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The New Issues in Bioethics – and Ethics of Reproduction

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SUMMARY

Modern biotechnology seems to presuppose that it has the ability to distinguish between the essentially human and its physical manifestations in a way that allows the latter to be treated as a means for the well-being of the former. This would suggest a dependence on Cartesian mind – matter dualism, and also that some of the most important bioethical issues may be related to problematic aspects of this particular worldview. Arguing that this position is both inherently inconsistent and at variance with the Christian doctrines of creation and incarnation, the article suggests that Christian ethics should maintain a critical position in relation to modern biotechnology for the sake of maintaining the integrity of the Christian community and the rationality of society.

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ZUSAMMENFASSUNG

Moderne Biotechnologie scheint vorauszusetzen, dass sie zwischen dem Wesen des Menschen und seinen physischen Manifestationen auf eine Weise zu unterscheiden vermag, die es gestattet, den Körper des Menschen als Mittel für das Wohlbefinden seines Geistes zu behandeln. Dies setzt sowohl eine Abhängigkeit vom kartesischen Geist-Materie-Dualismus voraus als auch eine Verknüpfung von einigen der wichtigsten Fragen der Bioethik mit problematischen Aspekten dieser besonderen Weltanschauung. Der Aufsatz zeigt auf, dass diese Position sowohl in sich widersprüchlich ist als auch im Widerspruch steht zur christlichen Lehre von Schöpfung und Inkarnation. Der Verfasser besteht deshalb darauf, dass die christliche Ethik eine kritische Position einnimmt, was die moderne Biotechnologie angeht, und zwar im Interesse der Integrität der christlichen Gemeinschaft wie auch der Vernunft der menschlichen Gesellschaft.

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RÉSUMÉ

La biotechnologie moderne suppose la capacité de distinguer entre l'essence humaine et ses manifestations physiques d'une manière qui permette de traiter le corps humain comme un moyen pour le bien-être de l'esprit. Cela suggère, d'une part, que l'on adopte le dualisme cartésien distinguant la matière et l'esprit, et, de l'autre, que certaines des questions les plus importantes en bioéthique peuvent être considérées comme des aspects problématiques de cette position. En arguant que le dualisme cartésien est intrinsèquement incompatible et en contradiction avec la doctrine chrétienne de la création et de l'incarnation, l'article suggère que l'éthique chrétienne doit maintenir une position critique face à la biotechnologie moderne, à la fois dans l'intérêt de l'intégrité de la communauté chrétienne et de la rationalité de la société humaine.

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1. Introduction

As technologies develop, they confront us with new and sometimes difficult ethical challenges.[1] Modern medicine is no exception to this rule; on the contrary, some of the more thorny issues in today's ethical debates are created by recent developments in biotechnology. Which are these issues, and why are they considered as ethical challenges? One would expect work towards improvement of the health of humans to be as close as possible to an undisputed good, irrespective of one's worldview and ethical persuasion, but this is obviously not the case. Why not? What causes the trouble, and how should ethics which takes the Christian

faith as its basic point of orientation respond to these challenges?

In this article, I will approach these issues in the following way. First, I will give an overview of recent developments in biotechnology that have received the attention of ethicists. Then I will investigate how far this aspect of modern medicine can be said to be conceived within the framework of a specific worldview, and, if that is the case, whether this worldview has implications which are problematic from an ethical point of view. Finally, I will reflect on these issues from a Christian point of view. Will the answers given by Christian ethics tend to be different from those provided by the society at large? Should Christian communities thus consider themselves as a kind of counterculture in opposition to the attractions of modern technology? Or should we, in relation to these issues, rather strive for consensus across religious and cultural boundaries?

2. Biotechnology and the health of humans[2]

Abortion can hardly be counted among the recent challenges. However, the development of prenatal screening technologies, which enable parents to decide if they want to let the baby be born on the basis of what they know about its gender and health prospects early in the pregnancy, has undoubtedly placed the whole issue in a new light. It is one thing to decide not to have the child on the basis of an evaluation of the life situation of the mother, and, in some cases, also the father; different issues are raised by making that decision because of wanted or unwanted features of the child.

