Bert-Jaap Koops · Christoph H. Lüthy
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Engineering the Human

Human Enhancement Between Fiction and Fascination

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ISBN 978-3-642-35095-5 ISBN 978-3-642-35096-2 (eBook)
DOI 10.1007/978-3-642-35096-2
Springer Heidelberg New York Dordrecht London

Library of Congress Control Number: 2012955747

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

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Chapter 1
Towards Homo Manufactus? An Introduction to this Volume

Christoph H. Lüthy and Bert-Jaap Koops

Abstract This contribution explores how the concept of human engineering emerged and what place it assumes in contemporary debate. The term has recently been used in discussions on a range of subjects, among which are technology, science and sports. As the number of different ways of adjusting the human body keeps growing, the idea of 'transhumans' is taking hold in today's society. Although scientists generally consider it unlikely that 'transhumans' will become a reality in the foreseeable future, the concept still causes fear, raises hopes and leads to numerous questions. The main issue is whether or not it is ethical to interfere with the human body to such an extent. While it is certain that these kinds of changes can transform the human condition, the extent to which this is possible remains unclear.

Transhumanist Scenarios

The Transhumanist Declaration of 1998 begins with the following statement:

> §1. Humanity stands to be profoundly affected by science and technology in the future. We envision the possibility of broadening human potential by overcoming 'aging', cognitive

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B.-J. Koops et al. (eds.), *Engineering the Human*, DOI: 10.1007/978-3-642-35096-2_1,

> shortcomings, involuntary suffering, and our confinement to planet Earth (The Transhumanist Declaration 1998).

One is tempted to reformulate these sentences in the present tense: 'today, humanity is profoundly affected by science and technology'. Does our rising life expectancy not testify to impressive successes in combating the process of ageing? Are our cognitive shortcomings not already made up for by electronic gadgets and psychopharmaceuticals? Is much involuntary suffering not being alleviated or entirely done away by today's medical treatment?

The Transhumanist Declaration (1998) is, however, not about recent medical, technological and scientific advances, but emphasises a vision of the near future—a prediction, moreover, which it welcomes and embraces. It is based on the assumption that the various recent technological accomplishments will soon converge, and that this convergence should bring about a new type of human being, the 'transhuman' mentioned in the manifesto's title.

A number of scenarios have been developed, some by real or would-be scientists, others by science fiction authors or filmmakers, in which the world resembles that of *Star Wars*, where human beings live together with intelligent robots and modified man-machines. 'These will soon become symbiotic, leading to a synergy between men and machines that few anticipated', according to Benford and Malartre (2007) (196). Warwick (2003), for one, of the Department of Cybernetics at the University of Reading, is convinced that 'the era of the Cyborg is now upon us', the Cyborg being 'part human part machine' (131). The inventor and science author Kurzweil (2005, 2006), in turn, predicts that

> the most important and radical application particularly of circa-2030 nanobots will be to expand our minds through the merger of biological and nonbiological or machine intelligence. In the next 25 years, we will learn how to augment our 1000 trillion very slow interneuronal connections with highspeed virtual connections via nanorobotics. This will allow us to greatly boost our pattern-recognition abilities, memories, and overall thinking capacity, as well as to directly interface with powerful forms of computer intelligence. The technology will also provide wireless communication from one brain to another. In other words, the age of telepathic communication is almost upon us. (43)

Or take the philosopher Bostrom (2003) at Oxford University, who in 2003 announced that he was preparing himself ethically for our future as 'transhumans', that is, genetically and bionically modified creatures that Bostrom (2003) hopes will be 'healthier, wittier, happier people', who moreover 'may be able to reach new levels culturally' (498).

The majority of contemporary scientists find most of these predictions highly unrealistic. They either consider it unlikely that the envisaged merger of nanotechnology, engineering and biotechnology can be carried out as predicted; or they reject the proposed time frame between 2020 and 2050 as implausibly soon; or, when they do give some credit to these scenarios, they suggest that legislation or ethical standards will prevent them from being implemented.

