in preparation) will have to use the term 'person'. Many

existing national Anti disability discrimination laws use the term person. Furthermore nearly any legal protection for human beings in general depends on the term person. Many different definitions can be found on the webpage of the International Centre for Bioethic Culture and Disability(266). I mentioned already Hughes and Peters view on personhood. It is of interest that disability groups such as Disabled people international denounce the link between cognitive abilities and personhood(305) which Hughes and others put forward.

The Dignity Journey: From individual to species to Posthuman

When people talk about human dignity they mostly talk about individual dignity.

Andorno describes that form of dignity as follows(306)

"The basic meaning of dignity, which is the primary and stronger expression of this idea, refers to the intrinsic worthiness of human beings, irrespective of age, sex, physical or mental ability, religion, ethnic or social origin. The word "intrinsic" is used to indicate that such a dignity does not rely on a particular feature or capacity of persons but only on their human condition. This is why dignity cannot be gained or lost, and it does not admit of any degrees. In other words, the idea of dignity refers "to the intrinsic importance of human life"

Another form of dignity relates to a whole species such as the homo sapiens.

Andorno describes that form of dignity as follows.(306)

"The extended meaning of dignity corresponds to a more abstract notion, which relates to the value of humanity as a whole, including future generations. If all human beings have a dignity and should be respected unconditionally, it seems reasonable to affirm that the whole group to which they belong ?humanity? possesses also, in a derivative way, an intrinsic worthiness. This broader concept of dignity covers, on the one hand, the preservation of a sustainable environment for our descendants (a task for environmental ethics) and, on the other hand, the protection of the identity of the human species (a task for biomedical ethics). It is interesting to point out that the Kantian imperative already contains this extended notion of dignity because it literally says that it is humanity in us ("die Menschheit", the human essence) that should never be used only as a means."

The protestant Church of Germany relates in her paper such as "**Im Geist der Liebe mit dem Leben umgehen**" (280) to both forms of identity.

Some believe that there is a qualitative difference in which the secular and the theological world use the term human diversity.

Others such as Guerra Assistant Professor of Theology Assumption College believes that

"human dignity and human autonomy are fused together [within the secular interpretation] to form a perfect circle: Human dignity is seen to require the exercise of human autonomy and the exercise of human autonomy is seen as definitive proof of human dignity". (307)

He believes

"secular understandings of human dignity that are at odds with the animating principles of Catholic social thought. As the Catechism of the Catholic Church repeatedly points out, the dignity of the human person is rooted in the fact that man is created in the image of God.⁵ In addition to describing the theological grounds of human worth, however, the idea of the dignity of the human person is often used within Catholic social thought to describe a moral reality as well. Catholic social thought, in fact, regularly appeals to the inherent dignity of the human person in its articulation of the fundamental moral and political obligations that every legitimate regime must meet. Yet in appealing to the language of human dignity to describe both a metaphysical and a

moral reality, Catholic social thought periodically conflates these two realities. Due to an imprecise use of language, some references to human dignity could suggest that because God has given the human person a privileged position within creation, the human person is the source of moral legitimacy, and this kind of language can be used all-too-easily to justify the conflation of human dignity with radical moral autonomy.” (307)

A recent 2003 number 2 issue of the Journal Concilium, International Journal for theology looked at the Discourse of Human Dignity.

Transhumanist are developing a third form of dignity they call Post Human Dignity.(308)

Bostrom the chair of the board of directors of the World Transhumanist Association and a philosopher at the university of Oxford sees

“two different senses of dignity:

Dignity as moral status, in particular the inalienable right to be treated with a basic level of respect.

Dignity as the quality of being worthy or honorable; worthiness, worth, nobleness, excellence. (The Oxford English Dictionary)(308)

Bostrom believes that

“ on both these definitions, dignity is something that a posthuman could possess”(308)

Bostrom believes (308)

“Transhumanists, see human and posthuman dignity as compatible and complementary. They insist that dignity, in its modern sense, consists in what we are and what we have the potential to become, not in our pedigree or our causal origin. What we are is not a function solely of our DNA but also of our technological and social context. Human nature in this broader sense is dynamic, partially human-made, and improvable. Our current extended phenotypes (and the lives that we lead) are markedly different from those of our hunter-gatherer ancestors. We read and write; we wear clothes; we live in cities; we earn money and buy food from the supermarket; we call people on the telephone, watch television, read newspapers, drive cars, file taxes, vote in national elections; women give birth in hospitals; life-expectancy is three times longer than in the Pleistocene; we know that the Earth is round and that stars are large gas clouds lit from inside by nuclear fusion, and that the universe is approximately 13.7 billion years old and enormously big. In the eyes of a hunter-gatherer, we might already appear “posthuman”. Yet these radical extensions of human capabilities – some of them biological, others external – have not divested us of moral status or dehumanized us in the sense of making us generally unworthy and base. Similarly, should we or our descendants one day succeed in becoming what relative to current standards we may refer to as posthuman, this need not entail a loss dignity either.

From the transhumanist standpoint, there is no need to behave as if there were a deep moral difference between technological and other means of enhancing human lives. By defending posthuman dignity we promote a more inclusive and humane ethics, one that will embrace future technologically modified people as well as humans of the contemporary kind. We also remove a distortive double standard from the field of our moral vision, allowing us to perceive more clearly the opportunities that exist for further human progress.”

Nothing can be found so far by WCC members which looks at the theological implications of the concept of posthuman dignity and how it impacts on the species and individualized dignity used by WCC members.(280)

Issues for theology, religion, faith and Churches III: The concept of responsibility

I outline in the secular section the concept of responsibility. In short many see the usage of genetic and non genetic screening and genetic/non genetic therapy to ensure an as ‘healthy’ a homo

sapiens child as possible as a parental responsibility (238;270).The statement by the Russian Orthodox Church(294) does see the issue of responsibility in a different light.

"The Ambiguous are also the methods of prenatal diagnostics making it possible to identify a genetic illness on the early stages of the intrauterine development. Some of these methods may present a threat to the life and integrity of the embryo or foetus under test. The detection of an incurable or severe genetic illness sometimes compels parents to interrupt the life conceived; there have been cases of pressure brought to bear upon them to this end. Prenatal diagnostics may be viewed as morally justifiable if its aim is to treat an illness detected on an earliest possible stage and to prepare parents for taking special care of a sick child. Every person has the right to life, love, and care, whatever illnesses he may have. According to Holy Scriptures, God Himself is 'a God of the afflicted' (Judith 9: 11). St. Paul teaches 'to support the weak' (Acts 20: 35; 1 Thes. 5: 14). Likening the Church to the human body, he points out that 'much more those members of the body, which seem to be more feeble, are necessary', while those less perfect need 'more abundant honour' (1 Cor. 12: 22, 24). It is absolutely inadmissible to use methods of prenatal diagnostics with the aim to choose a more desirable gender of a future child. "

However it is interesting to note that they are much clearer in their condemnation of sex selection than ability selection/impairment deselection.

In a statement from the Holy Synod of the Church of Greece Bioethics Committee (309) one reads

"The Orthodox Church understands this inability and observes progress with prudence and a sense of responsibility and calls for our attention so that the human genome be protected in every possible way from all kinds of interests and profits, financial exploitation, eugenic orientation and arrogant dominance. The genome by itself does not give value to man, neither does the achievement of its decoding; rather, it is man who gives value to his genome."

Unfortunately the statement does not define what it means with the term 'eugenic orientation'. However the last sentence in the statement

"Perhaps, genetic prevention is ultimately better than gene therapy." (309)

opens up the possibility that the Church of Greece or at least the Bioethics Committee is in sync with parts of the transhumanist interpretation of responsibility.

As are certain phrases of the paper "Orthodox tradition, bioethical principles and European integration"(310)

"The first set of questions refers to the notion of human rights. The very idea of human rights arguably rests on what it means to be human, on a reverence for life and for autonomy, on the need of the individual to remain master of his/her body" (310)

It is interesting that Ismini Kriari links human rights to the concept of mastery about ones body. To remain master of his/her body can easily be interpreted as supporting the right to be a consumer for transhumanist interventions. This linkage as outlined by Ismini Kriari needs careful thought.

In the 'Declaration of Bioethical Principles based on the Orthodox tradition'(311) adopted in 2002 by the 9th Conference of the Interparliamentary Assembly of Orthodoxy one reads among others

"9a. Respect for time. While our knowledge is very limited we proceed to decisive steps that bring immediate consequences. We should not move to applications involving human cloning and the in-vivo alteration of the human genetic material, before we acquire all the necessary knowledge regarding these processes.

9b. Respect for God's creation. Knowledge and curiosity are so essentially and deeply bound with the nature of man, that the danger of not limiting ourselves to therapeutic applications but proceed to the correction of what some may regard as "natural imperfections" is apparent. Consequently, along with gene therapy approaches, we may also provoke disastrous changes in human social conduct and relationships leading, perhaps, to genetic discrimination. Scientists must use their knowledge with discretion and prudence without preconception and short-sighted vision. In addition, they must not forget that they are part of nature and not its ruler.

9c. Respect for human variability, "imperfections" and disabilities. The possibility to intervene in the quality and shape of our characteristics for reasons other than diagnostic, preventive or therapeutic opens the way to a society characterized by genetic discriminations, racism and eugenics; a society in which there will be room only for healthy and strong people, people with predetermined specifications. Societies should consider among their priorities not only research but also the protection of human variability and the amelioration of the conditions of the disabled. It is the responsibility of every religious, political, scientific and social carrier towards future generations to take all measures, so that man is not downgraded to a financial figure, a genetic parameter or a deterministic unit, and to avoid every form of racist discrimination of a eugenic character. At the same time, we will all work together so that priority be given to preserving human dignity over any kind of research goals and achievements as well as for the confidentiality of genetic and personal information.

The potential provided by biomedical progress and, more specifically, by genetic engineering and new reproductive approaches requires that the human genome and technological advancements in assisted reproduction be protected by all means from any form of self-interest, financial exploitation, eugenic orientation and arrogant domination.

9d. Respect for human life from its conception until the moment of death. Every political resolution or legislative adjustment which refers to matters of biomedicine, medical technology, biotechnology and genetic engineering should necessarily respect the fact that every human being from his/her conception until his/her last breath constitutes a unique irreplaceable and unrepeatable being, that has by nature free will, is sacred and transcendental in his/her essence and perspective, and forms a social entity with rights and obligations.

11. Responsibility towards future generations requires special attention with regard to the approval of germ-line therapy methods that will be passing on their effect to the descendants of the persons undergoing the therapy. At the same time, all forms of discriminatory treatment of individuals suffering from any kind of health problems should be excluded. Finally, the genetic identity of the individual should be protected with regards to interventions that do not have a diagnostic or therapeutic character or do not aim to prevent a disease."

The wording of the declaration is interesting in many respects. Point 9a seems not to rule out the allowance of human cloning and the in vivo alteration of the human genome at least if one assumes that we have gained eventually enough knowledge. In the same way point 11 does not ask for the prohibition of germ-line therapy. Point 9b identifies the reality that one might move beyond therapeutic interventions however it does not ask for a prohibition of that move.

Point 9c seems to be inconsistent. It states "Respect for human variability, "imperfections" and disabilities. The possibility to intervene in the quality and shape of our characteristics for reasons other than diagnostic, preventive or therapeutic opens the way to a society characterized by genetic discriminations, racism and eugenics; a society in which there will be room only for healthy and strong people, people with predetermined specifications. Societies should consider among their priorities not only research but also the protection of human variability and the amelioration of the conditions of the disabled." However the intervention "in the quality and shape of our characteristics" through 'diagnostic, preventive or therapeutic' seems to allow for eugenic measures and the wording of 9c seems to be in conflict with the demand voiced elsewhere in 9c to protect human variability "imperfections" and disabilities.

Point 9c is also problematic due to its non defined usage of the terms 'disability' and 'disabled'.

When it talks about the 'amelioration of the conditions of the disabled' what is meant by it? Is the

dismally social situation of disabled people mend or the 'medical health' mend. To state 'respect for disability' seems also be strange. Is mend here that one should respect the variability of functioning and/or bodystructure of disabled people? If the answer is yes one has to question the language of point 9c which seems to blanket approval of therapeutic and preventive interventions. I assume that in this context disability does not mean social problems of disabled people because I can't see how they could ask for the respect of the social problems of disabled people. However what 9c highlights is the medical understanding and usage of the term disability and the need for a much more differentiated usage of the terms disability and disabled as outlined earlier in this paper in the section of secular views on health and disability and the theological vies on health and disability

Issues for theology, religion, faith and Churches IV: A transhumanist view on 'God's Children'

Another issue of interest is how secular groups deal with the concept of God's Children. I quote below how a transhumanist incorporates the theological concept of God's Children
Luke 20:35-37

35 But those who are considered worthy of taking part in that age and in the resurrection from the dead will neither marry nor be given in marriage, 36and they can no longer die; for they are like the angels. They are God's children, since they are children of the resurrection. 37But in the account of the bush, even Moses showed that the dead rise, for he calls the Lord 'the God of Abraham, and the God of Isaac, and the God of Jacob.'[a]

Romans 8:15-17

15For you did not receive a spirit that makes you a slave again to fear, but you received the Spirit of sonship.[a] And by him we cry, "Abba,[b] Father." 16The Spirit himself testifies with our spirit that we are God's children. 17Now if we are children, then we are heirs—heirs of God and co-heirs with Christ, if indeed we share in his sufferings in order that we may also share in his glory

into their understanding of responsibility.(251)

"God's children" seems open to multiple developments, and so it is extraordinary that this notion has not received more critical scrutiny. One way to understand it is in terms of the same parent/child relation we are familiar with between adult humans and human children: we are God's children in exactly the same way that we are the parents of our children. To think about it in such literal terms is quite startling. For then it seems that we might one day grow up and become like our Father, just as we expect that our children will become like us in time. In other words, taken literally, this idea implies that upon maturity we too should be gods. Pursuing this line of inquiry quickly puts the question of transhumanism at the fore, since, as we have said, transhumanism offers the possibility of improving our intellectual and moral natures. If we are to grow up and become like our Father then why shouldn't we side with the transhumanist means of achieving this end, i.e., using technology to make ourselves more godlike?

This seems to me to be a perfectly consistent transhumanism-religious hybrid: it draws from transhumanism the idea that we can use technology to improve ourselves, from religion it draws the idea that part of our maturation process to becoming like our Father is to take responsibility for our own development. The parallel with developing human children is quite obvious: one aspect of successfully raising children to adulthood means helping them to eventually take responsibility for their own development. Obviously people do not cease to develop upon reaching adulthood. As young adults, our children make many decisions about their future development: their education, their career, the person they might want to have as a partner in creating their own family, and so on. Analogously, a Transhumanist theology sees us as entering a stage of young adulthood, one where we take responsibility for our further development towards becoming like our Father.

Issues for theology, religion, faith and Churches V: Playing God versus co creator. Synthetic biology and other emerging technologies.

In terms of intent the term 'Playing God' can mean to use 'Godlike' powers" to replace God or compete with God or work with God.

In terms of action the term 'Playing God' can mean that one tries to mimic Gods actions by altering non human life and evolution and non life matters on earth and elsewhere in general and human life and evolution in particular.

CoCreators , Creatio Continua and synthetic biology

A recent backgroundpaper for the Ecumenical Conversations of the 9th World Assembly of the World Council of Churches one reads (sent to me by e-mal on the 22nd of December 2005) asserts the validity of the creatio continua concept :

Called to be co-workers with God

The world is God's creation, and it belongs to God. Humanity has the mark of God's image and is called to grow into God's likeness (Genesis 1:26).

By God's grace the whole of creation is sustained, transformed, transfigured and brought into unity. By grace, God has the initiative in all things. However, the new humanity in Christ, renewed, regenerated and transformed by God's grace, is commissioned to take part in God's healing and transformation of the world (1 Cor. 3:9).