But foetuses are not only disposed of, they may also be tailor-made. One way of doing that is somatic cell nuclear transfer (SCNT) or cloning. This technology, which is used to create an embryo that is genetically identical to the person from whom the cell nucleus is taken, can be used for two purposes: 1) therapeutic cloning, which produces embryos for the sake of research or treatment, after which the embryos are destroyed; 2) reproductive cloning, which aims at actually producing children. Reproductive cloning has successfully been done with mammals, the sheep Dolly having being produced in this way already in 1996. Cloning of humans is, however, illegal in most countries, and there are no known cases.

Different from cloning, artificial reproduction technologies (ART) copy nature by making use of genetic material from both father and mother, but still manipulate the process in various ways. Among the less invading technologies is artificial insemination, where sperm from the father is artificially inserted into the uterus of the mother. In vitro fertilisation (IVF) takes eggs from the body of the mother and lets fertilisation take place in a Petri dish, after which one or more of the fertilised eggs are returned to the uterus for normal development. These technologies may be modified through gamete donation, where either sperm or egg comes from another person than the couple who are supposed to care for the child. Sperm donation through artificial insemination is a technology which has been in use since the end of the nineteenth century; the development of IVF has made even egg donation possible. This introduces the added complication of surrogacy, which is the bearing of the child by another woman than the one who is to be the social mother; the egg, depending on the problem that has caused the surrogacy in the first place, may then come from the social mother (who then is also the biological, but not the child-bearing mother) or from a third woman.

Embryos created through IVF may be tested for genetic quality before being placed in the uterus. This technology, which is called pre-implantation genetic diagnosis (PGD), can be used to eliminate unwanted embryos, which in this case may be embryos with a genetic disease, or embryos with unwanted characteristics like the wrong gender. The technology may also be used for the creation of so-called designer babies, which are children who have particularly good genes in some area or another, and for the creation of so-called saviour siblings: children produced for the sake of providing cells wanted for the treatment of siblings with a hereditary disease. The ability to control the reproduction process which is achieved through the combination of IVF and PGD thus represents one of the more obvious ethical challenges created by modern biotechnology.

Genetic diseases can also be treated by manipulating the genes in the adult individual directly. In so-called somatic cell therapy, this is done in a way that does not involve permanent change in the DNA of the person who is treated in this way; the change thus dies with the patient. This differs from germ call therapy, where one tries to eradicate hereditary diseases, or to enhance the human genome, by permanently changing the genes as

transmitted to later generations. The ethical issues involved are obviously much more serious in the latter case. Common to the technologies are, however, the questions of what counts as enhancement, and who are to give the answer to that question. We probably all agree that the eradication of hereditary disease is a commendable goal. But what about the creation of stronger, more intelligent and creative humans? Is that necessarily an undisputed good? Is there an ethically relevant difference between treatment and enhancement, and if so, where is the line to be drawn, and by whom?

Making our lives healthier and happier may not always involve genetic therapy, though. Much of the work is still done through technologies that have been in use for many years: Pain killers, mood and cognition enhancers, drugs that improve performance in sports or other activities, treatment for various kinds of developmental problems. These technologies are obviously less invading than (permanent) changes to the human DNA; still, they raise similar ethical challenges: Which means are acceptable for which goals, and who are eventually to give the answers to questions like these?

However, we do not only expect to have healthier and happier lives; due to the development of modern medicine, we also expect to have longer lives than previous generations.[3] Does this development in the direction of the longer and healthier have any kind of inherent limit, or could it go on until we have conquered death altogether? Some scientists and their supporters, who often identify themselves as transhumanists, seem to think that this goal might not be as far-fetched as it has usually appeared to be; the possibility of controlling the human DNA created by ART, better control of the biochemistry involved in aging, the use of nanotechnology to keep cells in good shape, and the combination of computer technology and biotechnology may open possibilities we still do not quite understand.[4] The day may therefore not be far off when we actually have to take even this problem seriously: Is the very long, possibly even unending, healthy life the goal we want to achieve? Which means are necessary for taking us there, and do we accept the costs, ethical and others, associated with these means?