Man-made Man?

Whether plausible or not, such scenarios inevitably provoke discussions, cause anxieties, engender fantasies and nurture expectations. Discussion may take on a variety of forms, ranging from science fiction novels and movies to proceedings of ethics conferences, from advisory policy reports to public debates. Moreover, each country or, rather, each linguistic community conducts these discussions differently. This has to do with the terminology that is used to refer to the bundle of medical, technological and scientific procedures that are allegedly transforming humankind. In English, the term 'human enhancement' dominates the debate, implying the improvement of the already existing functions and capacities, while the alternative terms 'artificial man' or 'transhuman' imply a disruptive discontinuity between current, naturally engendered human forms and future, artificial ones. The German expression 'die Perfektionierung des Menschen' ('perfectioning of man'), by contrast, possesses, like 'enhancement', a positive connotation of improvement, but not of discontinuity. The alliterative Dutch expression 'de maakbare mens' ('makeable man'), in turn, provides a more value-neutral term that can include any of the current techniques applied to changing human nature—not all of which need to aim at enhancement.

The present collection of essays was first written for a Dutch-speaking audience, and it carried in its original title the local catch-all term—'makeable man'—which indeed stands for all kinds of procedures enhancing, improving or indeed engineering humans. The 12 sections of the 2003 Technology Festival held at Amsterdam, which dealt with the issue of the 'makeable man', convey an idea of the diverse connotations of this term:

1. Cloning
2. Prenatal selection of babies
3. Gene therapy
4. Techniques of conditioning behaviour
5. Neurosurgery
6. Replacement medicine
7. Cosmetic surgery
8. Anti-ageing
9. Top-class sport (enhanced performance)
10. Cybernetics (applying artificial intelligence to human beings)
11. Nanotechnology and its use inside the human body
12. Nutrition

It turns out that this untranslatable catch-all term, 'makeable man', offers a range of advantages over expressions such as 'human enhancement'. Precisely because of the

all-inclusiveness of the term, Dutch and Flemish society has benefited from a comprehensive discussion. The debate has taken future scenarios of converging technological, medical and scientific advances seriously, has attempted to gauge their likelihood and to fathom possible advantages and disadvantages, and has contemplated the ethical and political limits that ought possibly to be formulated. Here are some examples. The just-named 2003 Technology Festival in Amsterdam was entitled 'Homo Sapiens 2.0: Festival about the "Makeable Man"'. In 2004, the Flemish Institute for Science and Technology Assessment organised an essay contest with 'Makeable Man' as its theme. In translation, the description of the essay question read as follows: 'Artificial muscles for the disabled. A chip implanted in your head. Technology makes man. Dream or nightmare?' Three years later, in 2007, the Rathenau Institute, a technology assessment body advising Dutch parliament, asked scientists and philosophers whether there should be limits to the engineering of 'makeable humans'. Yet another year later, an organisation called 'Makeable Man' (*De Maakbare Mens*), which describes itself as a 'critical movement for bio-ethics', invited entries for a photo contest about 'Sports and the makeability of humans' (www.demaakbaremens.org). Finally, Maastricht University has over the past few years offered its students a course entitled 'Makeable Man' in its Bachelor degree programme 'Arts and Culture'. This list could be continued ad nauseam; for example, by adding numerous magazine and newspaper articles that have addressed the issue.