By God's grace, the world is being called to transformation, healing and reconciliation, but the ministry of proclamation remains our responsibility (Colossians 1:23). The *martyria*, *leitourgia*, *koinonia* and *diakonia* of the church become, therefore, synergic acts by which Christians, with full accord and commitment, implement in mission, prayer and action the work of God's grace in their lives for the transformation of the world.

For such theological reasons, the theme of the Assembly is in the form of a prayer. We are persuaded to give up any arrogant expectations based on the premise that with our force and skills alone the world can be changed and transformed. In most cases, history proves the contrary. The world continues to be in bad shape and many Christians continue to act accordingly even after two thousand years of Christianity. Therefore, the theme of the Assembly is an invitation to reflection, metanoia and transformation. We are first called to recognize and affirm God's initiative and work in all, and to pray in support of it. At the same time, we are urged to a personal response to God's initiative and to act according to our new humanity renewed by grace, as fellow citizens with Christ and co-workers with God. Seen through the eyes of faith, this world can and must be transformed: from unjust to more just relationships, from environmental destruction to care for creation, from a world marked by the deadly consequences of sin to a world open to receive life out of the hands of God.

"Another world is possible" was the motto of those who gathered in Porto Alegre for the World Social Forum in resistance to neo-liberal economic globalization and engaged in the struggle for alternatives. Christians have even more reasons to resist fatalism and to say:

God created the world and will never stop caring for it (Genesis 1-2). Christ shared the suffering of a world groaning for liberation (Romans 8) in his death on the cross. "Christ is risen. He is risen indeed" – the joy of Easter is an expression of the yearning and hope that the chains of sin and death will be broken for all human beings and all creation (Colossians 1:15ff.). The creative, reconciling and healing power of the Holy Spirit continues to transform the world as the breath of God's love (agape), which is God's transforming power of grace (Romans 8-11).

Remembering that all life is created by God and that God continues to care for it, we affirm the sacredness of all life and receive God's gift of life that we share with all other creatures and all creation. The earth is not ours, but God's common home for all who are connected within the web of life, the earth community (Psalm 24:104). It is not we who sustain life, but God. All our human power must be accountable to God. All human activities must recognize and respect the logic and rules (ecology and economy) of God's greater household of life (oikoumene) in just and sustainable relationships that make for peace and the flourishing of communities.

Daly outlines in his paper that several theological schools exist which allow for a contribution by humans, as free co-creators. (1 Cor. 3,9)(283) and he describes how many of the early life extension initiatives come from Christian thinkers.(283)

"Thus humans can become tools, i.e. agents, in God's hands, so to speak, in such exceptional steps ("creatio continua "). (Jn 5:17). It is apparent that not only great personalities in the history of the Church felt that there is such role, but other creative people of influence were also driven by a God given "mission" to change something in our social and material environment, to the better." (283)

Daly quotes Cole-Turner :

"three affirmations of general agreement among theologians: (1) creation is an evolutionary process where God is continually active, (2) God's omnipresence continuously affects creation at every level, and (3) creation's future is still uncertain—God has not guaranteed its outcome. Together, these affirmations comprise what he terms *creatio continua*, a 'continuous creation,' defined as "a divine action of influencing, of working through, of calling forth, and of offering new possibilities to all creatures." The primary question for humanity is to figure out to what extent, through our understanding and technological abilities, will we serve God the creator in this ongoing creative creativity. Here, he introduces his second tenet entitled co-creation. "Human work, especially our technology," asserts Cole-Turner, "may be seen as a partnership with God in the continuing work of creation." (283)

In the Yahwist account (breathes the dynamism of life into the formed clay (v. 7). The Creator places Adam in the garden with Gen. 2:4b ff.), a comparable two-fold relationship is suggested. God creates Adam from the dust, then the command "to till it and to keep it" (v. 15). Here, unlike the priestly account, Adam is created before the animals or even the vegetation. The reasons given are that there is no rain and no human yet exists to till the ground, suggesting that the very existence of vegetation depends in part on the human effort of agriculture. After the banishment from Eden (Gen. 3), agriculture continues even though under more difficult circumstances. The importance of agriculture through chapters 2 and 3 suggests that it is a major theme of the text, although rarely treated in the history of its interpretation. (312)

According to Cole the report prepared by the Panel on Bioethical Concerns of the National Council of Churches of Christ (USA) and published as *Genetic Engineering: Social and Ethical Consequence in 1984* "speaks of God's continuing creation and of our human role in that creative process" (312) He goes on stating:

" Referring to the "dominion" mentioned in Genesis and in Psalm 8, the report identifies this with our working with God in the continuing work of creation. "Dominion carries with it a concept of custody, of stewardship, of being responsible for, of caring for all creation. Therefore, we are called to live in harmony with all creation, including humankind, and to participate with the Creator in the fulfillment of creation." This leads to the term "co-creation" to describe our role. While the report endorses this term, it does so with caution: "The language of co-creation must be used with care." It is not clear what reservations the panel had with this term. The overall flow of the document clearly supports it, claiming that Scripture "exalts the idea that men and women are coming into the full exercise of their given powers of co-creation." But while any reservations the panel may have had about "co-creation" are not stated, neither is there anything said affirmatively about what this term might mean. Quite obviously, such a term is crucial to our understanding the theological significance of the emerging technology." (283)

According to Dale

"Cole-Turner derives theological warrant for using genetic technology not only for the cure of disease, but, as we have seen, for 'new dimensions of existence' through the notions of co-creatorship and *creatio continua*, where we act as co-participants in God's ongoing redemptive and creative work in the world. Though God does indeed work through natural processes, God can also work through genetic engineering, so long as such activity fits within God's redemptive plan for the universe in the renewal of all things. "(283)

It was Christ who took on flesh, becoming a man in a finite body and succumbing to death on a cross—even as he healed the sick and occasionally brought the dead back to life—whose life affirms the inherent goodness of embodiment and the finitude this entails. Moreover, the fact that Jesus rose bodily that we too might receive a resurrection body suggests that the use of technology to transcend our limitedness in time by slowing aging itself is misguided. Thus, from a Christian perspective, any distinguishing between human and post-human is best put in terms of human embodiment, as understood in the person of Jesus Christ, and our desire to transcend the limits that our body pose, most notably the limit of time. Indeed, one key difference between Christian theology and transhumanist philosophy is the moral or normative force of embodiment as a key criterion for humanness.(283)

Daly believes that although there are at least three areas of commonality between transhumanists and Christians : " death as an enemy, a dissatisfaction with our current human condition, and the idea of nature as a process"(283) the tools to reach the end are different.

"Thus, our hope for defeating death is not to be found through the use of technology, but in the person of Christ, who meets us beyond the limit of our death and holds us embodied in relationship to himself. "(283)

Daly concludes his article about life extension in the following way

I wish to conclude this article by offering one possible response to the idea of killing off the dragon of aging and death. I find it interesting that Bostrom chose the tyrant as the image of aging and death, for when we consider death's indiscriminately cruel and unabated visitation upon all, irrespective of one's health, social, or moral standing, it is easy to see why the tyrant metaphor encompasses so much of what we hate and fear about death. We have already made aging and death a tyrant. However, one wonders if Bostrom and transhumanist philosophy has not made *life* a tyrant. It was this notion of 'life at all cost,' life as an 'ethical lord' that Barth found so troubling, countering that "in theological ethics the concept of *life* cannot be given this tyrannical, totalitarian function." Barth was essentially arguing that since life was a gift on loan from God, a proper expression of appreciation involved the acceptance one's bodily limits, or even laying down one's life for another as the ultimate sacrifice of offering one's life back to the One who gave it. Again, the basis for such behavior was determined by the person of Jesus Christ, who is the standard by which all human thought and action is to be judged. The most obvious retort would be that making *life* one's lord is certainly better than making *death* one's lord. Yet, if death means non-existence, a permanent end to our personal history, then one wonders, given all of the suffering in this world, whether non-existence would be preferable to a miserable one.(283)

Daly goes down here a very dangerous path. Because the judgment of others of what is life worth living or where life is a tyrant is at the roots of one of the biggest schism disabled people have with so called non-disabled people.

Perception of disabled people

Public perception of disabled people follows mostly the patient/medical model/medical determinant type, sometimes the patient/medical model/social determinant type, and very rarely the social model/social health/social determinant/social well-being type. The patient/health

consumer/transhumanist model/transhumanist determinant type is slowly appearing in some circles.

Disabled people are normally perceived as having a low quality of life, as being subnormal, as being people with a medical deficiency, and as being patients. The term “disabled” is mostly used to describe a person who is perceived as having an intrinsic defect, an impairment, disease, or chronic illness leading to subnormal functioning and expectation. Suffering, in the preceding understanding of disabilities, impairments, diseases, and defects, describes the situation of having to live in an undesirable (subnormal) state of existence and is linked to the perception that society will never support and accept disabled people with their variation of being. (313)

A Nike advertisement from 2000 reflects such a view:

Fortunately the Air Dri-Goat features a patented goat-like outer sole for increased traction so you can taunt mortal injury without actually experiencing it. Right about now you're probably asking yourself 'How can a trail running shoe with an outer sole designed like a goat's hoof help me avoid compressing my spinal cord into a Slinky on the side of some unsuspecting conifer, thereby rendering me a drooling, misshapen non-extreme-trail-running husk of my former self, forced to roam the earth in a motorized wheelchair with my name embossed on one of those cute little license plates you get at carnivals or state fairs, fastened to the back?(314)'

The quote from “The History of Thalidomide” by Stephens and Brynner adds the claim that disabled people destroy the quality of life of so-called non-disabled people:

How did parents endure the shock [of the birth of a thalidomide baby]? The few who made it through without enormous collateral damage to their lives had to summon up the same enormous reserves of courage and devotion that are necessary to all parents of children with special needs and disabilities; then, perhaps, they needed still more courage, because of the special, peculiar horror that the sight of their children produced in even the most compassionate. Society does not reward such courage...because those parents' experience represents our own worst nightmare, ever since we first imagined becoming parents ourselves. The impact upon the brothers and sisters of the newborn was no less horrific. This was the defining ordeal of their family life – leaving aside for now the crushing burden on their financial resources from now on. (315)

A clash of perceptions and values

The literature shows that people with different experiences and perspectives (disabled versus so-called non-disabled) perceive the same condition differently. One study, performed in 1994 at the Craig Hospital in Englewood, Colorado, asked a set of questions about disability to people with a spinal cord injury (SCI; n = 168) and non-disabled people working in the intensive care unit (ICU) of the hospital (n = 233). The non-disabled workers were asked to answer the questions as they related to their real being and also to envision themselves as having an SCI. The study showed that the self-rating between the disabled and non-disabled is not that much different, but there is quite a discrepancy between imaging oneself with a disability versus having one (Table 13).

Table: Self-esteem ratings following severe spinal cord injury (SCI)⁽³¹⁶⁾

| No disabled providers self-rating | No disabled providers imagining self with SCI | SCI survivors | <i>Comparison group</i> |
|--------------------------------------|--|---------------|-------------------------|
| % Agreeing with the statement | | | |

| | | | |
|---|----|----|----|
| I feel that I am a person of worth | 98 | 55 | 95 |
| I feel that I have a number of good qualities | 98 | 81 | 98 |
| I take a positive attitude | 96 | 57 | 91 |
| I am satisfied with myself on the whole | 95 | 39 | 72 |
| I am inclined to feel that I am a failure | 5 | 27 | 9 |
| I feel that I do not have much to be proud of | 6 | 33 | 12 |
| I feel useless at times | 50 | 91 | 73 |
| At times I feel I am no good at all | 26 | 83 | 39 |

Indeed, those with a "condition" very often perceive it as less serious than do those without the "condition" and many studies show how disabled people rate their own quality of life as equal to, or higher than, their non-disabled counterparts. (40; 317-339) The medical model seems to be in contradiction to the fact that many disabled people do not see themselves as having a medical condition.. Most disabled people, whether they have spina bifida, achondroplasia, Down syndrome, or other mobility and sensory differences, perceive themselves as healthy (in the medical sense), not sick. They describe their "conditions" as givens of their lives, the equipment with which they meet the world. They do not perceive themselves as "subnormal." For example, in the case of the characteristic spina bifida, it seems to be a forgone conclusion that spina bifida is a medical condition in need of prevention through, for example, the use of a folic acid supplement in the mother's diet. But one of the resolutions of the 12th International Conference for Hydrocephalus and Spina Bifida in Toulouse, 2000, states that: "people with spina bifida and hydrocephalus live a full life with equal value to that of any other citizen and they should not be seen as a medical condition. Their views should be sought and heard by Governments and Health professionals, who should acknowledge the right of people with spina bifida and hydrocephalus to speak for themselves." (340) At the 8th working meeting of the UNESCO International Bioethics Committee, the group Inclusion International (a group representing people with Down syndrome and their parents and friends) was listed as a "patient" group. Inclusion International denounced this description, as they do not see people with Down syndrome as patients per se and they see Inclusion International as a human rights group, not a patient group (personal communication).

The Canadian Down Syndrome Society states:

Down syndrome is a naturally occurring chromosomal arrangement that has always been a part of the human condition. The occurrence of Down syndrome is universal across racial and gender lines, and it is present in approximately one in 800 births in Canada. Down syndrome is not a disease, disorder, defect or medical condition. It is inappropriate and offensive to refer to people with Down syndrome as "afflicted with" or "suffering from" it. Down syndrome itself does not require either treatment or prevention. The sole characteristic shared by all persons with Down syndrome is the presence of extra genetic material associated with the 21st chromosome. (341)

The same is true for people with chronic conditions such as cystic fibrosis, diabetes, hemophilia, and muscular dystrophy. These conditions include intermittent flare-ups requiring medical care and adjustments in daily living, but they do not render a person unhealthy, as most of the public and members of the health profession imagine. (342) Furthermore, the notion that disabled people

destroy families, as reflected in the Stephens and Brynner quote and elsewhere, (343-357) is refuted in many academic studies. (40; 358-395)

An area where that clash of perception plays itself out is the QALY. QALY indicators are seen as critical outcome measures in cost-effectiveness, cost-utility, and other evaluation tools used to generate economic evaluation evidence. (396), (397)

How can a QALY work if the perception of disabled people and the self-perception of disabled people often do not match and if disabled people perceive their quality of life as being higher than the quality of their life is perceived by non-disabled people?

This problem is recognized by others, such as Nord, who states:

The desirability of a condition to people who are not in it themselves is only moderately correlated to the experienced well-being of people with the condition and hardly correlated at all to the worth of those people. (398)

Nord concludes from this reality:

A single score for a health state, of the kind used in QALY calculations, cannot express all these three types of value...one needs to distinguish between the desirability of a condition to people who are not in it themselves (ex ante judgments), the experienced well-being of people with the condition (ex post judgments), and the worth of those people. (398)

Nord points out another truth, long claimed by disabled people, that being medically healthier does not mean that one feels less miserable and more valuable, (398) and if one is less "medical healthy," one does not necessarily feel less valuable and more miserable. This report provided an example in the table "Self Esteem Ratings following severe Spinal Cord Injury (SCI)." (316) Nord provides the following example (399): "Take a person in a wheelchair. His condition is to most people highly undesirable compared to being in full health. (396; 398) But his subjective well-being, i.e. his mood or inner feeling of happiness, may be comparable to that of non-disabled people." (396; 398), Nord concludes: "In QALY-calculations the distinction seems to have been completely disregarded, if not explicitly rejected." (396; 398)

As troubling as the fact is that there is this difference in perception between the "afflicted" and the "non-afflicted," even more troubling is the fact that the non-afflicted for the most part do not accept the self-perception of the afflicted if the self-perception does not fit the agenda of the non-afflicted. The views of disabled people and their families (the afflicted, the experts) who do not see themselves within the patient/medical model are rarely heard or blatantly ignored—a fact that was recognized in the final documents of the 1999 UNESCO World Conference on Sciences (400; 401),—seen as irrelevant, (402) or even actively questioned and rejected, (270; 403-407), in the shaping of the research agenda, government policies, and public debate and education, as they relate to the development and use of science and technology and health research and HTA. (40; 163; 408-410)

Issues for theology, religion, faith and Churches VI: Cognocentrism versus the Soul

Cognitive Sciences and the vision of many transhumanist to be able to upload their consciousness into something else than the homo sapiens body raises a variety of questions. Most article look at the consequences around uploading ones consciousness into a non biological based framework leading to a variety of questions related to person hood, Robo-sapiens cognocentrism as a means to define rights and others. Other questions normally not discussed relate to the possibility that one could upload ones consciousness into other biological matters such as animals and plants which should be feasible if one is able to transfer consciousness into non biological matters. It also has certain theological implications if one reads

Daniel 4: 15-17 (The Message)

15But leave the stump and roots in the ground, belted with a strap of iron and bronze in the grassy meadow. Let him be soaked in heaven's dew and take his meals with the animals that graze.
16Let him lose his mind and get an animal's mind in exchange, And let this go on for seven seasons.
17The angels announce this decree, the holy watchmen bring this sentence, So that everyone living will know that the High God rules human kingdoms. He arranges kingdom affairs however he wishes, and makes leaders out of losers.