3. Mind – matter dualism and its ethical implications

Modern biotechnology seems to presuppose that it has the ability to distinguish between the essentially human and its physical manifestations in a way that allows the latter to be treated as a means to the well-being of the former. Neither abortion, prenatal diagnosis, ART nor PGD would work without the ability to distinguish between the creation of the embryo and the formation of the human being.[5] This distinction is strengthened by the possibility of gene manipulation, and completed when one, like some transhumanists, speaks of the ability of (endlessly?) prolonging human existence by means of brain uploading or artificial intelligence.

This seems to suggest that modern biotechnology, like modern science in general, is heavily dependent on Cartesian mind – matter dualism, according to which there is a strict distinction between thought and matter to the extent that the latter has no inherent value apart from being used by human intelligence for the sake of understanding and manipulating it to improve our life conditions.[6] This assumption has undoubtedly paved the way for the exploration, and thus the cure, of human disease in an unprecedented way. At the same time, this approach creates some disturbing questions. What constitutes the human subject if the body is reduced to an instrument which is not part of the essential human who supposedly enjoys the fruits of the improvement of its condition? What exactly is the norm of human dignity if the materiality of the human is reduced to a tool for the experience of disembodied satisfaction? Might this reduction of the human to its ability to think and feel, which arguably is the essence of the anthropology of modernity, even influence the way one thinks about and acts in relation to other human beings? Can a human who is conceived as disembodied intelligence actually love its neighbour?

During the twentieth century, asking precisely these questions, voices from different backgrounds have become quite critical of the way in which we allow ourselves to manipulate the givenness of the natural. Among the earlier representatives of this criticism was C.S. Lewis, who in his 1943 essay 'The Abolition of Man' criticised modernity's one-sided focus on the mathematical relationship between facts, which in Lewis' view entails precisely the implication that nature has no value apart from its being an object for humans exercising their power over it. But power is not something humans always exercise in ways that are just and righteous; hence Lewis's well-known statement that 'what we call Man's power over Nature

turns out to be a power exercised by some men over other men with Nature as its instrument.' When Lewis then anticipates, on the basis of what he knows of the ideology of scientific progress, what he calls the final stage in 'Man's conquest of nature', his essay reads like a summary of the contemporary issues in bioethics. 'This final stage is come', he writes, 'when Man by eugenics, by pre-natal conditioning, and by an education and propaganda based on a perfect applied psychology, has obtained full control over himself.'[7] The situation will then be different from any other situation experienced in the history of humankind. Not only will the ability of the select few to control the many have been greatly increased, the rulers (who Lewis calls the Conditioners) will 'have sacrificed their own share in traditional humanity in order to devote themselves to the task of deciding what "Humanity" shall henceforth mean'. In Lewis' view, the understanding of human dignity as a universal value is not compatible with assigning to a select few the decision about what constitutes the essentially human.

3.1 The Gnosticism of modernity

After World War II, arguments along these lines have for obvious reasons tended to be used by Germans in particular. According to the historian and philosopher Eric Voegelin, modernity's Cartesian dualism implies a sense of alienation from the world that is supposed to be overcome through science and social action.[8] For Voegelin, modernity is essentially a religious movement whose main characteristics he gathers under the label of Gnosticism. As its Messianic figures he mentions the nineteenth century prophets Hegel, Marx and Nietzsche. The fulfilment, however, of the Gnostic religiosity of modernity Voegelin finds in the totalitarian ideologies of Nazism and Communism, whose adherents proclaim that the fact that they have discovered the scientific solution to the ills of the world entitles them to dominion over those who have not been so fortunate. This belief in the transformation of the world for a better future, which is also typical of all kinds of millennialism, Voegelin calls the immanentising of the eschaton,[9] and it leads naturally to the leadership being entrusted to the informed elite, i.e. the Übermensch.