The question is warranted whether a debate that covers such a broad range of heterogeneous practices can possibly be meaningful. Will it not necessarily mix up separate issues in a general scenario that, however unrealistic, is likely to engender only fear? The illustration on the programme flyer of the 'Homo Sapiens 2.0' festival displayed plastic mannequins, in a gesture towards a future in which human beings will be artificially produced that bear only a superficial resemblance to the humans they replace. The cover of the syllabus of Maastricht's bachelor course (Fig. 1.1) shows a picture of a drawer divided into many small compartments, which are filled with human heads, conjuring up the idea of a repository in which the engineers of humanity can store spare parts and from which, whenever needed, a replacement head can be taken out. In short, then, the suggestion is invoked that it will soon be possible to reform, perfect, standardise or indeed replace 'naturally evolved' human beings by engineered specimens. Since such a wholesale replacement presently belongs to the realm of fiction, not of fact, one may in fact wonder about the usefulness of such scenarios. Is it helpful to lump cloning, conditioned behaviour, anti-ageing techniques, cosmetic surgery and performance-enhancing drugs together and view them as so many stepping stones on our way towards the creation of artificial life? It could perhaps be more meaningful to highlight the generic differences, rather than stretching some similarities, between the following types of interventions: (1) enhancement of the existing functions; (2) methods of selection in the reproduction of human individuals and possible improvements of the genetic makeup of the embryo; (3) replacement or expansion of natural elements by artificial elements (from replacing organs to the creation of cyborgs); (4) methods designed to steer human behaviour; (5) the development of robots that increasingly resemble humans.

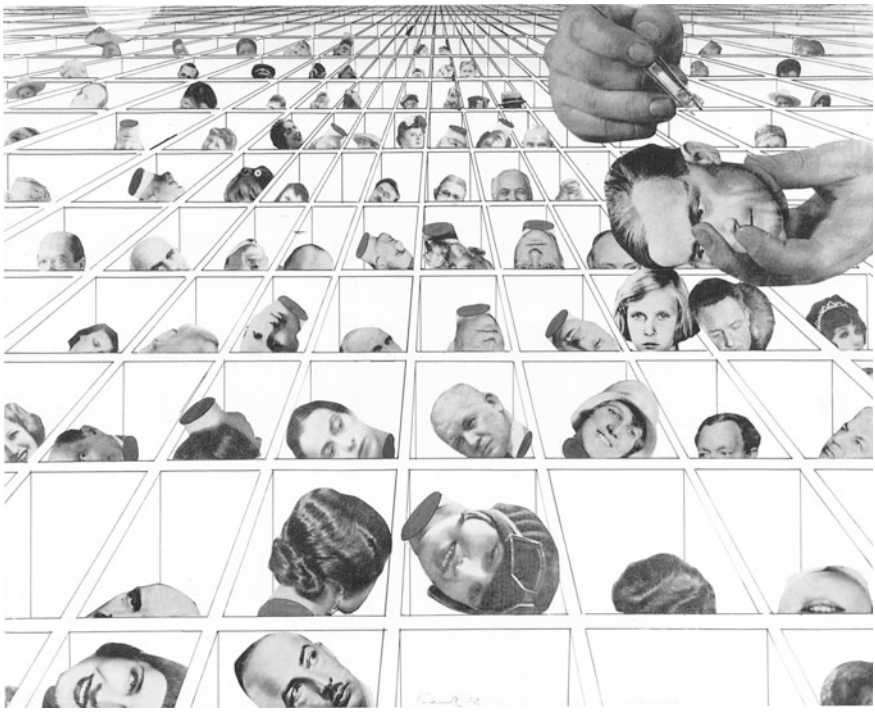

Fig. 1.1 Kurt Kranz, 'Kopfvorrat'. From: Barbara Auer, *Künstler mit der Kamera. Photographie als Experiment*, Mannheim, Vits and Kehrer 1994.

What Lies at the Core of the Debate?

The main reason for asking academics from a variety of disciplines, ranging from reproductive biology over artificial intelligence and law to the history of science, to reflect on 'makeable man' was exactly so as to gauge the coherence of the debate. When viewed from a number of scientific perspectives, do short- and long-term projections of technological, medical and scientific developments justify such a general and as yet hypothetical debate? Or is it driven by merely fictional scenarios that do not accomplish more than to give rise to unfounded hopes and fears and provoke distressingly unanswerable questions? Is 'the future of our selves' really at risk, as was suggested in the title of a 2002 advisory report from the Health Council of the Netherlands?