The secular issues are dealt with in different parts of the paper.

However there are also theological implications in regards to the efforts to separate consciousness from the homo sapiens body one being its impact on the concepts of soul and mind. Indeed there is a long history of tension between neuroscientists and theological concepts of the soul. This paper showed in many areas the impact of transhumanism on theological concepts. Separating ones 'soul' ones consciousness from the homo sapiens body the 'biological vessel' (uploading the mind) s one goal one vision of many transhumanists. It is easy to see that this vision this goal of 'cybernetic immortality' (298 Google hits) and the transhumanist vision of a post-human must have an impact on the theological concept of the soul and mind.

It is interesting how the incident of usage of the terms soul and mind is different in different translation versions of the bible.

Often Soul is replaced by the term 'life' or the term 'real you' or spirit

Mark 8:36-38 (New International Version)

36What good is it for a man to gain the whole world, yet forfeit his soul? 37Or what can a man give in exchange for his soul? 38If anyone is ashamed of me and my words in this adulterous and sinful generation, the Son of Man will be ashamed of him when he comes in his Father's glory with the holy angels."

Mark 8:36-38 (Worldwide English (New Testament))

36What good will it do a man if he gets the whole world for himself but loses his soul?
37-38 what can a person give to get back his soul? People have gone away from God and are full of wrong ways. If anyone in this time is ashamed of me and the things I say, the Son of Man also will be ashamed of that person when he comes. The Son of Man will come with his holy angels, and be great like his Father.'

Mark 8:36-38 (Holman Christian Standard Bible)

36For what does it benefit (A) a man to gain (B) the whole world (C) yet lose (D) his life? (E)
37What can a man give in exchange for his life? (F) 38For whoever is ashamed (G) of Me and of My words (H) in this adulterous and sinful (I) generation, (J) the Son of Man will also be ashamed of him when He comes in the glory (K) of His Father (L) with the holy (M) angels." (N)

Mark 8:36-38 (The Message)

36What good would it do to get everything you want and lose you, the real you?
37What could you ever trade your soul for?
38"If any of you are embarrassed over me and the way I'm leading you when you get around your fickle and unfocused friends, know that you'll be an even greater embarrassment to the Son of Man when he arrives in all the splendor of God, his Father, with an army of the holy angels."

Mark 8:36-38 (Amplified Bible)

36For what does it profit a man to gain the whole world, and forfeit his life [[a]in the eternal kingdom of God]?
37For what can a man give as an exchange ([b]a compensation, a ransom, in return) for his [blessed] life [[c]in the eternal kingdom of God]?

38For whoever [d]is ashamed [here and now] of Me and My words in this adulterous (unfaithful) and [preeminently] sinful generation, of him will the Son of Man also be ashamed when He comes in the glory (splendor and majesty) of His Father with the holy angels.

Mark 8: 36-38 (Contemporary English Version)

36What will you gain, if you own the whole world but destroy yourself? 37What could you give to get back your soul?

38Don't be ashamed of me and my message among these unfaithful and sinful people! If you are, the Son of Man will be ashamed of you when he comes in the glory of his Father with the holy angels

Job 6: 4 (Contemporary English Version)

4The fearsome arrows of God All-Powerful have filled my soul with their poison.

Job 6: 4 (Revised Standard Version)

4: For the arrows of the Almighty are in me; my spirit drinks their poison; the terrors of God are arrayed against me.

Job 6: 4 (Holman Christian Standard Bible)

4 Surely the arrows of the Almighty have pierced [a] me; my spirit drinks their poison. God's terrors are arrayed against me. (A)

Job 6: 4 (The Message)

4The arrows of God Almighty are in me, poison arrows--and I'm poisoned all through! God has dumped the whole works on me.

Job 6: 4 (King James Version)

4For the arrows of the Almighty are within me, the poison whereof drinketh up my spirit: the terrors of God do set themselves in array against me.

The term conscious/ness does not show up much less and is use in the sense of being aware of something going on

| | New International Version | King James Version | New King James Version/21 st Century King James Version | Holman Christian Standard Version | Worldwide English New Testament | Amplified Bible | The Message | Contemporary English Version/ New Life Version | Revised Standard Version |
|------------------------|---------------------------|--------------------|--|-----------------------------------|---------------------------------|-----------------|-------------|--|--------------------------|
| Soul | 158 | 498 | 341/501 | 58 | 12 | 190 | 167 | 26/224 | 339 |
| Mind | 156 | 132 | 131/128 | 171 | 83 | 344 | 196 | /171 | 312 |
| Conscious/Consciouness | 0/0 | 0/0 | 2/21/1 | 4/1 | 0 | 24/8 | 0 | 0 | 1/1 |
| | | | | | | | | | |

According to Rabbi Naamah Kelman(411)

“creation is both the original act of the creation of the world, and the ongoing idea of renewal; renewal of the soul and renewal of the world”

Cardinal Camillo Ruini(412) in a 2004 interview answered "For the ancients, the problem seemed to be the soul. For the moderns, it is the body. If this is so, why such a profound change?" as follows

"Cardinal Ruini: I would hesitate greatly before accepting such a categorical and global alternative. Limiting ourselves to Western civilization, in each one of its great phases it seems that interest is clearly present in each of these two alternatives, [...] "body" and "soul."

The denial of the reality proper to the soul, that is, its reduction to the body, was already explicitly theorized by important philosophical schools of antiquity. In the same way, among scientists of our day, there is no lack of those who show themselves to be openly skeptical to the idea of reducing the mind to the brain. The weakening of interest in the soul is linked, without a doubt, to the so-called end of metaphysics, especially in the form that this end took with Nietzsche and those after him. It can be read as the ultimate expression and legitimization of narrow-mindedness in regard to what is relative, in what can be experienced"

Q: Some say that two possibilities are opening before us. The first leads to giving up the soul because of the naturalist scientific spirit that reduces the soul to the mind and the latter to the brain. The other wishes to take up again the path of rediscovery of the soul and its dwellings, overcoming the objection that anthropology and psychology are two branches of natural science. In your opinion, which is the prevailing way?

Specifically, the technologies are appropriating the totality of our body, including the brain, and of the generation of our being, namely, human procreation.

The modifications of our mental states induced by pharmacology and the extraordinary possibilities of artificial intelligence seem to offer a new and effective support and almost a definitive confirmation, apparently scientific, to "philosophies of the mind" that, taking up again former hypotheses, believe that they can reduce our intelligence and our freedom to the functioning of the brain, which in turn can be equated or surpassed through the development of artificial sciences.

This situation, however, must not be considered as irreversible. A rigorous analysis of the characteristics of our intelligence and freedom, of its ways of acting and the results it achieves, can show the problems its reduction to the brain imply.

On the other hand, a more specific analysis of so-called artificial intelligence indicates that the latter, in the end, is not really "thought," but simply a simulation of our intelligence, realized in virtue of what we know of ourselves, as Alberto Oliverio has observed.

The emergence of the present "anthropological question" now calls, precisely, for a new effort from theological thought to demonstrate that life after death is credible and also to address in a global way the anthropological problems, so that the promise of eternal life will not seem something foreign and in the end incompatible with our concrete reality.

The Interdisciplinary Encyclopedia of Religion and Science(413) states

"Lutheran theologian Wolfhart Pannenberg, have put forward what might be termed an "actualist" or dynamic understanding of what has traditionally be called the human soul (cf. Pannenberg, 1998). According to the latter the "separated soul" after death should not be considered as a subsistent being as such; rather the individual human being would as it were be "retained" in the mind of God during the intermediate period between death and final resurrection. At the consummation of time the person would receive definitive fullness and immortality as a kind of new creation.

Pannenberg takes it that modern science has demonstrated that the "soul" is not an object as such, but rather an aspect of the dynamism of life and of human behaviour. Hence it would make no sense to speak of the immortality "of" the soul. Besides, he notes that Christian hope is founded on the notion of novelty , and not on that of stability and continuity. Pannenberg admits however that Christian theology has historically accepted the notion of the subsistence and survival of the soul as

a vital principle, for reasons not necessarily bound up with an uncritical assimilation of Platonism. The doctrine in fact is closely related to salvation and resurrection, and was put forward in order to ensure that human identity between the earthly and risen state is maintained. The so-called "immortality of the soul" is what made it possible for resurrection to take place; the "soul" as *forma corporis* was seen to retain the scheme, project, genetic code or *éidos* (that is, the image) of the individual human being. Pannenberg considers, however, that a subsistent immortal soul capable of surviving death and ensuring final resurrection should in principle be in a position to undergo new human experiences. However this would actually disqualify its very reason of being, for new experiences (those involved for example in purgatorial purification and the intercession of the saints) would provide the soul with a distinct identity, as if the human person was present in plenitude. As an alternative, Pannenberg suggests that human identity "during" the intermediate period between death and resurrection would be guaranteed better if such identity were retained or "codified" in God himself, because it is only "in Him" that our lives and histories can be made immortal."

"A document of the Roman Catholic Church issued from Congregation for the Doctrine of Faith provides a brief but helpful summary of what the Christian theology should maintain about the human soul, framed within an eschatological context: «The Church affirms that a spiritual element survives and subsists after death, an element endowed with consciousness and will, so that the "human self" subsists. To designate this element, the Church uses the word "soul", the accepted term in the usage of Scripture and Tradition. Although not unaware that this term has various meanings in the Bible, the Church thinks that there is no valid reason for rejecting it; moreover, she considers that the use of some word as a vehicle is absolutely indispensable in order to support the faith of Christians» (*Letter on Certain Questions concerning Eschatology* , 17.5.1979). Both serious scientific endeavour and religious and philosophical reflection over the centuries, have led to the reality of the human soul as the living, spiritual, "informing" centre of each human being. Historically speaking it can be argued that whereas science insists primarily on the inseparability of body and soul, that is, on the "psychosomatic" unity of the human person, religion leans towards the distinctness of the soul from the body, and thus, including the possibility of favouring a certain dualism between the two. Christian doctrine, however, on the basis of the oneness of the creating act of God, teaches that the spiritual soul is the only form of the human composite, yet, in the light of the doctrine of final resurrection, it allows also for the possibility of a temporary survival of the soul separated from the body. Besides, Christian doctrine understands the immortal dignity of each human being in terms in direct creation of human souls by God, and on this basis unequivocally teaches the priority of the specifically spiritual co-principle of the human beings (cf. Schönborn, 1984). "

An Encyclopedia Britannica(414) article rephrases the issue as follows:

"Much modern philosophical analysis of the concept of [mind](#) is inhospitable to the idea of immortality, for it equates mental life with the functioning of the physical brain (see [mind, philosophy of](#)). Impressed by evidence of the dependence of mind on brain, some Christian thinkers have been willing to accept the view—corresponding to the ancient Hebrew understanding—of the human being as an indissoluble psychophysical unity, but these thinkers have still maintained a belief in immortality, not as the mind surviving the body, but as a divine resurrection or re-creation of the living body-mind totality. Such resurrection persons would presumably be located in a space different from that which they now inhabit and would presumably undergo a development from the condition of a dying person to that of a viable inhabitant of the resurrection world. But all theories in this area carry with them their own difficulties, and discussion continues."

Peters (166) cites Philip Clayton's list of possible responses:

"(1) the Arbib Credo, which is the extreme form of reducing all theological insights about the human person into neuroscientific terms; (2) watch-outism, which says theologians should watch out because eventually neuroscience will explain everything religious in terms of brain activity; (3) soulbased explanations, which will attempt to immunize Christian anthropology from science by brute appeal to classical theologies of the soul; (4) instrumentalism and agnosticism, which sees brain research as indispensable

to the advance of scientific understanding while remaining agnostic on religious implications; (5) the no conflict view, which believes changes made in theology will quickly overcome the conflicts with science; and (6) compatibilism, which holds that the results of neuroscience neither prove theology nor disprove it; so this science is compatible with theology."

Issues for theology, religion, faith and Churches VII: Who promotes a Culture of Death?

Death and resurrection is a major theme in the New Testament.

1 Corinthians 15:26

26 Death is the last enemy to be destroyed.

1 Corinthians 15:53-55

53When this body which dies becomes one which will never die, what the holy writings say comes true. It says, 'Death is overcome by victory.

54Death, you have lost the battle. Death, your power to hurt us is gone.'

55Death hurts us because we are bad people. And our wrong ways are so strong because of the law.

2 Timothy 1:10

10 He has put death out of the way. He has shown people can have everlasting life by telling them the good news.

Hebrews 2:14-15

14God's children all have a body. That is why Jesus himself had the same. But because Jesus also had a body, he was able to die and stop the devil. The devil has power to make people die. But Jesus, by his own death, was able to stop the power of death.

15People were afraid to die. All their lives they were like slaves. When Jesus died, he was able to set them free from their fear.

Matthew 27:51-53

51 At that time the thick cloth that hung in the temple was torn into two pieces. It was torn from the top down to the bottom. The earth shook and big rocks broke.

52The graves opened. Many of God's people who had died rose from death.

53They came out of their graves after Jesus rose from death. They went into Jerusalem. Many people saw them there.

Acts 24:15

15 I believe that God will raise from death both the good people and the bad people. These people here believe the same thing.

Romans 6:4-5

4We were buried when he was buried because we were baptised into his death. Christ was raised from death by the wonderful power of the Father. So we also must live a new life.

5Have we shared with Christ and died as he died? Then we shall share with him by rising from death as he arose.

From the numerous references to death it is clear that death is something to be defeated. However the difference between transhumanists and the WCC membership might lay in the means to achieve this end. Transhumanists see technology as the means to defeat death whereas the scriptures and their interpretation by most theologians see God as the mean to defeat death.

Within many at least 'pro-life arguments' people in favor of different forms of euthanasia are described as promoting a 'culture of death. However, it is much less clear how the slogan of 'culture of death might be reinterpreted with advances and appearance of longevity and may be in the end more or less immortality research and products.'

As I outlined in 'Setting the stage III a lot of research is undertaken to slow down the aging process.

Question is what does that mean for WCC members? What is allowed and what isn't? Is longevity research and in the end applied products for humans allowable, or desirable? If yes, for what timeframe of living extension? 10 years, 100 years, 1000 years or more? Is immortality through technologies allowed or desired? When does longevity become immortality?

Is life extension allowed till it matches the ages in the scriptures?