In his book *Das Prinzip Verantwortung* ('The Imperative of Responsibility', German original 1979) the German philosopher Hans Jonas argued that, since we do not know where the scientific endeavour may take us, the only responsible option is always to consider the worst possible implications of our actions. Informed by his studies of ancient and modern Gnosticism, which was also an important source and inspiration for Voegelin's research, Jonas was highly critical of the implications of what he saw as the modern infatuation with technology, and suggested the following modification of Kant's categorical imperative: 'Act so that the effects of your action are compatible with the permanence of genuine human life.'[10]

3.2 The problem of transhumanism

The defenders of the idea of human enhancement through ART and PGD are aware that their views on this subject place them in the ideological vicinity of the eugenics which were employed by the Nazis and others in the first half of the twentieth century. While admitting that control of the reproduction process is essential for realising the goal of enhancing human health and happiness, and arguing that society therefore has an obligation 'to subsidise the birth of healthy children', they still assert that they differ from earlier representatives of this kind of eugenics by thinking that the birth of the not so healthy should not be made straightforwardly illegal. This is the position of the organisation Humanity+,[11] which brings together the supporters of the ideology called transhumanism or posthumanism.

Others are not convinced that the difference is significant. Jürgen Habermas has been particularly critical of the dangers inherent in assisted reproduction and pre-implantation diagnosis.[12] To see the production of designer babies as 'liberal eugenics regulated by supply and demand'[13] he considers a contradiction; as he sees it, one simply cannot mention eugenics and liberalism in the same context. For Habermas, liberalism is founded on the principle of equal opportunities and it is therefore incompatible with making decisions on behalf of future generations as implied in genetic engineering.[14] In his view, human dignity can only be upheld through upholding reciprocity in all morally relevant discussions;[15] modern biology thus threatens the idea of the human as understood in classical liberal thought by nullifying the possibility of informed consent as far as future generations are concerned.[16] The very idea of permanently changing the understanding of what it is to be human introduces an asymmetry in our relationship with our descendants which is incompatible with the idea of human dignity on

which the modern liberal project is founded. In this respect, Habermas essentially agrees with C.S. Lewis.

In North America, the Jewish ethicist and physician Leon Kass has also argued that human cloning and technological life extension are incompatible with the ideals of liberal humanism. Kass maintains that extending human life beyond its natural limit is not an undisputed good; on the contrary, life as we know it is dependent on having a limit for inducing in us the kind of responsibility that is necessary for realising the truly human.[17] An even more influential opponent of the transhumanist idea of human enhancement by means of technology is Francis Fukuyama.[18] In his well-known work *The End of History and the Last Man* (1992) he argued that liberal democracy and Western market economy represent the best possible models for human societies; with the end of the Cold War, the time of battles between competing ideologies was over. The problem that now confronts us is the problem of controlling technology. In his view, the idea of technological enhancement of humans is therefore the one outcome of the liberal democracy that may contain the seeds of its undoing. In *Our Posthuman Future: Consequences of the Biotechnology Revolution* (2002) Fukuyama therefore argues that biotechnology endangers the liberal project by possibly introducing alterations to the human nature that entail new forms of inequality.[19] In the long run, the victory of liberal democracy is therefore dependent on the end of science and technology as we know them today.

The transhumanists' rejection of Fukuyama's critique is explicitly based on the view that there is no human essence; we are therefore free to go where technology takes us.[20] The idea of unrestricted human development is thus clearly dependent on a strict separation between fact and value that will not let the world or any part of it – including humans – retain any inherent value which is not open to change by means of human (or artificial) intelligence. We are free to go where we want to go to the extent that it is, or will ever be, technologically possible.

Not all proponents of SCNT, ART and PGD subscribe to the ideology of transhumanism. Still, it is difficult to avoid the conclusion that in so far as we actually allow ourselves to control human reproduction to the extent that we permanently change the human genome, we reduce the value of the naturally given to raw material for human manipulation, the outcome of which is that what eventually will count as the essentially human is left for the scientists to decide. Is this actually where we want to go?

Added to this is the problem of the allocation of resources for medical research. Given the lack of money needed for the treatment of fairly basic medical issues in large parts of the world, is the prioritising of research for the sake of prolonging the lives of the healthiest part of the world population a reasonable decision? Is not even this decision unduly determined by the fact that science is governed by the worldview of the more or less secularized Western world? Would not even a fairly basic consideration of issues of justice and equality in a global perspective suggest that we should rather go elsewhere for our scientific ideals?