There are the optimists, cited at the beginning of this Introduction, who welcome the convergence of various human-related technologies in the coming decades and the advent of superman. Among the optimists are not only pioneering scientists such as Warwick (2003) or visionaries like Kurzweil (2005, 2006) but also ethicists such as Harris (2007) who claim a moral duty to enhance ourselves. Still on the optimistic side of the spectrum are those who, like lawyer Gavaghan (2007) in

Defending the Genetic Supermarket, use rational argumentation to challenge many fallacies used in the debate. Gavaghan (2007) argues that—barring really harmful consequences which are seldom proven to be realistic—individuals have the right to decide for themselves whether or not, and how, to engineer human life.

In the middle of the spectrum, we find those who think that it is our moral task rather to be conceptually ready with nuanced answers for all eventualities, irrespective of whether any of the prophecies will come true. This is the position, for example, of the German ethicist Gesang (2007) whose recent survey book, *Die Perfektionierung des Menschen*, attempts to find utilitarian answers to questions regarding the demarcation between desirable, and hence permissible, and undesirable and illegitimate alterations of human nature. The Oxford ethicist Glover (1984), in turn, tries to answer the question: *What Sort of People Should There Be?* He argues that there are certain aspects to human nature which might become stronger with the help of biotechnology rather than being threatened by it. The breadth of the middle ground is illustrated by the many contributions to the volume *Human Enhancement*. Its editors, Savulescu and Bostrom (2009), pp. 18–19, stress that the issue has moved from the realm of fiction to that of practical ethics. This implies that part of the debate should now focus on the specifics of disaggregated forms of enhancement, while another part needs to develop a long-term and big-picture perspective on the future of humanity.

At the pessimistic end of the spectrum, we find those who warn against the de-humanisation of humans. Kass (2002), chairman of the President's Council on Bioethics under the former US president George W. Bush, emphasises the fact that all important aspects of human life—including work, sexuality, food, rituals—are meaningless when they are placed outside of our traditional life cycle. In order to preserve meaning, we must, therefore, preserve this cycle from birth to death. For similar reasons, Fukuyama (2002) argues that human life will lose its meaning if we design out human suffering and bad luck altogether. After all, happiness is only possible if people know the meaning of unhappiness as well. Therefore, he considers the proposal to raise human beings to a new level with the help of biotechnology to be 'the world's most dangerous idea'. Dekker (2007), professor and molecular biophysicist at Delft University of Technology, agrees with Fukuyama (2002, 2004): 'This might sound like a drastic statement, but I agree with it'. After all, he continues, 'I support technology's commitment to heal human beings, but I object against the endeavour to improve humans out of a sense of hubris, which will lead to dangerous side effects'. Of these side effects, the most dangerous is, according to Dekker (2007), the loss of 'human dignity'. In a similar vein, Sandel (2007), pp. 96–97 in *The Case Against Perfection*, warns against the consequences of losing our 'openness to the unbidden' in engineering human life: we will no longer value natural gifts or show humility in the face of privilege, and we may lose the knack of improving the world around us if all we do is try to improve ourselves.

The pessimists do not tire of warning us of the impending loss of 'naturalness'. Even though it might be argued that human beings were driven from the paradise of 'naturalness' long ago, the current impression of a potential loss of naturalness

seems caused by the speed and intensity of progress in, particularly, the biotechnological domain. History shows that public debates are usually not caused by changes themselves, but rather by the speed at which these changes take place. Changes which happen slowly and almost imperceptibly tend to cause little resistance, while changes happening so fast that they become noticeable often incite public debate. As the historian Bess (2008) mentions in his study about the history of biological 'enhancement':

> This time around, however, the radical innovations are coming upon us suddenly, in a matter of decades. Contemporary society is unprepared for the dramatic and destabilizing changes it is about to experience, down this road on which it is already advancing at an accelerating pace.