If one looks at longevity

INSTANCES OF » Adam, nine-hundred and thirty years (Genesis 5:5)

INSTANCES OF » Seth, nine-hundred and twelve years (Genesis 5:8)

INSTANCES OF » Enos, nine-hundred and five years (Genesis 5:11)

INSTANCES OF » Cainan, nine-hundred and ten years (Genesis 5:14)

INSTANCES OF » Mahalaleel, eight-hundred and ninety-five years (Genesis 5:17)

INSTANCES OF » Jared, nine-hundred and sixty-two years (Genesis 5:20)

INSTANCES OF » Enoch, three-hundred and sixty-five years (Genesis 5:23)

INSTANCES OF » Methuselah, nine-hundred and sixty-nine years (Genesis 5:27)

INSTANCES OF » Lamech, seven-hundred and seventy-seven years (Genesis 5:31)

INSTANCES OF » Noah, nine-hundred and fifty years (Genesis 9:29)

INSTANCES OF » Shem, six-hundred years (Genesis 11:10,11)

INSTANCES OF » Arphaxad, four-hundred and thirty-eight years (Genesis 11:12,13)

INSTANCES OF » Salah, four-hundred and thirty-three years (Genesis 11:14,15)

INSTANCES OF » Eber, four-hundred and sixty-four years (Genesis 11:16,17)

INSTANCES OF » Peleg, two-hundred and thirty-nine years (Genesis 11:18,19)

INSTANCES OF » Reu, two-hundred and thirty-nine years (Genesis 11:20,21)

INSTANCES OF » Serug, two-hundred and thirty years (Genesis 11:22,23)

INSTANCES OF » Nahor, one-hundred and forty-eight years (Genesis 11:24,25)

INSTANCES OF » Terah, two-hundred and five years (Genesis 11:32)

INSTANCES OF » Job, "lived one-hundred and forty years" after his ordeal, and then "he died at a very great age," (Job 42:16,17)

INSTANCES OF » Sarah, one-hundred and twenty-seven years (Genesis 23:1)

INSTANCES OF » Abraham, one-hundred and seventy-five years (Genesis 25:7)

INSTANCES OF » Isaac, one-hundred and eighty years (Genesis 35:28)

INSTANCES OF » Jacob, one-hundred and forty-seven years (Genesis 47:28)

INSTANCES OF » Joseph, one-hundred and ten years (Genesis 50:26)

INSTANCES OF » Amram, one-hundred and thirty-seven years (Exodus 6:20)

INSTANCES OF » Aaron, one-hundred and twenty-three years (Numbers 33:39)

INSTANCES OF » Moses, one-hundred and twenty years (Deuteronomy 31:2;34:7)

INSTANCES OF » Joshua, one-hundred and ten years (Joshua 24:29)

INSTANCES OF » Eli, ninety-eight years (1 Samuel 4:15)

INSTANCES OF » Barzillai, eighty years (2 Samuel 19:32)

INSTANCES OF » Jehoiada, one-hundred and thirty years (2 Chronicles 24:15)

INSTANCES OF » Anna, older than eighty-four years (Luke 2:36,37)

INSTANCES OF » Paul, "the aged one" (Philemon 1:9)

INSTANCES OF since he was about a hundred years old (Romans 4:19)

What about the implementation of longevity such as access?

Issues for theology, religion, faith and Churches VIII: Transhumanist Blemish?

Step one: The blemish of deviating from a norm

In Matthew 5.48 we read

"Be perfect, therefore, as your heavenly Father is perfect."

In Leviticus 21.16-23, we read

"16 The LORD said to Moses, 17 "Say to Aaron: 'For the generations to come none of your descendants who has a defect may come near to offer the food of his God. 18 No man who has any defect may come near: no man who is blind or lame, disfigured or deformed; 19 no man with a crippled foot or hand, 20 or who is hunchbacked or dwarfed, or who has any eye defect, or who has festering or running sores or damaged testicles. 21 No descendant of Aaron the priest who has any defect is to come near to present the offerings made to the LORD by fire. He has a defect; he must not come near to offer the food of his God. 22 He may eat the most holy food of his God, as well as the holy food; 23 yet because of his defect, he must not go near the curtain or approach the altar, and so desecrate my sanctuary. I am the LORD, who makes them holy."

These two passages are often used to exclude anyone with a 'blemish' from priestly service which plays itself out in numerous denominations that disabled people can not be priest within their church. (415)

Luke 5:20, Luke 5:23, Mark 2:1-12 the above and others (416) are often interpreted in such a way that 'impairments' are seen as (a) a punishment; (b) a test of faith; (c) the sins of the fathers visited upon the children; (d) an act of God and as if the Bible regards people with disabilities as unworthy and whose injuries or sicknesses are a punishment for sin.

Writings such as the below from the Russian Orthodox Church(294) could be interpreted as that the sins of the fathers are visited upon the children.

XII. 5. Hereditary diseases comprise a considerable part of the totality of human infirmities. The development of the medical genetic methods of diagnostics and treatment can contribute the prevention of these diseases and the alleviation of the suffering of many people. It is important to remember, however, that genetic disorders often stem from the disregard of moral principles and the vicious way of life, which result in the suffering of the posterity. The sinful erosion of the human nature is overcome by spiritual effort; but if vice dominates in life from generation to generation with growing power, the words of Holy Scripture come true: 'Horrible is the end of the unrighteous generation' (Wis. 3:19). And the reverse: 'Blessed is the man that feareth the Lord, that delighteth greatly in his commandments. His seed shall be mighty upon earth: the generation of the upright shall be blessed' (Ps. 112:1-2). Thus, genetic research only confirms the spiritual laws revealed to humanity in the word of God many centuries ago.

Many question this connections.

TO quote Atsu Havor, Ho Municipal Director of the Department of Social Welfare in Ghana "Your condition is not a curse from anywhere and is also no manifestation of sins committed by your forebears,"(417)

Wynn point out (418) that in Mark 2:1-12 the act of forgiveness and the act of healing are timeline wise two non-connected actions

The Gospel of John seems to understand that people might link impairment to sin and tried to dispel that misperception (John 9:1-3) and one should use it accordingly.

As he passed by, Jesus saw a man blind from his birth. And his disciples asked him, "Rabbi, who sinned, this man or his parents, that he was born blind?" Jesus answered, "It was not that this man sinned, or his parents, but that the works of God might be made manifest in him" (John 9:1-3).

Others simply believe that we have to read the language of the Bible metaphorically, not literally and that Anthropomorphism which ascribes God with the physical characteristics of the human body and its properties and assumes that God judges the human body by its 'suboptimum' functioning is faulty.

We have been imagining God in our own terms and from our own experiences. We know that God does not literally have eyes that see images or ears that hear sounds or a mouth and tongue that speak words. These are all metaphors used to affirm God's capacity to know and to act upon, or affect, all events. There is nothing wrong with using metaphors to allow us to speak about God. Quite the opposite: It is important to speak about God and, therefore, we must use metaphors. Problems arise only when we forget: (1) that our language about God is metaphorical language and (2) that there is a relation between the particularity of the "me," who creates the metaphors and images of God, and the character of those metaphors and images. (419)

Cooper continues: Feminists remind us that it was male religious leaders and male theologians in a patriarchal culture who were responsible for the dominance of male language and imagery in regard to God. The point is well-taken. The form of the argument has special relevance to disabled Christians. As feminists argue, despite all the male images of God, men do not, by virtue of their maleness, more closely represent the image of God than do women. So it is true that the able-bodied do not, by virtue of their able-bodiedness, more closely represent the image of God than do the disabled. God does not see with eyes nor hear with ears nor move with legs, and so forth. Those of us who suffer from physically impaired hearing or physically impaired vision or who lack the use of their limbs are not, by virtue of those impairments, in violation of God's commandment to be perfect. (419)

Others like Paul Green (420) uses Exodus 4:10-17

"And Moses said unto the LORD, O my Lord, I am not eloquent, neither heretofore, nor since thou hast spoken unto thy servant: but I am slow of speech, and of a slow tongue. And the LORD said unto him, Who hath made man's mouth? or who maketh the dumb, or deaf, or the seeing, or the blind? have not I the LORD? Now therefore go, and I will be with thy mouth, and teach thee what thou shalt say. And he said, O my Lord, send, I pray thee, by the hand of him whom thou wilt send. And the anger of the LORD was kindled against Moses, and he said, Is not Aaron the Levite thy brother? I know that he can speak well. And also, behold, he cometh forth to meet thee: and when he seeth thee, he will be glad in his heart. And thou shalt speak unto him, and put words in his mouth: and I will be with thy mouth, and with his mouth, and will teach you what ye shall do. And he shall be thy spokesman unto the people: and he shall be, even he shall be to thee instead of a mouth, and thou shalt be to him instead of God. And thou shalt take this rod in thine hand, wherewith thou shalt do signs."

to make the point that

"Moses describes himself as someone who is speech impaired and his brother is clearly identified as his translator". (420)

He states further "Thou shalt do signs" makes him think that maybe Moses was deaf.

He states further

"Another reference to this to be found in the Koran, which has the child Moses undergo a test of some kind where he puts a hot coal in his mouth. This story would certainly seem to explain and therefore confirm that he was not by nature an oralist." (420)

Green interprets Exodus 4:11 "And the LORD said ... who maketh the dumb, or deaf, or the seeing, or the blind? have not I the LORD?" "to mean that God made everybody the way he intended to, and disabled people are not just faulty or broken able-bodied people after all?" (420)

Step Two: The transhumanist blemish: The language of perfection

The language around blemish and sin can be seen as part of the language of perfection. What are the consequences of such language of perfection?

What if one takes the language literally and not metaphorical as all the people who believe in the concept of blemish and sin do?

What if one does believe in Anthropomorphism which ascribes God with the physical characteristics of the human body and its properties and assumes that God judges the human body by its 'suboptimum' functioning?

What if one agrees with a language of perfection which defines perfection in terms of independence and completeness and interprets divine perfection as the absolute case of completeness and independence of being? A language which led to the arguments and reasoning's around blemish and sin.

Walker links transhumanism to a perfectionist ethics

Perfectionism is the philosophical view that we have a duty to develop excellence in our lives. It says that developing our minds and bodies are intrinsically good things to do. While we may gain a certain amount of happiness from achieving some level of cognitive or physical excellence—completing a university degree, or competing in the Boston marathon—such achievements are intrinsically good. In other words, this good is independent of all subjective feelings of happiness such accomplishments might bring. (252)

and links it to the Irenaean tradition, according to Hicks, which Walker interprets as "where natural evil exists so that we may be morally perfected in overcoming it".(251).

What are the consequences of the convergence of the acceptance of the anthropomorphological language of blemish and sin, the perfectionist language, the transhumanist/enhancement models of health, disease and disability/impairment, the transhumanist interpretation of Imago Dei, Co creation, Irenaean tradition, God's children and perfectionist ethics?

- No one would be without blemish no one could perform a service for God, no one could become a priest and everyone would be a sinner till one reaches the God like state. This is in essence the theological counterpart to the secular interpretation of the transhumanist/enhancement model of health, disease and disability/impairment.
- Parents would be responsible to bring their children to the God like state.
- People would be responsible to bring themselves to a God like state

Consequences:

The scripture parts which are interpreted as supporting the blemish and sin concepts could also be seen as supporting the above three actions.

Matthew 5.48 and Leviticus 21.16-23 do not state how to remove the blemish the sub-perfect appearance morphology of the body. They do not state whether God has to 'fix' them to perfectibility or whether humans can do it by themselves. As humans today are in numerous accounts changed the physiology of the human body in comparison to the times of God's encounter with humans a case could be made that taking the today humans as norms that the humans at the time of encounter with God might be on the starting scale of being of short stature.

Furthermore the language of perfectibility easily could be used to support the drive to become like God. This concept seems to be also in tune with (Genesis 1:26). "Humanity has the mark of God's image and is called to grow into God's likeness " if one accepts the transhumanist version of Image of God.

The scriptures -if one accepts the anthropomorphological interpretation- do not state what the endpoint of perfect would be. Leviticus 17 states "Say to Aaron: 'For the generations to come none of your descendants who has a defect may come near to offer the food of his God". But defect is a very general term and although in Leviticus 18-20 some examples are given they have to be seen as examples and not as an exhaustive list. In some cases examples of blemish and what would not be perfect are given but in other places no qualifiers are given leaving the terms defect, perfect and blemish open for interpretation. If one takes the anthropomorphological view then one has also to take the age numbers (see section Issues for theology, religion, faith and Churches V: Who promotes a Culture of Death?) serious, numbers which would indicate that humans at the time they met God were actually more advanced perfectibility wise than they were at the time they met Jesus. One could say that the 'fall' might have led to morphological deteriorations over time limiting the lifespan and other functions. Therefore when God talked about perfect he might have had something different in mind than the human body of the time Jesus met humans. The issue of God versus Men plays itself out mostly for Judeo-Christian and Islamic believe systems being less of an issue for other denominations such as Hinduism, Buddhism, Confucianism, Shinto and similar denominations.

Cooper offers a second way of interpreting perfection which takes its clue from Christology. "Christ-centeredness leads us to a very different story of the nature of God's life and a very different understanding of perfection, dependence, and limitation. It holds that we find the meaning of divine perfection through the life and teaching of Jesus and that we move to perfection in our own lives through Christ and by relating to others as he did. Perfection, here, is not first of all, or ever, a matter of independence or completeness. It means valuing others and attending to others simply because God values them and not because of their achievement or station in life or because of the group to which they belong. When we think of the meaning of perfection through this Christological vision, then God's perfection becomes the integrity of steadfast love, especially to the weak and scorned." (419)

Consequences:

This interpretation might allow for a temperance of the transhumanist/enhancement models based actions and the usage of science and technology which is less focused on changing the morphology of individuals towards a God like state with the accompanying appearance of the techno poor which will be seen even more as blemished and sub-perfect (see Issues for theology, religion, faith and Churches VII: The New Techno Poor Disabled/Impaired) but more on the changing the societal realities of inequities, prejudice and other societal programs. It fits with the WCC views of perceiving climate change as a spiritual crisis and the WCC purpose of overcome poverty, violence and injustice, and the theme of the WCC 9th assembly *God, in your grace, transform the world* and the Christmas message of 2005 which states

"Churches and their members world-wide stand on the side of the poor; this is especially true of Christians in Brazil who engage in struggles for the landless, the right to water for all, and the care of creation. Brazilian churches are working together, in the power of the Holy Spirit, with the hope of overcoming violence and helping to establish justice and accountability in politics." <http://www2.wcc-coe.org/pressreleasesen.nsf/index/pr-05-72.html>

Issues for theology, religion, faith and Churches IX: The New Techno Poor Disabled/Impaired

Matthew 25.31-46 provides a paradigm of God's concrete presence in the world. In this parable, God identifies with those who are poor, sick, and lonely. The question of those who are rewarded and those who are punished is the same, "Lord, when was it that we saw you hungry..." (Matt 25.37, 44. NRSV), the king replies, "Truly I tell you, just as you did it to one of the least of these

who are members of my family, you did it to me." (Matt 25.40). The disabled could easily be added to the list of people with whom the king identifies. Cooper suggests that this parable "encourages us to think of God as poor, hungry, disabled, needing help from us to attain the most elementary necessities of food, drink, clothing and companionship." (419)

As Paul argues that the body of Christ should honour those members who are weak (1Cor. 12.24), Moltmann argues that the weakness or disability of members of the community remind us that the exulted risen Christ is also the humiliated and crucified Christ. The

"suffering power of God is revealed in those who know the pains and slights of disablement. So there is no good diaconal, or charitable, service given by non-handicapped to the handicapped unless they have previously perceived and accepted the diaconal ministry of the handicapped to the non-handicapped. Congregations without any disabled members are disabled and disabling congregations." (419)

Christian social concern is the biblical theme of God's concern for those who have no voice or power in society. In effect, their autonomy as individuals and as a community has been restricted. In the case of survivable technological risks it would be those with less resources available to them, say economically, who are most at risk. Thus there isn't a single level of risk to be assessed but rather a spectrum of risk that needs to take this into account. As Garner states, "[s]ocio-economic inequalities may thus represent as profound a threat to human dignity as biotechnologies." (299) The perspective that in the long term technological benefits will become cheaper and trickle down to the less affluent does little to alleviate suffering in the short to medium term and the trickle down is not even true if the amount of people today who are without clean water and sanitation to just name one item is any indicator.

The Techno Poor Disabled and the Ability Divide

As more powerful, less invasive and more sophisticated enhancements become available, the market share and acceptance of enhancement products will grow in high income countries. This could very likely develop into a situation where those who do not have or do not want certain enhancements (the techno poor disabled) will be discriminated against, will be given negative labels, and will suffer difficult consequences.