4. The Christian worldview and mind – matter dualism

To the Christian worldview, Cartesian mind – matter dualism is highly problematic. For one thing, it is hardly consistent on its own terms, subscribing to the idea of human equality while in fact leaving the decision of what it is to be human to the powerful and the intelligent. In addition, it is obviously at variance with the doctrines of creation and incarnation as commonly received in Christian theology. According to the doctrine of creation, humans are at home in the world as it is, and are therefore not dependent on technological manipulation to overcome their feeling of alienation. Even as sinners humans are supposed to be able to fulfil God's charge of becoming the lords of creation without destroying it. The Gnosticism of modernity, which has shown itself so clearly through the abuse of nature which has landed us in the problems of pollution and climate change, and which increasingly shows itself in the liberation from the naturally human as implied in ART, is therefore something Christian theology should meet with consistent critique. This critical attitude is strengthened by the story of the incarnation, which emphatically confirms the value of human nature in its physical manifestation through its being selected as the arena for the revelation of the divine.

Living in a world tainted with evil, sin and death, work for the improvement of the human situation clearly is not the problem. On the contrary, this should, and has always been, considered as an important aspect of the basic Christian commandment of loving one's neighbour. Christian ethics

even agree with the transhumanists in maintaining that illness and death are problems that eventually will be solved. Rather than seeing enhancement of the human condition as a problem, as critics of modern biotechnology like Habermas, Kass and Fukuyama tend to do, the idea of human improvement beyond what is known today is built into the very core of the Christian hope; the New Testament explicitly states that 'it is not yet made manifest what we shall be'.[21] The idea of improving the human condition even to the extent of conquering death is therefore not a problem for Christian ethics.

In two ways, however, the Christian vision for human improvement differs from the one maintained by biotechnology. In the first place, the Christian idea of improvement does not entail liberation from embodiment. On the contrary, and consistent with faith in an incarnated Saviour, embodiment is essential even in Christian eschatology.[22] For Christians, the human body in its frailty and perishability is not 'a flawed piece of engineering';[23] it is an area of divine creativity and revelation that will be maintained even in the eschaton, which thus is seen as embodiment without illness and frailty. In the second place, this improvement is not for humans to achieve on their own; it is to be expected as a gift in exactly the same way as the world we experience today is to be received as a gift.[24] In so far as it takes its core doctrines of creation and incarnation seriously, Christianity is therefore neither Gnostic (seeking liberation from embodiment) nor millennialist (realising the eschaton on one's own), while Cartesian mind – matter dualism tends to be both.

Christianity thus basically thinks of illness as a solvable problem and it has no interest in preserving the vestiges of frailty and death for the sake of maintaining the truly human. A Christian worldview will, however, be deeply sceptical of the idea that humans on their own will be able to provide the final solution; from a Christian point of view, this is essentially a reassertion of 'the Pelagian heresy of perfectibility.'[25] The reason for this scepticism is that the attempt at doing so must presuppose the ability of humans to transcend embodiment for the sake of penetrating the world by means of their own intelligence, and this is a position that is both philosophically problematic and at variance with the Christian doctrines of creation and incarnation. In addition, it is easily misused by people who merely pretend to know and who for the maintenance of their position are dependent on the suppression of all others; it is therefore hardly a coincidence that the inherent millennialism of modernity so easily lends itself to totalitarian ideologies. For this reason, it is an important task of Christian ethics to 'witness to the freeing of the world from salvific pretensions in order that it may embrace its proper temporality'.[26]

5. Christian ethics and the problems of ART

How should we then handle the concrete challenges of modern biotechnology in general and ART in particular? On the one hand, both the development and the application of many of the artificial reproduction technologies require an extensive use of human embryos later to be discarded, and thus presuppose a fairly liberal attitude toward the problem of abortion, which is at variance with a Christian understanding of the dignity of the human embryo. On the other hand this technology certainly represents an attractive possibility of solving both the problem of childlessness and the problem of hereditary disease. At the same time, however, this particular technology clearly plays into the idea of freeing the conception of children from the constraints of ordinary sexual activity as a means of controlling the process and its outcome. If one does not want to lend support to the project of realising a disembodied and immanentist eschatology, are artificial reproduction technologies at all acceptable? The answer of the Roman-Catholic Church is a rather emphatic 'no',[27] and while not all Protestants may find this answer immediately convincing, it is at least consistent in a way most of the alternatives are not.