Indeed, we live in a time of rapid technological innovations, not least in the biomedical field, which are often publicly financed and affect all areas of our lives. These changes are reflected in life statistics: we see a decrease in the number of infant deaths through the prevention of infections, and also an equally strong increase of average life expectancy. Economically, these changes are paired with a noticeable and still increasing use of the medical sciences. Culturally, they are expressed through the flourishing of a health culture and the glorification of 'body consciousness', an awareness of the body in general and our own, individual bodies in particular. Scientifically, these changes are both represented and pushed forward by an ever growing group of scientists and professionals in the life sciences.

It is precisely this conjunction of far-reaching changes in healthcare with achievements in such sciences as robotics and artificial intelligence that lies behind the diffuse but widespread fantasies of man-made man, of the artificially improved, eternally healthy and possibly immortal human being. It is the just-named combination of developments that endows the prophecies of the post-human *Übermensch* with a certain degree of credibility. After all, artificial intelligence, preimplantation genetic diagnostics, genetic engineering, drugs for the improvement of memory, concentration, alertness and mood, together with performance enhancers, plastic surgery, sex-change operations, prosthetic medicine, anti-ageing medicine and direct interaction between human beings and machines—these are all types of technological interventions that are already existent today, and they are starting to be combined in remarkable, often unimagined manners.

Between Fiction and Fascination

But again, how realistic are the different ideas of the future with which futurologically inclined scientists or visionaries confront us? What are the actual scientific and technological possibilities, and how will they further develop? What are the chances that current fictional ideas, based on the predictions of both futurists and pessimists, will become reality? Also, if we assume that some of these ideas

will become real, what will be the implications for society and individuals? These are questions to which the authors of this book have been asked to respond.

They have done so in a number of ways. One obvious way in which to address such a cluster of questions is by placing it in a historical perspective. Such a method manages to show that a good portion of our expectations and fears has a long history and that our concerns lose some of their urgency and seeming novelty when placed in a broader historical perspective. We need only mention Rostand's (1959) *Can Man Be Modified?* and Ramsey's (1970) *Fabricated Man* here to show that the participants in today's human enhancement debate are hardly discussing radically new issues. This method is used in some of the initial essays of this book. Some of the other contributions document, by contrast, that professionals who are actually working in fields that shape our human future do not consider the scenarios sketched by the prophets of human engineering to be realistic. A further method for dealing with this cluster of issues is the traditional approach of dividing the general discussion into thematic issues, such as prenatal diagnostics, artificial intelligence or human rights. Such an approach helps us understand that the supposed whole is bigger than the sum of the separate parts, but also that the individual parts are easier to understand on their own. This method is used either implicitly or explicitly by most authors in this book.

This book originated from the decision of a handful of members of The Young Academy (*De Jonge Akademie*), the younger sister of the Royal Netherlands Academy of Arts and Sciences, in collaboration with the Centre for Society and Genomics (CSG) of Radboud University Nijmegen, to get a better understanding of the ongoing debate surrounding the enhancement of humans and their possible transformation into post-humans. By combining the perspectives of many different disciplines, the authors hope to enhance (but not engineer) the international debate on 'makeable man'.[1]

Acknowledgments The papers in this collection were translated from the original Dutch by students of the MA Writing, Editing and Mediating at the University of Groningen. Publication of this volume was made possible through the generous financial support of The Young Academy (De Jonge Akademie). We are very grateful to Lydia ten Brummelhuis for her careful and dedicated work in editing the final manuscript.

[1] The Young Academy, established in 2005, counts 50 members, which have been selected for their academic excellence and international reputation, as well as their interdisciplinary background and methodology. Since The Young Academy includes representatives from all academic disciplines, the topic of this book appeared to be an ideal topic for a collective research project. The book project was made possible through a fruitful cooperation with the Centre for Society and Genomics (CSG) at Radboud University Nijmegen, which investigates the relationship between society and genomics.

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