For any given enhancement product there will not be a bell curve distribution, but rather a distribution jump from 'have nots' to the 'haves' which will lead directly to an ability divide. What will change -- depending on the social reality such as GDP, income levels and other parameters -- is how many people end up as 'haves' and 'have nots' (techno poor disabled). Indeed not everyone can afford the enhancement of ones body. And no society can afford to enhance the body of everyone who wishes so. The normative 'healthy' who can't afford the technological enhancements are the pool of people the critics call the 'techno poor disabled'.

The ability divide will develop between the poor and rich within every country. It will be bigger between low and high income countries than it will be within any given country. Not everyone will be able to afford enhancement of their body, and no society will be able to afford to enhance everyone, even if they wished it. Billions of people that today are seen as healthy will become disabled, not because their bodies have changed, but because they have not changed their bodies in accordance with a transhumanist norm (421).

If nothing changes in how we deal with issues today we might read something like that in like 2025 " The critics claimed from the beginning of the 21st century that the more enhancements become available the bigger the ability divide would become. They claimed that this was self evident and in tune with the divides developed after the introduction of other technologies. They claimed that

"every technology led to a new group of 'the Poor, the marginalized' and to new inequalities. There is no reason under today's global policy realities why this would be different if the human body becomes the newest frontier of commodification." "As much as human enhancement technology will become an enabling technology for a few it will become a disabling technology for the many. No technology can fix inequalities without a change in today's societal and political realities." "The idea that human enhancement technology would make the life of the marginalized better just does not hold true. It will lead to new groups of people who will be marginalized to a new group of 'the technological/ ability poor'" (421)

Indeed not everyone can afford the enhancement of one's body. And no society can afford to enhance the body of everyone who wishes so. The normative 'healthy' who can't afford the technological enhancements are the pool of people the critics call the 'techno poor disabled'. However taking into account the societal reality of the beginning of the 21st century what would have been the alternative. To stop developing technology? Most of the have countries and people were happy to see the 'others' the majority of the global population as the non-haves as poor. On the one hand there was no way that the political, societal systems would have changed fast enough to eliminate the existence of the 'poor'. On the other hand the market force driven by the desires of the haves ensured that the enhancement technology would come anyway. So the only option one really had was to increase preventative medicine (medical and social determinants of medical health), allow people who could not live without the enhancement to have access to a dignified death and to move resources from curative to enhancement medicine in order to ensure that the maximum amount of people can gain enhancements and the least amount would join the group of the techno poor disabled. We still have a long way to go as only 20% of the people globally have access to the enhancement technologies but with enhancement technologies becoming cheaper this number hopefully will rise."

A divide between the have and non-have 'traditional disabled people'

In the future one might read further something like that

"Of course many 'traditional disabled people' in the beginning of the 21st century were poor and lived in low income countries and it could not be expected that all of them would be better off with the transhumanist/enhancement model. However they would not have been better off with the medical model either as they and their country would not have been able to pay for the medical fixes. And the social model just was an illusive option. Therefore despite the problem of its limited usage among 'the traditional disabled' it seemed to be the best option taking into account the societal realities of the early 21st century.

A critic might point out that although some 'traditional disabled people' thought that the transhumanist/enhancement model was the best option to 'the traditional disabled people' that this has turned out to be a false hope. The critic might claim that Murray's allocation reasoning in regards to enhancement of the healthy versus enhancement of the 'sick' outlined above became increasingly standard allocation policy from the beginning of the 21st century to today (2025) making sure that enhancement procedures would never be 'wasted' on the ones who are below the traditional norm because with the same amount of money one could enhance more people who already fit the traditional norm than people who digressed from the traditional norm. However even if the 'traditional disabled people' might not have benefited as much as anticipated there were and still are many 'traditional disabled people' who are able to benefit from enhancement procedures as they find the means to pay for it. The jury is still out whether the 'traditional disabled people' would have fared better under a simple medical normative system. Furthermore the societal reality of the 21st century made clear that the 'traditional disabled people' could not expect real social equality and support and acceptance for their 'difference of abilities.

The 'disability rights laws' were in many cases seen as a temporary solution till the 'traditional disabled person could have been fixed or prevented. (247). In other cases they were just words without teeth. Besides if one reads documents from this time of our history one feels that the 'traditional disabled people' were busy defending the little they had not making much inroad to gain true social acceptance for who they were. Sure the transhumanist move for techno fixes of the Homo sapiens body might have been partly responsible for this problem however even they would not have been as this history paper pointed out earlier the transhumanist model of health, disease and well-being was inevitable taking into account the societal reality of the early 21st century. So running with the transhumanist/enhancement model might have been the least of a variety of bad scenarios 'the traditional disabled people' had in front of them."

Issues for theology, religion, faith and Churches X: Moving away from Androcentrism, abilitynormocentrism and Anthropocentrism to Intellicentrism, Cognocentrism, transabilitycentrism?

Anthropocentrism

Google 98700 hits

Anthropology is from the Greek [*anthropos*] meaning human, and the Latin [*centralis*] which pertains to the center. It is simply the doctrine that man is the center of all things, and the central fact of all existence, therefore he has no cause for God. It is the view that man is autonomous, and therefore everything must be understood in terms of how it relates to him.

Anthropomorphism

Google hits 305000 hits

Anthropomorphism ascribes God with the physical characteristics of the human body and its properties.

Biocentrism

Google 23000 hits

is the belief that all life, or even the whole universe living or otherwise taken as a whole, is equally valuable and humanity is not the center of existence. Hence, humanity is no more valuable than say, bacteria

Androcentrism 29000 hits

<http://en.wiktionary.org/wiki/androcentrism>

An ideological focus on males and men, and issues affecting them, possibly to the detriment of non-males.

Anthropopathism is the endowment of God with the emotional characteristics of the human capacity to relate. Attributes such as love, strength, wisdom, power, jealousy, wrath, and anger, that are the building block of human relationships are seen to find their place in the God who relates with the created word.

Intellicentrism/Cognocentrism

Google hits 2/5

is the focus on cognitive abilities as the prerequisite for being identified as a person/sentient being

Abilitynormocentrism

Google hits 0

is the doctrine that normative abilities as decided by certain social groups are at the center of all things, and the central fact of all existence that everything must be understood and relate to it.

Ability Centrism

Google Hits 0

is the doctrine that abilities are at the center of all things, and the central fact of all existence that everything must be understood and relate to it.

Normocentrism

Google Hits 3

is the doctrine that norms are at the centre

Transspeciesabilitycentrism

Google Hits 0

is the doctrine that abilities beyond species typical boundaries (secular view) that abilities which lead to God-like abilities, likeness and power (theological transhumanism, transhumanist theology) are at the Centre of all reasoning

Step One: Questioning Anthropocentrism

The concept of anthropocentrism is questioned and debated by many over a long period of time not the last the ecology movement.

Transhumanists also question an anthropocentric view. As James Hughes the executive director of the World Transhumanist Association states:

Transhumanists must also come to some terms with congenial wing of the animal rights movement since, like animal rights, transhumanism is opposed to anthropocentrism. But rather than rights for all life, transhumanist ethics seeks to establish the solidarity of and citizenship for all intelligent life. Transhumanists look forward to a society in which humans, post-humans and intelligent non-humans are all citizens of the polity. Consistent with this would be the demands of the Great Ape Project for an extension of human level protections to the great apes. (422)

Step Two: Questioning Androcentrism

Feminist theology believes that the language for God is not just anthropocentric, but also androcentric(423), that the words and images used exclusively represent male values and male interests as normative. Elizabeth Johnson speaks of three tasks for feminist theology. the unmasking of the hidden dynamic of domination; the second is the task of *recovery* of ignored, suppressed, or alternative wisdom, the untold stories of women and the possibilities that would build a new reality and third is the task of *reconstruction of a new community*, which promotes the full humanity of women. (423) Johnson believes that the consequence of exclusive, literal and patriarchal speech about God is deleterious to both human beings and to God. (423)

Third Step: The Move towards Intellicentrism/Cognocentrism

Transhumanist are one group which question anthropocentrism and androcentrism.

Transhumanists must also come to some terms with congenial wing of the animal rights movement since, like animal rights, transhumanism is opposed to anthropocentrism. But rather than rights for all life, transhumanist ethics seeks to establish the solidarity of and citizenship for all intelligent life. Transhumanists look forward to a society in which humans, post-humans and intelligent non-humans are all citizens of the polity. Consistent with this would be the demands of the Great Ape Project for an extension of human level protections to the great apes. (422)

The quote by Hughes makes clear that transhumanists do not move towards biocentrism which has quite a few followers but something I call Intellicentrism/Cognocentrism. This allows the inclusion of non biological sentient creations to be part of the transhumanist cognocentrist focus which would not be included in a biocentrism focus. This focus allows for the usage of biological organism for

synthetic biology purposes and for the design of new life form something which might be excluded under biocentrism. It allows for the addition of sentience to non sentient beings. Intellicentrism/cognocentrism is a form of anthropocentrism. Anthropocentrism existed because humans were seen as the only intelligent form. In the end anthropocentrism is a form of intellicentrism.

Not many are questioning the move towards Intellicentrism/Cognocentrism. Disabled people and individuals/groups in their sphere of influence are some of the few when they refuse the link of the term personhood and human rights to cognitive abilities. (305)

Fourth Step: Move towards Transspeciesabilitycentrism

The push for Intellicentrism/Cognocentrism is part of a bigger push towards transspeciesabilitycentrism which has the focus of generating abilities beyond species typical boundaries (secular view) towards abilities which lead to God-like abilities, likeness and power (theological transhumanism). It allows for the addition of sentience to non sentient beings.

Where does transspeciesabilitycentrism lead us? On the secular side it leads us to the generation of a new class of marginalized groups the Techno poor disabled, the preference of enhancement medicine over curative medicine, the move from human rights to sentient rights, the move towards longevity and more. On the theological side it might lead to new splits between different denominations hindering the reconciliation process, the labeling of WCC denominations as the denominations of death and other issues if the WCC does not follow the transspeciesabilitycentrism. However if one looks at the co-worker term used by the WCC in a recent document and the history of how the WCC deals with abilities it might be seen as ableist and as allowing for transspeciesabilitycentrism. This paper has shown that the abilitynormocentrism which is evident in many WCC and WCC affiliated groups (see Setting the stage II: WCC members statements on genetics in relation to disabled people) is simply not tenable and there are only two paths for actions to abandon abilitynormocentrism or to follow the transspeciesabilitycentrism.

The Final Step: From ability centrist to Vario-ability theology and Vario-abilitycentrism

Whether one follows anthropocentrism androcentrism or Intellicentrism/Cognocentrism they all have as an undercurrent Abilitynormocentrism/ Ability Centrist.

As feminist theology has been criticised as being white and middle class, it has also been criticised by women with disabilities as being exclusive and theology in general has been identified as being abilitynormocentrist by nature till today(22).

Images of God that embrace weakness are rarely used. Philippians 2.5-11 is underutilised as a source for describing the all-powerful God as the one who chooses powerlessness as are other parts of the scriptures. The image of the disabled God (419;424) is approached through three issues that are troubling for Christians with disabilities; perfection language in biblical faith, theodicy, and hope and salvation(425)

One could see Jesus as having made the transition from a **transhumanist person** (Jesus had capabilities 'normal' humans did not have) to an **impaired person** (on the cross) especially if one accepts andromorphological interpretations. Jesus also was a **disabled person** as he was hunted down by the religious and secular authorities because he had capabilities not accepted and supported by the religious and secular authorities. The 'A Church for all' document by EDAN (22) and the academic theological concept of the 'disabled God' (419;424;425) has to be developed in a more nuanced way to take into account the three versions disabled, impaired and transhumanist.

Action required from WCC and EDAN

What begins as a technology to relieve human pain becomes a technology to relieve the pain of being human. (283)

Need for Action:

A preliminary attitude towards technology study by Bainsbridge comes to the conclusion that highly religious people are most rejecting new technologies. (426)

Table 1: Percent Saying the Idea is Good by Belief in God (426)

| | Saying the Thing is Good | |
|------------------------------------|--------------------------|-----------------------------|
| | No Doubt God Exists | Doubt about God's Existence |
| Cryonic suspension | 13% | 28% |
| Recording all one's experiences | 77% | 81% |
| Having one's mind scanned in | 10% | 28% |
| Uploading a human personality | 22% | 34% |
| Cloning oneself | 5% | 19% |
| Nanites inserted into blood stream | 46% | 57% |
| Send personality to distant planet | 11% | 27% |
| | | |
| Average of 7 stories | 26% | 39% |

Table 2: Percent Saying the Idea is Good by Confidence in Religion and Science (426)

| | Organized Religion | | | Scientific Community | | |
|---------------------------------|--------------------|-----------|------------|----------------------|-----------|------------|
| | A great deal | Only some | Hardly any | A great deal | Only some | Hardly any |
| Cryonic suspension | 14% | 16% | 25% | 33% | 15% | 9% |
| Recording all one's experiences | 81% | 80% | 78% | 85% | 76% | 72% |
| Having one's mind scanned in | 9% | 18% | 25% | 27% | 14% | 16% |
| Uploading a human personality | 21% | 29% | 33% | 39% | 24% | 19% |

| | | | | | | |
|------------------------------------|-----|-----|-----|-----|-----|-----|
| Cloning oneself | 4% | 11% | 18% | 16% | 10% | 9% |
| Nanites inserted into blood stream | 44% | 51% | 57% | 63% | 49% | 40% |
| Send personality to distant planet | 10% | 16% | 27% | 30% | 52% | 12% |
| | | | | | | |
| Average of 7 stories | 26% | 32% | 38% | 42% | 34% | 25% |

Table 3: Religion and Agreement with Statements about Technological Transcendence (426)

| | Agree with Statement | | Confidence in Organized Religion | | |
|---|----------------------|-----------------------------|----------------------------------|-----------|------------|
| | No Doubt God Exists | Doubt about God's Existence | A great deal | Only some | Hardly any |
| In favor of technological transcendence: | | | | | |
| Humanity is on the verge of evolving into a higher form of life. | 19% | 23% | 16% | 20% | 26% |
| Technological convergence – combining nanotechnology, biotechnology, information technology and cognitive science – will greatly improve human abilities. | 40% | 59% | 40% | 51% | 53% |
| Cryonics (freezing a person's body until medical science is able to cure its diseases) will enable people to survive otherwise fatal accidents and illnesses. | 17% | 31% | 17% | 21% | 31% |
| Research on human cloning should be encouraged, because it will greatly benefit science and medicine. | 10% | 38% | 10% | 20% | 33% |
| Opposed to technological transcendence: | | | | | |
| There should be a law against cloning human beings. | 81% | 38% | 84% | 63% | 46% |

Although Bainbridge uses the tables to justify his claim that religious people from the Judaeo- Christian believe are mostly rejecting new technologies (426) I am reading the tables quite different. In regards to table 1 it is quite surprising that in regards to the issue of uploading a human personality 22% of who believed in God were in favor versus 34% in favor from the group which did no believe in good. In the same way it is surprising that the difference in regards to the issue of Nanites inserted into blood stream was very little between the believers in God (46%) and

the non-believers in God (57%). In regards to table 2 it is interesting to note that the people who strongly believed in organized religion were more positive than the once who did hardly believed in science. It also of interest to note that the average numbers are more or less the same for the ones who only believe some in organized religion (32%) and the ones who believed only some in scientific community (34%). Furthermore even between the group which strongly believes in religious organizations (26%) versus the group which believed strongly in the scientific community (42%) was only 16% points which I would hardly see as an endorsement of Bainbridges claim that Judaeo-Christian believe followers are mostly rejecting new technologies. If it is actually surprising how near these two groups score to each others. In regards to table 3 it is equally surprising that in regards to the statement "Humanity is on the verge of evolving into a higher form of life" that between the different groups

| Agree with Statement | | Confidence in Organized Religion | | |
|----------------------|-----------------------------|----------------------------------|-----------|------------|
| No Doubt God Exists | Doubt about God's Existence | A great deal | Only some | Hardly any |

only such a slide difference of believe exist

| | | | | |
|-----|-----|-----|-----|-----|
| 19% | 23% | 16% | 20% | 26% |
|-----|-----|-----|-----|-----|

The same is true for the statement "Technological convergence – combining nanotechnology, biotechnology, information technology and cognitive science – will greatly improve human abilities."

| | | | | |
|-----|-----|-----|-----|-----|
| 40% | 59% | 40% | 51% | 53% |
|-----|-----|-----|-----|-----|

The high acceptance of these two statements from the 'religious God believing' group and the slight difference towards the group which did no believe in God or organized religion is demanding a much greater efforts by the WCC and other denomination organizations to look at the issues especially to look beyond the pro life argument and the technologies of cloning and embryonic stem cells. Many technologies which per se have nothing to do with the question around when human life begins and which do not destroy human life will have severe impacts on societal structures.