In addition to the problems related to all kinds of ART, gamete (cell) donation severs the link between biology and family and thus clearly presupposes an instrumental view of nature. Admittedly, this link is already severed in many cases through adoption. It is, however, one thing to do one's best in a difficult situation; it is something quite different to create it wilfully in the first place. This problem is exacerbated through surrogacy, which often also has the uncomfortable side-effect that women in the poorer parts of the world bear the children of the rich and affluent.

The problem of having children tailor-made through PGD is also deeply problematic for a number of additional reasons. Children are usually loved unconditionally by their parents; how will it

influence the parent-child relationship if the children instead are loved for their being made just so? How will it influence the liberation process through which all children find their own identity if they know that their own identity is in fact not their own, but something their parents chose for them? And what about the relation between the society-at-large and the children made through PGD for the sake of bodily, artistic and/or mental excellence? Will they be allowed to excel while the rest of world sits back and applauds? Or will they find themselves being discriminated against by the not-so-excellent who fear for their positions? This is Habermas' asymmetry problem brought down to the level of the practical and the concrete. Not all humans will have their genes improved simultaneously. This thus adds to the human potential for conflict a new difference which we have no experience in handling. Could there be any good reasons at all for doing such a thing?

Technologies for having longer and healthier lives are considerably less problematic as long as one maintains an understanding of the human body in its frailty as an object of both cure and care, not a problem to be left behind.[28] The aspiration of developing technologies for conquering death has, however, obvious eschatological implications that hardly seem compatible with the 'embrace' of our 'proper temporality'.[29] This idea comes in two variations, considering the conquest of death as either dependent on techniques focussing on the material (technological enhancements of the human body) or on the mental (uploading of brain content to a more durable medium, thus presupposing that the contents of our minds are reducible to digital patterns with an exact physical representation).[30] Particularly in its latter form, this project transforms mind – matter dualism into a doctrine of material reductionism that seems strangely inconsistent; if all mental processes are reducible to their physical representation, the very concept of truth, upon which all science including biotechnology builds, dissolves. In this particular area of research, then, the disembodied eschatology of the modern Gnostic appears as a mere contradiction.

The idea of human equality as understood both by secular liberalism and the Christian faith thus tells us to be extremely careful in relation to modern biotechnology, in particular as far as ART is concerned, and this attitude is reinforced by what we have learned from the eugenics experiments performed in the first half of the twentieth century. Still, I think there can hardly be any doubt that these technologies will be used. The combined interests of capitalism looking for a potential market and humans wanting to make use of the full potential of advanced technology are hardly resistible in the long run. The undisputable advantage of ART is its potential for curing hereditary disease. In principle, it is something quite different to use PGD for the sake of promoting excellence. In practice, however, the line will sometimes be vague, and it is improbable that we will have one completely without the other.

If this is the situation, what should Christian ethics aim for? Should it limit itself to catering for the Christian minority and concentrate on maintaining its integrity in an increasingly hostile world? Or should it also be a critical voice in the public debate, fighting for the integrity and dignity of the human embryo and the biologically given, even if nobody will listen? According to the Christian faith, the Christian position is a reasonable position; its corroboration by more or less secular liberals without a clear Christian allegiance is at least a partial confirmation of this principle. Christian ethics can then hardly allow itself to care for the Christian minority alone; it must, for the sake of its own consistency, aim for universality and address all potentially reasonable humans, which are all humans, irrespective of ideological and religious persuasion. It will never meet universal acceptance and will always remain highly disputed, but, as long as the idea of human equality is considered an idea worth fighting for, so will the unlimited application of the possibilities of modern biotechnology. Through this quandary we will have to find our way forward.