EDAN, WCC and the transhumanist/enhancement model:

Only recent and to be expected future advances in science and technology make it possible to act on the transhumanist/enhancement model. It is understandable that the WCC in general and EDAN in particular have not looked into the transhumanist/enhancement models of health, disease, disability, impairment and well being in detail as of yet. Therefore a lot of work has to be done to

- look at whether the scriptures do or do no lend support to the transhumanist/enhancement model of health, disease, impairment and disability.
- to define clearly what a disabled god and an impaired god is and look at whether one could identify a transhumanist god as a result of the scriptures and their interpretation which guide the WCC and EDAN
- to look at how other denominations and faith relate to the different aspects and consequences of the transhumanist/enhancement models; whether there are commonalities or difference between denominations and faith in general and within WCC member groups in particular
- to look at how this new challenges might support or hinder the reconciliation process

Bottom up or Top Down?

In a recent publication of the WCC we read:

Context matters for both faith and science. In assessing research agendas and technologies, it is both reasonable and necessary to start again and again from the very simple question: Why are we doing this? Given the pragmatic, result oriented and often utilitarian ethics of the dominant technological culture, the question can be rephrased in these terms: What is the problem this technology (or science) is supposed to address? Who defined the problem and constructed the solution, and to what end? Is the 'problem' simply being defined according to the (commercial) 'solutions' that are available or that would be most profitable to those offering them? If context matters, we need to ask again and again not only Who will benefit? but also Who is most likely to lose out?" (26)

The document argues its case not from a supposedly neutral and objective position, but rather starts from the stories and voices of small farm holders, of Indigenous Peoples, of women and of persons with disabilities. Small scale farmers and Indigenous Peoples do not share the assumptions made by protagonists of the benefits of genetically modified seeds and crops. They challenge the broader public to very carefully examine the statements and promises made and to be vigilant regarding issues of power, profit and control. Indigenous Peoples are also struggling in many parts of the world to defend their genetic data, which have become a highly valued resource in the development of new pharmaceuticals and therapies. Persons with disabilities raise pertinent questions concerning the ideal of the medically managed person that is the shared ground for much of the discussion on human genetics. Many women warn that even their bodies are turned into an economic resource. These and other groups urge the wider public to take nothing for granted, but to re-examine the arguments brought forward in favour of genetic engineering, which usually reflect the context of societies highly integrated into the global economy and influenced by the modern development paradigm. It is precisely for this reason, that their experiences and voices are often marginalised and excluded from the discourse.(26)

Our

156 answers must grow out of our belief in the sovereignty of God and a recognition
157 that exploitation of science to divide the human community is, by its very nature,
158 sinful.(27)

The rejection of Able-ism (sin of able-ism) and the involvement of the most marginalized

If one looks at the quotes covered in Setting the stage II: WCC members statement on genetics in relation to disabled people and the ability normocentrist thinking it is evident that a much more differentiated non-able-ist discussion has to happen within the WCC and denominations. As 'ability', is one battleground for so many biotechnology issues, one might expect that disabled people the as 'sub-able perceived would shape the debates or at least be dominant players in them. That is not the case. This paper was written with the hope that it increases the knowledge and understanding of the consequences of the statements by WCC members on genetics for disabled people and in the end WCC members at large and it is hoped that it will lead to a more inclusive approach to genetics and other emerging technologies and existing technologies.

Some positive developments in regards to disabled people can be observed such as certain statements in a recent report of the National Council of Churches (USA)(27)

"The potential impact of biotechnology on people with disabilities raises profound philosophical and theological questions. Many people living with disabilities have meaningful, productive lives, and would state that the major suffering in their lives comes from the environment and social context: the physical, attitudinal, and social barriers that limit them much more than their disability.

Disability is increasingly understood as contextual and as simply one part, not the whole, of a person's identity. As such, disability then raises questions about what it means to be human, what kind of people should there be, whether disability is seen as defect, disease, or simply a difference in the diversity of humankind, and what it means to be a community that welcomes and supports everyone. Because "disability" can so easily and frequently be a place where we encounter the human capacity to make "one of us" into "the other," it calls for deep commitment to include the voices and perspectives of people with disabilities and their families in the dialogue and decisions about the use of biotechnology in personal, clinical, social, and political contexts."

Perception of Disability

The promise and danger of biotechnology is perhaps nowhere more obvious than the ways it affects people with disabilities and their families. There is no one "disability" perspective on the use of biotechnology, for people with disabilities and their families are first of all people, with different values, theologies, and understandings about the purpose of life and God's call to care for one another. The use of tools and processes declared to be neutral and value free, and designed to relieve suffering, holds great promise when they can support the lives of people with disabilities or alleviate unnecessary pain or suffering. But biotechnology becomes profoundly disquieting to many with disabilities when disabling conditions or predictions are equated with life long suffering, imperfection, or disease. When those personal and social values are combined with the power of technology to prevent the birth of a child with a disability or defect, the possibility of a new eugenics fueled by social values, market forces, and personal choice, rather than official policy, becomes quite real. Our reflection causes us to challenge the assumptions that everything needs to be "fixed" or "improved" and that we know how best to do this; and that just because something can be done does not mean it ought to be done. Science cannot save us from finitude. The pre-supposition for life and appreciation of the whole human person as an entity argue for society to offer no disincentives to reproduction by and of persons with disabilities, in the absence of deliberate cruelty and undue hardship.

Among the principles that have been identified by those with disabilities which ought to guide application of biotechnologies, and which we affirm are:

- a) The use of new human genetic discoveries, techniques and practices are strictly regulated to avoid discrimination and protect fully, and in all circumstances, the human rights of disabled people,
- b) Genetic counseling that is non-directive, rights based, widely and freely available and reflects the real experience of disability,
- c) Parents are not formally or informally pressured by medical, insurance or governmental policy to take prenatal tests or undergo "therapeutic" terminations,
- d) Organizations of disabled people must be represented on all advisory and regulatory bodies dealing with human genetics,
- e) The human rights of disabled people who are unable to consent are not violated through medical interventions.

Although this highlighting of the issue faced by disabled people is a good start it does not quite reflect the existing debate among disabled people e.g. the inability of non-directive counseling. It also does not highlight that disabled people routinely face genetic discriminations (in the secular developments II section of this background paper common genetic discriminations against as 'disabling in the medical sense' characteristics are outlined in some detail). However the report seems to be a good start and it omits for the most part biased anti 'disabled people' language present in many other documents.

It is of importance to disabled people that the report states that

"unhealthy exaggerated concepts of self-reliance, independence and personal privacy labeled as individualism stand in opposition to biblical concepts of covenant community, responsibility for one another, and care for the neighbor/stranger."(27)

Another positive example is the Caring for Life: Genetics, Agriculture and Human Life Discussion-document by the Working Group on Genetic Engineering of the Justice, Peace and Creation Team of

the World Council of Churches which covers the impact of bio and emerging technologies on disabled people to some extent.(427)

However the World Council of Churches and its members still have a long way to go to mainstream disabled people angles on issues into all their work. One recent example of omission is the total absence of disabled people's views on issues as simple as climate change, the tsunami catastrophe and the issue around water and sanitations which are having the most impact on the most marginalized of society and where the most marginalized should be the first at the table not the last if at all.

As the transhumanist/enhancement philosophy clearly shows. Without the acceptance of able-ism no transabilitycentrism would have worked.

Garner who is at the School of Theology, University of Auckland, New Zealand sees commonalities between Transhumanists and Christians

The development of transhumanist technologies and ideals provides both an ongoing challenge and an opportunity for those working within a framework of Christian social concern.

In a positive sense, Christian concern or 'traditional values' found in love of neighbor, compassion for the poor, justice for the oppressed, and an vision of human equality found in the *imago Dei*, demands that technology that can alleviate suffering and improve quality of life must be taken seriously.

While many resonances might be found between Christian social concern and variants of transhumanism such as democratic transhumanism, with its apparent stress on equality of all, there are also significant differences in the understanding of the human person. If one follows the view that human dignity or personhood derives not from some quality inherent in a person, such as rationality, but rather is sourced outside the human in value bestowed by God then difficulties will arise as to what is or is not considered appropriate application of technology within the human community. Furthermore, strands of transhumanism that follow an emphasis upon individual liberty will also find tension with a social vision that recognizes the dignity of the individual but also balances that against ethics such prioritizing another over oneself for the benefit of the wider community. (299)

However if the WCC and denominations do not do a better job in working for the oppressed and abilitycentrism is an oppression as it becomes an abilitynormocentrism in the same way as transabilitycentrism will increase the ability bar making the new height of ability the new norm I think the WCC will have a problem.

It is of interest that Garner claims that a democratic transhumanism is in favour of equality for all because that's the least of what the action and thoughts of members of the democratic transhumanism indicate as of now as the statements made by them are extreme ableist a notion which is anti-equality in my view. But may be Garner also buys into the ableist views as evident in the quotes in section II of this paper and therefore does not even see the problem ableism is posing for equity and equality for all.

The WCC has to find a way to involve and mobilize their members on a broad scale on these issues. It can't just be a few academics who work on the issues.

The responsibility of a Co-Creator (sin of consumerism, sexism, age-ism, racism)

A recent background paper for the Ecumenical Conversations of the 9th World Assembly of the World Council of Churches one reads (sent to me by e-mal on the 22nd of December 2005) asserts the validity of the creatio continua concept :

Called to be co-workers with God

The world is God's creation, and it belongs to God. Humanity has the mark of God's image and is called to grow into God's likeness (Genesis 1:26).

By God's grace the whole of creation is sustained, transformed, transfigured and brought into unity. By grace, God has the initiative in all things. However, the new humanity in Christ, renewed, regenerated and transformed by God's grace, is commissioned to take part in God's healing and transformation of the world (1 Cor. 3:9).

By God's grace, the world is being called to transformation, healing and reconciliation, but the ministry of proclamation remains our responsibility (Colossians 1:23). The *martyria*, *leitourgia*, *koinonia* and *diakonia* of the church become, therefore, synergic acts by which Christians, with full accord and commitment, implement in mission, prayer and action the work of God's grace in their lives for the transformation of the world.

For such theological reasons, the theme of the Assembly is in the form of a prayer. We are persuaded to give up any arrogant expectations based on the premise that with our force and skills alone the world can be changed and transformed. In most cases, history proves the contrary. The world continues to be in bad shape and many Christians continue to act accordingly even after two thousand years of Christianity. Therefore, the theme of the Assembly is an invitation to reflection, metanoia and transformation. We are first called to recognize and affirm God's initiative and work in all, and to pray in support of it. At the same time, we are urged to a personal response to God's initiative and to act according to our new humanity renewed by grace, as fellow citizens with Christ and co-workers with God. Seen through the eyes of faith, this world can and must be transformed: from unjust to more just relationships, from environmental destruction to care for creation, from a world marked by the deadly consequences of sin to a world open to receive life out of the hands of God.

"Another world is possible" was the motto of those who gathered in Porto Alegre for the World Social Forum in resistance to neo-liberal economic globalization and engaged in the struggle for alternatives. Christians have even more reasons to resist fatalism and to say:

God created the world and will never stop caring for it (Genesis 1-2). Christ shared the suffering of a world groaning for liberation (Romans 8) in his death on the cross. "Christ is risen. He is risen indeed" – the joy of Easter is an expression of the yearning and hope that the chains of sin and death will be broken for all human beings and all creation (Colossians 1:15ff.). The creative, reconciling and healing power of the Holy Spirit continues to transform the world as the breath of God's love (agape), which is God's transforming power of grace (Romans 8-11).

Remembering that all life is created by God and that God continues to care for it, we affirm the sacredness of all life and receive God's gift of life that we share with all other creatures and all creation. The earth is not ours, but God's common home for all who are connected within the web of life, the earth community (Psalm 24:104). It is not we who sustain life, but God. All our human power must be accountable to God. All human activities must recognize and respect the logic and rules (ecology and economy) of God's greater household of life (oikoumene) in just and sustainable relationships that make for peace and the flourishing of communities.

This whole statement will gain a whole different meaning depending of which secular and theological model of health, disease, disability and well being one follows. This statement puts a heavy burden onto the WCC

Alternative Globalization Addressing Peoples and Earth AGAPE:

In the AGAPE document(428) one reads

"This is God's challenge to us. Our faithfulness to God and to God's free gift of life compels us to

confront idolatrous assumptions, **unjust systems, the politics of domination and exploitation in the current world economic order.** Economics and **economic justice** are always matters of faith as they touch the very core of God's will for creation.

An economy of life reminds us of the main characteristics of God's household of life:

- The bounty of the gracious economy of God (oikonomia tou theou) offers and sustains **abundance for all;**
- God's gracious economy requires that we manage the abundance of life in a **just, participatory and sustainable manner;**
- The economy of God is an economy of life that promotes **sharing, globalized solidarity,** the dignity of persons, and love and care for the **integrity of creation;**
- God's economy is an economy for the whole oikoumene - the whole earth community;
- God's justice and **preferential option for the poor** are the marks of God's economy.⁷

And

Paul describes the world system of his time (the Roman Empire) as characterized by "idolatry and injustice" (Romans 1:18). All people and peoples are locked in this prison of greed (Romans 1:24ff.) under the power of sin leading to death and decay of the whole creation. Even if they wish to get out, they cannot (Romans 7:14ff.). But God's grace creates a new humanity out of all peoples (Romans 5:18), through the spirit of Christ (Romans 8). The whole creation groans to enter this freedom (Romans 8:19). No powers and rulers of any empire can separate those communities in the spirit from God's agape (Romans 8:31-39).⁽⁴²⁸⁾

And

An economy based on cooperation, reciprocity and solidarity is an **economy of life** in that it:

- overcomes social divisions;
- brings people and resources together for the good of each and every person and community in society;
- demands solidarity with accountability, acknowledging our interconnection with others and with the whole creation;
- bridges what has been split and unites what has been separated;
- relies on people taking the responsibility and becoming empowered to manage their own individual and communal livelihoods, chart their own histories, and develop their own attributes and potentials;
- replaces capital with people's work, knowledge and creativity as the driving forces of economic activity;
- takes individual and social rights as the reference for planning and implementing development;
- allows individuals, communities and nations to cooperate in building a solidarity-based globalization.

An economy of life is not an end, but a means to make possible the healing and development of persons, societies and the earth. Such an economy translates agape into practice.⁽⁴²⁸⁾

6.4.7. Churches and the power of the empire

- Especially churches are encouraged to analyze the convergence of the imperial powers and their military hegemony and economic domination.
- Churches are called to reflect on the question of power and empire from a biblical and theological perspective, and to take a clear faith stance on hegemonic powers.
- Churches are encouraged to support global initiatives to transform multilateral bodies such as the United Nations to address the real needs of the peoples of the world for peace and justice.
- Churches are asked to support initiatives of the churches in their reflection on hegemonic powers, such as critical efforts of the European churches on the contract for a European constitution, and the US churches' debate on empire.⁽⁴²⁸⁾

Conclusion

So let us, as churches together, make a clear decision, choosing between God and mammon, and opting for an economy of life:

- We affirm that the earth and all it contains are God's gifts, given out of love and care for all created beings - living and non-living.