6 Conclusions

Science has succeeded in giving us both considerably longer and considerably healthier lives; for this we should be forever grateful. Still, modern biotechnology is tainted by its dependence on Cartesian mind – matter dualism to the extent that some of its implications point in the direction of the Gnostic and the irrational. Nevertheless, its apparent success and the powerful positions of its adherents make it likely that its findings will be both used and further developed. In this situation, Christian ethics should aim at maintaining the consistent and the rational both for the sake of the integrity of the Christian community and for the sake of preserving the rationality of society to

as large an extent as possible. As far as experience can tell, this is a position that will meet with heavy opposition as well as find unexpected allies from time to time.

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Endnotes

1 This article is based on a lecture held at the biennial conference of the Fellowship of European Evangelical Theologians (FEET) in Orsay near Paris in 2014.

2 My overview of ethically relevant aspects of contemporary biotechnology is dependent on Marianne Talbot, *Bioethics: An introduction* (Cambridge: Cambridge University Press, 2012).

3 While children born about 1950 had an average life expectancy of 45 years, it is now almost 70 ('The Evolution of Life Expectancy in the World', 2014, available at www.inequalitywatch.eu/spip.php?article106, accessed 16 February 2015); in the more developed countries, it is well above 80 (Wikipedia, 'List of countries by life expectancy', available at http://en.wikipedia.org/wiki/List_of_countries_by_life_expectancy, accessed 16 February 2015).

4 For a defence of the view that the conquest of death is not only possible but desirable, see Nick Bostrom, 'Why I Want to be a Posthuman When I Grow Up' in Max More and Natasha Vita-More (eds), *The Transhumanist Reader* (Malden: Wiley-Blackwell, 2013) 28-53.

5 This is also a main point of orientation in Gilbert Meilaender, *Bioethics: A primer for Christians* (Grand Rapids: Eerdmans, 2013).

6 On the Cartesian emphasis on the malleability of the material, see Derk Pereboom, 'Early modern philosophical theology' in Philip L. Quinn and Charles Taliaferro (eds), *A Companion to Philosophy of Religion* (Oxford: Blackwell, 1999) 103-110 and Gavin Hyman, *A Short History of Atheism* (London: I.B. Tauris, 2010) 19-46.

7 C.S. Lewis, *The Abolition of Man* (New York: HarperCollins, 2009) 59. In Lewis' time this critique was not commonly accepted among Christians; on the contrary, eugenics was generally seen as uncontroversial among Protestants in the first half of the twentieth century; see Amy Laura Hall, 'To Form a More Perfect Union: Mainline Protestantism and the Popularization of Eugenics' in John Swinton and Brian Brock (eds), *Theology, Disability and the New Genetics* (London: T&T Clark, 2007) 75-95.

8 His most important works in this context are *The New Science of Politics*, originally published 1952, and *Science, Politics and Gnosticism*, originally published in 1958; both to be found in Eric Voegelin, *Collected Works 5: Modernity Without Restraint* (Columbia: University of Missouri, 1999). For a summary of his position, see Mark T. Mitchell, 'Personal participation: Michael Polanyi, Eric Voegelin, and the indispensability of faith', *Journal of Religious Ethics* 33 (2005) 65-89 and Lee Trepanier and Steven F. McGuire, 'Introduction' in Lee Trepanier and Steven F. McGuire (eds), *Eric Voegelin and the Continental Tradition: Explorations in Modern Political Thought* (Columbia and London: University of Missouri Press, 2011) 1-13.

9 Russell Blackford, 'Trite Truths about Technology: A Reply to Ted Peters' in Gregory R. Hansell and William Grassie (eds), *Humanity V: Transhumanism and Its Critics* (Philadelphia: Metanexus, 2011) 176-188, provides an interesting glimpse of how this immanentising of the eschaton appears from the perspective of one who actually favours the idea of limitless human enhancement.

10 Hans Jonas, *The Imperative of Responsibility: In Search of an Ethics for the Technological Age* (Chicago: University of Chicago Press, 1984) 11. For an introduction to Jonas's thought that places it in its philosophical context, see Richard Wolin, *Heidegger's Children: Hannah Arendt, Karl Löwith, Hans Jonas, and Herbert Marcuse* (Princeton: Princeton University Press, 2001).