- We acknowledge the interdependence of creation and human society, and that the sustainable use or excessive abuse of this relationship will either enhance or destroy our living together in this interdependence.
- We affirm our hope that a just global economy built on the creative alternatives of people the world over is not only possible, but that it already exists in communities based on communitarian sharing and resources distribution. Here in small pockets, we discern the absence of the selfish pursuit of wealth. God's love and justice calls the church to its true vocation to accompany these small initiatives in all regions that seek just alternatives. The church can not only learn from such local initiatives, but can draw lessons from them in seeking global alternatives.
- We acknowledge that this process of transformation requires that we as churches make ourselves accountable to the victims of the project of neoliberal globalization. Their voices and experiences must determine how we see and judge this project in the light of the Gospel. This implies that we as churches from different regions also make ourselves accountable to each other, and that those of us closer to the centres of power live out their first loyalty with their sisters and brothers who are suffering and oppressed. (428)

If one reads through the above excerpts of the AGAPE document it is obvious how the spirit, the goal of and the action required under the AGAPE document is influenced by changes related to science and technology research and development policies in general and the transhumanist philosophy in particular. In some ways the transhumanist philosophy needs the very philosophies the AGAPE document criticizes to flourish.

Recommitment to the Decade to Overcome Violence

The actions required from the wordings of the below WCC 9th Assembly document ³² are also heavily impacted by the transhumanist philosophy.

Nothing is so characteristically Christian as being a peacemaker" (St Basil the Great)
 The goals of overcoming violence and building a culture of peace imply spiritual, theological and practical challenges for our churches which touch us in the centre of what it means to be church. growing number of Christians re-discover a spirituality of non-violence.
 While we are beginning to discern in more depth the ethical demands of the responsibility to protect those who cannot protect themselves, we are convinced that international terrorism is not being overcome with military means.
 The respect for human dignity, the concern for the well being of the neighbor and the active promotion of the common good are imperatives of the gospel of Jesus Christ. Men and women are created equally in the image of God and justified by grace. Therefore, Human Rights are basic elements of preventing violence at all levels, individual, inter-personal, and collective, especially violence against women and children. This must include the effort to build and develop the rule of law everywhere. We shall further pursue the understanding of "restorative" or "transformative" justice with the aim of establishing viable and just relationships in communities.
 To relinquish any theological and ethical justification of violence calls for discernment that draws its strength from a spirituality and discipleship of active non-violence. We have committed ourselves to a profound common ethical-theological reflection and advocacy for non-violent conflict prevention, civilian conflict management and peace consolidation. The praxis of non-violence must

³²Call to recommitment at the midterm of the ecumenical Decade to Overcome Violence 2001-2010:

Churches seeking reconciliation and peace <http://www.wcc-assembly.info/fileadmin/files/wccassembly/documents/english/pb-07-dov-call.pdf>; <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/official-working-documents/recommitment-to-dov.html>

be rooted in a spirituality that acknowledges one's own vulnerability; that empowers and encourages the powerless to be able to face up to those who misuse their power; that trusts the active presence of the power of God in human conflicts and therefore is able to transcend the seeming lack of alternatives in situations of violence.

Our goal remains to move the search for reconciliation and peace "from the periphery to the centre of the life and witness of the church." Peace-building in non-violent ways is a christian core virtue and an imperative of the gospel message itself. We are determined to become what we are called to be: "ambassadors of reconciliation" (2 Cor 5). This is the mission of healing, including responsible accompaniment for those who are voiceless as well as speaking truth to those in power. We will reject every attempt to use violence and fear as tools of politics.

Lets look at the term violence. Violence is normally linked to military or verbal and sexual abuses. However, one might have to expand the vision of violence prevention to include the threat to ones self identity and self perception. The transhumanist model and the advances of science and technology product ability to modify the human and other biological bodies and to detect increasingly for characteristics genetic and non genetic in the pre or after birth state of human development leads to questions related to self perception and self identity.

To just use the case of disabled people.

Disabled people can opt to be seen as inherently defect and subnormal in need of being fixed by NBICS to a societal norm of the so called non-disabled e.g. giving legs to amputees which will be as good or worse than biological legs (the patient/medical type)^{iv}. They can opt not only to be fixed to a norm but also to be enhanced, augmented above the norm (e.g. giving bionic legs to amputees, which work better than the 'normal' biological legs) following the transhumanist vision of the so called non-disabled people who believe that every human body is defective (the Transhumanist type^v), and they can opt to see their biological reality as a variation of being not in need of fixing but in need of having the physical environment, the interaction with the physical environment, and the societal climate changed to accommodate their biological reality (e.g. giving wheelchairs to amputees and making the physical environment wheelchair accessible, or using teleportation devices if they are ever developed) (the social justice social model type^{vi}). It is well documented that not all identity self understanding of disabled people are not equally supported within society.

Slanting the playing field of public policy and the governance of NBICS in such a way that disabled people are forced to accept a certain identity and certain perception of self could be seen as violating the UNESCO International Declaration on Cultural diversity^{vii}, which states:

"Reaffirming that culture should be regarded as the set of distinctive spiritual, material, intellectual and emotional features of society or a social group, and that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs"

Many disabled people, people with non normative body compositions, functioning and abilities have forged a cultural identity based on a common history of oppression and a common bond of resilience. They see able-ism (discrimination based on non-normative abilities, functioning and body structures) an equal to racism, ageism, homophobia, and other other-isms. Furthermore disabled people are a social group. This means that this interpretation of cultural diversity entails that disabled should feel free to choose cultural identities of their choice whether they are medical social transhumanist or others.

Pushing people to accept a certain identity and discrimination against a cultural minority (the disabled), has interesting similarities with other types of state-sponsored action that are forbidden by international law, .such as torture. Article one of the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, 1984^{viii}, states

"torture means any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted on a personfor an reason based on discrimination of any kind, when such

pain or suffering is inflicted by or at the instigation of or with the consent or acquiescence of a public official or other person acting in an official capacity”,

One form of torture is the destruction of an existing self identity and replacing it with another one. For example, the brainwashing of prisoners of war is seen as a form of torture. The same kind of brainwashing is happening to disabled people. If I constantly tell a person without legs how worthless and defective they are and that they have to be able to walk on two legs in order to be seen as a human being, and therefore have to wear and use artificial legs, this could be seen as brainwashing and therefore torture. Granted, brainwashing of prisoners is not done by people believing they are doing prisoners any good, whereas many in the situation of the disabled believe they are in fact acting for the good of the disabled. However the line blurs if those governing science and technology refuse to accept and act on the social model self identity of the disabled and instead insist on using a simple medical model to characterize their problems and solutions, even if the disabled tell them to look at the social model to characterize the problems and solutions they face.

This question of being allowed to be who one is will also play itself out within the in the moment as non-disabled perceived people.

As I already have outlined above the transhumanist model of health and disease sees every Homo sapiens as defective, 'disabled/impaired' in need of improvement (above species-typical boundaries).

The only way out of the impairment/defective label is to enhance oneself beyond species typical boundaries. Human enhancement technology will lead to a new marginalized group 'the technological/ ability poor,' the 'techno poor disabled' Not everyone can afford the enhancement of ones body. And no society can afford to enhance the body of everyone who wishes so. The normative 'healthy' who can't afford the technological enhancements are the pool of people, the 'techno poor disabled'.

One can only speculate what that does to ones self esteem and to global and local peace if someone can not be at ease with there body knowing that they won't get employment and other goods needed for living because their body does not measure up to expectations and that they would never have the money to afford the changes needed. One can only speculate but this rat race of abilities can't be good for peace and other goals the WCC outlines in their writings over and over.

Final report of the Special Commission on Orthodox Participation in the WCC³³

The final report of the Special Commission on Orthodox Participation in the WCC acknowledges that the WCC and its member churches are

"23. Faced with the need to develop Christian ethics that respond to current problems and struggles, it is the responsibility of each church to shape its own moral teaching. At the same time, the Special Commission recognizes the WCC as a vital forum for raising and reflecting together on moral issues facing churches and society. "

And that

³³ Final report of the Special Commission on Orthodox Participation in the WCC <http://www.wcc-assembly.info/en/theme-issues/assembly-documents/policy-documents/special-commission.html> ; <http://www.wcc-assembly.info/fileadmin/files/wccassembly/documents/english/pb-03-specialcommission.pdf>

"29. It is critical that the result of such dialogue and cooperation be clearly shown to be coming from a distinctively Christian perspective, embracing the values of the gospel. The churches take on a "prophetic role" when they truthfully describe and react to situations in the world precisely in the light of the gospel. More reflection is required on what it means for churches in fellowship to engage in this way. A prophetic voice can never be divorced from the pastoral role, which includes building up, encouraging and comforting (1 Cor. 14:3). "

And that

"30. The Council is a necessary and helpful instrument in facing social and ethical issues when it enables the churches to:
reaffirm that they are bound together in fellowship by their common confession of Jesus Christ as God and Saviour, to the glory of the One God, Father, Son and Holy Spirit;
renew the commitment to stay together in order to foster love for each other, for love is essential to dialogue in freedom and trust;
recognize that differences arising out of churches' responses to moral issues, stemming from churches witnessing to the gospel in varying contexts, need not be insurmountable;
recognize that dialogue on social and ethical matters presupposes that they are not content simply to "agree to disagree" on their own moral teachings, but are willing to confront honestly their differences by exploring them in the light of doctrine, liturgical life, and holy scripture."

Transhumanism and other issues discussed in this book and the actions suggested within this book seem to fit paragraph 31-32 of this report where it states

31. New and unprecedented issues constantly arise for which directly applicable models for ethical judgments are not to be found within the churches' own traditions, insights and ethical formulations. This holds true particularly within the bio-ethical and bio-technical sphere. Churches are challenged to articulate a Christian ethical approach, e.g. to cloning, in-vitro fertilization and genetic research. The experiences and reflections of others in the wider ecumenical fellowship provide a valuable and often indispensable resource.

32. The way in which a church (or churches together) orders and structures its own decision-making on moral matters is in itself a prime ethical issue. *Who decides what and by which means?* The forms of decision-making and communication already embody a social ethic, and influence moral teaching and practice. Structures, offices and roles express moral values. Ways of exercising power, governance and access have moral dimensions. To ignore this is to fail to understand why moral issues can be so divisive.

Indigenous voices

Indigenous people are affected by transhumanism and the consumerism of the earth in numerous ways. Transhumanism will have an impact on how indigenous people perceive themselves and their relation to nature. Their traditional faith is also impacted by transhumanism. It is important to involve indigenous people in this discourse because they are affected and because they might offer useful ways to deal with these new technologies and the transhumanist believes.

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Interreligious relations & dialogue

In the document "Fortresses into wellsprings soothing the thirst for spirituality Affirming human dignity my neighbour's faith and mine from the meeting "Religious identities : For better or for worse? An interreligious encounter in Geneva 12-14 November 2005" one reads

"Many young people today are dissatisfied by what they perceive to be the inflexibility of institutionalised religion and its incapacity to respond readily to the challenges of daily life. Many are alienated by the lack of mutual hospitality among our traditions that prevent us from working together. They are troubled by the importance given to doctrines and dogmas. They are troubled by the indifference to the genuine expressions of their spirituality along non-traditional paths. Of even greater concern to many is the emergence of militant and extreme groups within most of our traditions, and the use and abuse of religion or religious sentiments in violence, conflicts, terrorism, and war."

"We are deeply moved by the interdependence of all things and how each of us contributes to, and is needed for, life to manifest itself in its rich diversity and wholeness. We have begun to look at the other not as a stranger to be feared but as a co-pilgrim to be embraced; not as a person to be transformed into our likeness but one that should be accepted in his or her otherness, with all the integrity of the faith, tradition and spiritual gifts he or she brings."

"Religion, as an integral component of culture and life, is a dynamic process. Therefore, we see ourselves not only as owning and responding to a heritage from the past but also as creating the ideas and ideals that will shape our future."

"Religion and responsibility

We recognise the danger that the call for interior transformation can easily be misunderstood as a call for disengagement from the world. Rather our religious traditions have emphasised the close relationship between inner transformation and compassion. We recognise the importance of the rational as well as the experiential, the contemplative as well as the active, the individual as well as the social dimensions of religious life and commitment.

A religious tradition, a person, or community that does not provide the resources, the energy, the ethical values and the necessary commitment to the transformation of society towards justice and peace loses credibility and relevance in the eyes of the world, and the younger generation."

"Common commitments

We recognise that the challenges we face in the world are too strong for any one of our traditions to deal with, and that we need each other in our attempts to respond to them. Therefore, we must not do separately what we can do together. It is in the course of discerning and acting together that we would truly discover each other, and it is in making common commitments that we would grow together. Therefore, we make the following affirmations and commitments:

We affirm that humankind, made up of many peoples, nations, races, colours, cultures and religious traditions, is one human family.

Therefore, **we reject** all attempts to drive wedges between religious traditions by presenting them as mutually exclusive communities.

We commit ourselves to learn more about each other, to learn from each other, and to discover and re-discover ourselves in relation to the other.

We affirm that at the heart of all our religious traditions are love, compassion, self-giving and values that sustain life and life in community.

Therefore, **we reject** all interpretations of religious teachings that promote enmity, hatred, or exclusion.

We commit ourselves to lift up the teachings and practices in our religious traditions that nourish life and promote community.

We affirm that conflict, violence and warfare are inconsistent with our religious teachings and none of our religions traditions support the resolution of conflicts through violent means.

Therefore **we reject** all violence used in the name of religion, all interpretation of religion that support warfare, and any attempt to interpret our scriptures to support conflicts.

We commit ourselves to interpret, teach and practice our religious traditions for the promotion of peace and harmony.

We affirm that discrimination on the basis of race, caste, social status, physical and mental abilities, ethnicity, gender, etc. is inconsistent with all our religious teachings.

Therefore, **we reject** all forms of discrimination and exclusion.

We commit ourselves to work towards an inclusive community and to struggle against interpretations of our faith and scriptures to justify discrimination.

We affirm that justice and fairness are central to religious life; that poverty, depravation, hunger and disease are forces that diminish human dignity and potential.

Therefore, **we reject** the ordering of economic and political life that brings about injustices, inequalities and the unconscionable exploitation of the earth for human greed.

We commit ourselves to defend together the dignity and the human, social, and economic rights of all people, and the integrity of the earth.

We affirm the rights of young people and children and the gifts they bring to the understanding and practice of religious life.

Therefore **we reject** all attempts to exclude them from the mainstream of religious life.

We commit ourselves to foster inclusive communities that would incorporate young people and children fully to enable them to bring their gifts to our common life.

It has been said that a journey of a thousand miles begins with a single step. We see these commitments as the steps we take towards the vision of a world that would live in justice and peace. We call upon all religious communities to make such acts of commitment of their own and so further the vision of a spirituality that would bring healing and wholeness to our fractured world.

- *This text was prepared by a small group of people of different faiths convened by the WCC: a Buddhist nun from Switzerland, a young Muslim woman from Iran, a Jewish educator from Israel, a Hindu professor from Frinidad/USA and a professor in the study of religions from Sri Lanka, all of whom brought different experiences into the discussions of religious life today and allowed for many perspectives to emerge." (429)*

In the Introductory remarks by H.H. Aram I*, Catholicos of Cilicia, for the conference "Critical moment in interreligious dialogue" (430) one reads the following

1) If co-existence is to prevail, it must be undergirded by common values. In pluralist societies, religions must go beyond mere cohabitation; they must constantly build communities on the basis of shared values. A shared community entails diversity, yet it is grounded in common values and goals.

2) Unless an inter-religious action is initiated on the basis of core values common to all religions, it will be superficial and will have only a provisional impact. Enhancing core values will also significantly help building mutual confidence, an essential feature of a credible dialogue. (430)

In my judgment, the following areas and issues call for a common action:

Religions must seek: i) to promote tolerance; ii) to build peace with justice; iii) to promote global ethics with renewed emphasis; iv) to support the United Nations' initiatives on justice, peace and reconciliation; and v) to provide globalization with a moral basis through their shared values. (430)

The assumption of such a critical role by religions is of pivotal importance at a time when the forces of globalization are destroying values highly revered by religions. Religion has become a fertile ground for people to exploit religious feelings for non-religious goals. Politics is motivated by interests; religion must act on the basis of values. Values, not interests, must be the guiding principle of inter-religious collaboration. In addition to deepening and broadening the common values, we must identify common concerns, develop multi-religious approaches to common issues facing societies, and organize advocacy. These are crucial issues that must be taken most seriously by all religions. (430)

We often speak about military, political or economic intervention. Humanity primarily needs spiritual intervention. (430)

Political oppression, socio-economic injustice and growing secularism have led to hate and distrust among religions. This trend needs to be strongly challenged. (430)

In all inter-religious meetings, religions have strongly rejected all teachings and approaches in the name of religion that support enmity, exclusion and hatred, and have stressed compassion, trust and non-violence as core values. They must pro-actively articulate their vocation as peace builders. They must combat violence by addressing those issues and situations that generate violence; by building a culture of peace with justice; by promoting confidence and understanding between religions, and by leading societies to reconciliation and transformation. (430)

Co-existing in one place and living together as one community are not the same. Co-existence based on political consensus is precarious and provisional; it is a potential source of tension. Living together implies sharing common values, concerns and goals and being in existential and creative interaction. Living together transforms the image of the "other", who is no more a stranger: a neighbour, not a rival, a partner, not a person to be either converted or rejected; one that must be accepted and respected. (430)

1) We must develop a vision of community where hate is transformed into respect, intolerance into acceptance, isolation into integration.

2) We must build communities where, through a process of integration, diversities are enriched and common values are deepened.

3) We must organize communities so that working together on issues of common concern may become a continuous process and a quality of being together.

4) We must seek new ways of living together as one community, where our self-perceptions are respected, deepened and broadened in dialogical interaction with each other. (430)

In the Pre-conference survey summary, by Courtney T. Goto for the June 2005 conference one reads (431)

From its first meeting, the planning committee for the Critical Moment in Dialogue conference hoped to create an international, interreligious meeting that would be different, moving beyond typical gatherings of the past. Rather than a dialogue on a particular topic, such as human rights, the committee called for a dialogue **on** dialogue, assessing the critical moment in which the interfaith movement finds itself.

The committee developed a three-question survey to be distributed to participants prior to the conference, which would elicit their collective wisdom about the status and impact of dialogue. The survey asked:

- What are the most valid or legitimate criticisms of dialogue that you've heard?

- How would you assess the impact of dialogue?
- What areas of concern are not reflected in current, mainstream interreligious discourses?

Though the committee was anxious that few participants would respond, the number of responses received was overwhelming, with 41% return rate. Many people wrote extensive answers to the survey questions, showing great enthusiasm for the conference.

With so many responses to consider, analysing and interpreting the data became a complex, daunting task, undertaken by committee members Ameeta Mulla Watal and Courtney Goto, who presented the findings of the survey on the first day of the conference.

In general, participants expressed a longing for the "more-ness" of dialogue. While they celebrated the positive impact of dialogue, they also recognised its failings, and yearned to see dialogue become a stronger and more effective tool. Survey respondents hoped to see dialogue move into the community at the grassroots level, thereby making change more palpable. They longed for a more inclusive dialogue that would bring in new voices, including more women, young people, and outsiders.

Finally, they advocated for more action-oriented-dialogue. Such conclusions inevitably led to key questions with which the planning committee hoped the participants would struggle:

- What is our role as leaders, clergy, activists, and scholars?
- Are we prepared to open up the 'cliques' of the interfaith movement?
- How do we respond to the critiques of interreligious dialogue?
- How do we envisage a new decade where dialogue will be more balanced?
- What steps will we take in order to achieve it?
- How do we create balance between pure activism and theological study?

The following quotes will convey something of the flavour of the questionnaire responses:

"[A] dialoguer must also be a risk taker! That is why [...] interfaith dialogue has remained an activity of the few, though there are noticeable signs that organisations who are interested in such activities are increasing and more people are interested to get to know about each others' religion and culture."

"Dialogue has impacted people as individual believers. In my own case, I have been led to a deeper understanding of my neighbor's faith and mine through dialogue. It has strengthened my commitment to Christ and opened my eyes to recognizing God's salvific activity outside the intentional Christian community."

"It [dialogue] is nourishing for the participants, reinforces their interfaith community and strengthens their desire to be together. However, it rarely reaches the vast majority of the people/clergy who have a problem with meeting each other. After all, most religious life is within insular communities for whom interfaith dialogue is not only not a reality, it is even a heresy."

"Interreligious dialogue and relations have led synergistically to creative collaborations and partnerships between individuals, faith communities, NGO's and governments to address local, national, regional and global crises and problems."

"Dialogue tends to remain at the level of the theoretical while ignoring day-to-day matters of practical life."

It is obvious that all of the thoughts in these documents are impacted by the philosophy of Transhumanism and what forms of ableisms we accept.

A need to address ableism and its consequences (244)

The field of Ability Studies

Judgment based on abilities is so ingrained in every culture that its use for exclusionary or otherwise negative purposes is seldom questioned or even recognized. In fact, groups who are marginalized due to

some form of ableism often use that very sentiment to demand a change in status (we are as able as you are; we can be as able as you are with accommodations).

Dealing with ableism is essential if we want to diminish, reverse, or prevent the conflict that may result from the disruptive potential of many nanoscale science and technology products. Without dealing with the tenets of ableism one can not achieve poverty reduction; peace; better living standards (especially for traditionally excluded segments of the population); empowerment of people; dialogue among civilizations; dialogue and integration of mainstream science with traditional, local and indigenous sciences of diverse cultures; diversity; sustainability; and distributive justice. Without tackling ableism, no real and durable sustainable equity and equality for any country, group, or individual will be achieved. It is time to see ability not just within the context of disabled people but to look at it from a broader cultural perspective.

I believe a variety of issues and groups could converge under the new field of Ability Studies(213;245;432) -- a discipline where the preceding challenges could be studied.

Ability Studies investigates: (a) the social, cultural, legal, political, ethical and other considerations by which any given ability may be judged, and which leads to favouring one ability over another; (b) the impact and consequence of favouring certain abilities and rejecting others; (c) the consequences of ableism in its different forms, and its relationship with and impact on other isms; (d) the impact of new and emerging technologies on ableism and consequent favouritism towards certain abilities and rejection of others; and (e) identification of the abilities that would lead to the most beneficial scenario for the maximum number of people in the world.

Ability Studies includes among others:

- the traditional disabled
- the techno poor disabled
- people who gain enhancements
- other non human targets for ability modifications
- new life forms

and looks at areas such as:

- ableism supported prejudices
- ableism differences between cultures
- ableism-driven judgement of countries
- ableism and development
- influence of ableism on numerous concepts such as biological diversity, cultural diversity, the culture of peace, and interpretation of documents treaties, and laws.

A radical departure by human rights groups, policy makers, individuals, industry, politicians, academics, marginalized groups, and society at large from behavior patterns evident today in regards to ableism is needed.

Appendix: I Synthetic biology applications³⁴

Areas Of Interest

- Fabrication: Synthesis and Assembly
- Computation & Signal Processing:
- Energy Management:
- Materials Processing:
- I/O And Sensing: MAS (chemical and E/B fields)
- Mechanics
- Replication And Evolution:

Energy Production And Storage

Summary

- Humans that photosynthesize
- Photosynthetic oil factories
- Power supply
- Convert light to chemical or electrical energy
- Superefficient agriculture via altered nutrient uptake (nitrogen fixing plants, etc)
- Mechanical energy storage, in bio-molecular springs.

New Devices And Assembly

- Plastic production with precise monomer order
- Carbon nanotube building/binding
- Collagen protein construction of molecular assemblies
- assemble small things
- Nanofabrication of micro and macro materials
- New biological pathways

³⁴ http://openwetware.org/wiki/Synthetic_Biology:Applications

- template independent DNA synthesis
- Biologically compatible miniature cameras

Molecular Medical Devices

- Medical Applications
- Reversal of Aging
- Disease Fighting
- Implantable living battery for medical device. out of electric eel cells.
- beneficial bacterial infections programmed to augment immunity, provide needed vitamins, etc.
- cells that circulate in the body (extension of immune system)

[\[edit\]](#)

Story

The number of bacterial cells in your body at this very moment is equivalent to the total population of your own cells. For the most part they are beneficial, preventing infection, aiding digestion, and perhaps even producing useful chemicals. These commensals, as they are called, have evolved with humans in a strongly symbiotic relationship. Clearly, our body is already conditioned to hold a vast army of prokaryotes to do its bidding. How can synthetic biology harness this potential?

Imagine a time in the not-too distant future. Elliott wakes up in the morning to get ready for work. After taking a shower, he examines his clean, clear face in the mirror, deciding that he can probably wait another month before re-applying the bio-spray that keeps his skin pores clean and renders shaving unnecessary. The spray contains skin surface bacteria engineered to eat dirt, oil, and dead skin, as well as dissolve the keratin in facial hair, while keeping the skin intact. They also prevent colonization by foreign bacteria that can cause infection of pores in skin, preventing acne. He looks at his old toothbrush in the medicine cabinet, and decides to throw it away. Ever since the dentist gave him the oral wash earlier in the year, he has had no use for it. The wash contained a population of bacterial cells programmed to vigorously eat and break down any stains or food residue, and dissolve plaque buildup. They also created a special biofilm which prevents other bacteria from colonizing, eliminating halitosis and gingivitis. Elliott decided to change his breath scent, and picked up a small pen light which he set to yellow and flashed in his mouth. A few minutes later he checked his breath. Faintly sweet and citrusy, very pleasant. The bacteria had been programmed to produce different aromatic compounds depending on the detection of specific pulses of light; the type Elliott had washed with gave him 7 popular scents to choose from.

Elliott walked downstairs to the table for breakfast. He had a bowl of cereal and milk, along with a spicy southwest omelette and some sausages. Eating was always an enjoyable experience. Elliott used to be wary of many foods, as he was prone to frequent indigestion, especially from spicy foods or dairy products. But since his visit to the dietician earlier this year, those problems were a thing of the past. After analyzing his symptoms, the doctor selected a digestive commensal from the Biobricks 3000 catalog which had been programmed for his needs. Now lactose and the irritating chemicals in most spicy foods were broken down with ease in his stomach, before they could cause any distress. An added benefit was that he no longer had to worry about food poisoning. The new commensals specifically targeted and killed any pathogens from a long list of possible food contaminants, and could even neutralize the toxins these bacteria produced. Elliott relished his new state of permanent gastrointestinal bliss.

Elliott then left for his exciting job at the screw factory. Little did he know that the PDKLHS (People's Democratic Republic for Lefthanded Screws) had sinister plans this very day. (to be continued)

What we need to do

Such consumer product applications require a significant amount of metabolic engineering, combined with tightly restricted control systems. The chassis for these systems are already in existence, as harmless commensal bacterial species already inhabit these areas of our bodies. Taking these as a starting point, we need to design metabolic pathways and physiology which defines a solution-specific molecular input/output. For example, the toothpaste bacteria must have a metabolism which is geared toward the "food" we designate; in this case, plaque or materials that can cause cavities. These metabolic systems need to be tightly controlled by regulatory and logic systems that allow for feasibility; i.e., sufficient energy and nutrients must exist and be managed in the pathway for the bacteria to happily make its living, without the buildup of harmful intermediates or any other metabolic "dead ends". Finally, the system must be designed so that waste products are optimal for function. For example, sweet smelling molecules for fresh breath, or other harmless outputs. The thermodynamics and molecular economy of the cell will have to be tightly constrained to accomplish this.

Potential Problems

Replication is one problem that will need to be overcome. How to keep the number of organisms at an optimum, so as not to elicit immune response or get any "buildup", while still reaping the benefits? One possible solution would be incorporating quorum sensing. Other problems involve restriction of growth. You do not want an anti-shaving bacteria to start munching on your eyebrows. Therefore somehow spatial control must be strictly maintained, and I am unsure how this would be accomplished.

Bioreactors

- Make intelligent chemical or bioreactors
- Dust eaters
- Total Material recycling to ideal output (controlled bioreactor)
- bacteria which break down waste and use it to create useful products
- break down of toxic chemicals to nontoxic components
- custom drugs
- in vivo drug regulated production

Biofilm Scrubbers

Many bacteria grow into colonies which form surfaces with specific properties, called biofilms. These films themselves can be viewed as dynamic materials which can be designed for various functions. One possible function that has been suggested is to generate a biofilm that forms an airtight sphere. The bacteria in this spherical biofilm matrix would secrete hydrogen gas into the sphere, producing a "balloon" which could float. I suggest that such free-floating biofilm spheres would be the perfect cleaners for air pollution. In highly polluted environments, the bacteria would scavenge the particulate sulfur, nitrogen, and carbon compounds out of the air, using them for energy and growth. Waste products would include hydrogen gas, which would be excreted to the inside of the sphere, keeping it afloat.

Life cycle:

These structures would start as a typical bacterial mat-like structure. As hydrogen is generated and secreted in between the layers, it will begin to swell until buoyancy takes over, and the mat floats away as a sphere. Questions:

How big will the biofilm structure have to be? it is biologically realistic? How will the spheres replicate? Is there enough energy and materials present in pollutants to power a Hydrogen producing metabolism, or will photosynthesis be required? Can a biofilm be engineered that can prevent the escape of hydrogen?

Programmable Devices And Control Logic

- Control cells
- build a molecular Turing machine
- create D/B and B/D converters (is this digital/bio?)
- signal propagation across cells
- programmable biological computers

You Me Genics

- Human debugger (read/write)
- body as edit surface
- cybernetics
- self repair bodies
- external human processing

How do we get there?

- Need to understand human genome extremely well
 - How to build using compatible materials?
- What would the interface look like?
 - Need a way to have inputs and outputs on cellular level
 - Can we make cells that passively detect signals (like action potentials) without disturbing it?
- How do we get away from all the bad notions associated with eugenics?
 - Need safeguards to prevent misuse

Programmed Organisms

- Controlled crop maturing (count days)
- chemically controlled pets
- changing behavior
- programmable pets

- biological robots
- syntho-eukaryotic cell
- consumer products

Smart Materials

- Smart paint
- living self-repairing materials (inhabited by colony of engineered cells)
- make materials (e.g. table top) that change shape on command

Sensors

- smart sensors
- noise detection and manipulation
- use cells to read, process, output information
- detect arbitrary substances
- self-reproducing chemical/radioactivity sensors
- detect biotoxins and encapsulate. flash when it does.
- responsive materials. oil lubricants by design/need
- specific detection of chemicals by proteins
- tools to measure concentration of protein in cell
- ecosystem debugger (read/write)
- single event/interaction detection (visualization)
- Intelligent Biosensors

Complex Assembly

- grow a house
- grow chairs like we grow corn (do we really want chairs?)
- build toys

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^{iv} G.Wolbring "Disability rights approach to genetic discrimination" in J. Sandor, ed., *Society and Genetic Information: Codes and Laws in the Genetic Era* (CPS books Central European University Press, 2004 ISBN: 963924175X)

^v *ibid* 3.

^{vi} The social model allows 'ableism' (discrimination based on non normative functions abilities and bodily structures) to be seen in the same light as racism or sexism.

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^{viii} *Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment*, G.A. res. 39/46, Annex, 39 U.N. GAOR Supp. (No. 51) at 197, U.N. Doc. A/39/51 (1984), *entered into force* June 26, 1987; see also Article 2 of the The Inter-American Convention to Prevent and Punish Torture Dec. 9, 1985, 25 I.L.M. 519

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Regulations 2001, ISBN 0 11 029705 9. Article 7 (1) (f) Crime against humanity of torture
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