11 Quotations from the website *Humanity+*, 2015, available at http://humanityplus.org/ [accessed 16 February 2015].

12 Jürgen Habermas, *The Future of Human Nature* (Cambridge: Polity, 2003). For a critical summary of his position, see Elaine Graham, 'Bioethics after posthumanism: Natural law, communicative action and the problem of self-design', *Ecotheology* 9 (2004) 178-198, 188-191.

13 Habermas, *Future of Human Nature*, vii. Liberal eugenics ('designer babies') is here distinguished from 'negative' eugenics, i.e., genetic manipulation for the sake of treatment of inherited disease.

14 Habermas, *Future of Human Nature*, 13-14.

15 Habermas, *Future of Human Nature*, 33.

16 Habermas, *Future of Human Nature*, 51-52.

17 Leon R. Kass, *Ageless Bodies, Happy Souls*, 2003, available at www.thenewatlantis.com/publications/ageless-bodies-happy-souls [accessed 27 January 2014] and Leon R. Kass, *L'Chaim and Its Limits: Why Not Immortality?*, 2007, available at www.firstthings.com/article/2007/01/lchaim-and-its-limits-why-not-immortality [accessed 27 January 2014].

18 For a critical presentation of his position, see Graham, 'Bioethics after posthumanism', 181-185; for Fukuyama's own summary, see Francis

Fukuyama, *Transhumanism*, 2004, available at www.foreignpolicy.com/articles/2004/09/01/transhumanism [accessed 9 April 2014].

19 'If we start transforming ourselves into something superior, what rights will these enhanced creatures claim, and what rights will they possess when compared to those left behind?' Fukuyama, *Transhumanism*. According to Graham, 'Bioethics after posthumanism', 184, this amounts to a secular version of natural law theology.

20 See Nick Bostrom, *Transhumanism: The World's Most Dangerous Idea?*, 2004, available at www.nickbostrom.com/papers/dangerous.html [accessed 9 April 2014].

21 1 John 3:2 (ASV). This point is also emphasised in Brent P. Waters, 'What is Christian about Christian bioethics?', *Christian Bioethics* 11 (2005) 281-295, 288 and 293, and in Ted Peters, 'Transhumanism and the Posthuman Future' in Hansell and Grassie, *H+: Transhumanism*, 147-175, 148.

22 See 1 Corinthians 15:35-49.

23 This is the expression used in Max More, 'The Philosophy of Transhumanism' in More and Vita-More, *The Transhumanist Reader*, 3-17, 15.

24 Cf. the distinction between futurology and eschatology in Peters, 'Transhumanism and the Posthuman Future', 161.

25 So Waters, 'What is Christian about Christian bioethics?', 292. The difference between the Christian emphasis on healing and the modern attempt at 'eliminating the burdens of finitude and suffering' is also heavily emphasized in Robert Song, 'Christian bioethics and the church's political worship', *Christian Bioethics* 11 (2005) 333-348, 342.

26 So Song, 'Christian bioethics and the church's political worship', 333.

27 The Roman-Catholic Church rejects even artificial insemination techniques because 'they dissociate the sexual act from the procreative act'; see *Catechism of the Catholic Church* (London: Chapman, 1994) section 2377; the very idea of disembodied reproduction is thus seen as deeply problematic.

28 One should, however, be aware of the problem of allocation of resources in a North-South perspective that is closely related to this approach; not all research that is determined by the white man's wants and illnesses is defendable from a global perspective.

29 Cf. the critique in Brent P. Waters, *From Human to Posthuman: Christian Theology and Technology in a Postmodern World* (Aldershot: Ashgate, 2006) 118-119, of techniques founded on the modern and postmodern 'fear of finitude'.

30 This is, e.g., clearly presupposed in the computations in Ralph C. Merkle, 'Uploading', in More and Vita-More, *The Transhumanist Reader*, 157-164. For a critique of the idea of 'cybernetic immortality' as heavily dependent on reductionist Enlightenment anthropology, see Andrew Pickering, 'Brains, Selves, and Spirituality in the History of Cybernetics' in Hansell and Grassie, *H+: Transhumanism*, 189-204.