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Editorial: Transhumanist Politics, Education, and Design

Jörgen Skågeby, Mattias Arvola, and Lina Rahm

In the imminent future, technological revolutions are likely to change societies, bodies and minds in more far-reaching ways than ever before in history. Perhaps, this historically recurring statement has always rung true, but the growing interest in the concept, preconditions, and implications of *transhumanism* also points to a potential radically altered human condition. Transhumanism can generally be described as a philosophy, a cultural movement and a growing field of study concerned with the future of humankind. More specifically, transhumanism is the belief in morphological freedom and the aspiration to enhance human abilities and attributes, and thereby transcend human biological and cognitive limits. As transhumanist technologies are coming closer to a point of realization (as opposed to existing mainly as imaginaries) the humanities and social sciences are also beginning to seriously ponder the implications of transhumanism, posthumanism and the tensions that arise in such, partly, overlapping fields. For this special issue we invited scholars to consider transhumanist politics, transhumanist education, and transhumanist design from a range of perspectives and with various focal points. Political issues of transhumanism is today visible not only in discussions in and about the World Transhumanist Association and the US Transhumanist Party, but also in more general social, ethical, and

moral debates around emerging technologies. Education continues to be an interesting aspect of a potential transhumanist future. Issues of access, upgrading, learning, and the very meaning of education in a world where new kinds of skillsets can be acquired through new (and contingent) means, come into question. Naturally, the design of such technologies, and the policies they embody, will also become an important point of convergence, in need of rigorous examination.

This special issue of Confero takes its start in an essay by John Mazarakis who presents an overarching perspective on the underpinning politics of transhumanism. Considering theoretical debates and differences in the transhumanist movement over the last two decades, Mazarakis proposes the emergence of two distinct political stances: the techno-progressive and the techno-libertarian. Using Lyotardian concepts, Mazarakis questions the latent legacy of 'the grand narratives of modernism' and their potential to function as a basis for theorizing a transhuman future.

Continuing the discussion of transhumanist politics, in the next essay Steve Fuller puts the focus on morphological freedom, specifically discussing issues of responsibility and representation. Transhumanists have defined morphological freedom as an extended right to one's body, including the right to modify oneself according to one's desires using technologies such as surgery, genetic engineering, nanotechnology, and uploading. Taking its starting point in the transhumanist bill of rights and Lockean concepts of personhood, the essay discusses the philosophical (and practical) implications of taking the full meaning of morphological freedom seriously.

Morphological freedom notably includes both a potential range of possible individuals (as differently enhanced via morphological freedom) a well as a diverse range of potential (or imagined) transhumanist technologies. In his essay, Skågeby provides an overview of how various such 'imaginary media technologies' have spurred speculative visions of a transhumanist future. The essay argues that such imaginary media illustrate how human-

technology relationships and their temporal interrelations have been (and are) expressions of various desires both in the past, the present, and towards the future.

Next, through a parallel reading of the film *Surrogates* together with its accompanying short documentary *A more perfect you: The science of Surrogates,* Parisi considers the interpenetrating themes of the human, tactility, and the technological mediation of the body. By relying on, in the first case, diegetic prototypes of haptic media, and in the second one, the splicing together of fictional and real news footage, the films shows 'surrogate technology' as an imminent outcome of contemporary developments in cybernetics, making a seamless, and diegetically normalized, human-machine interface appear credulous. Parisi goes on to discuss how *Surrogates* raises crucial questions about the possibilities and limitations of synthetically reconstructing and extending touch, speculating on the potential sociological consequences of this act of technological mimesis.

Taking a detailed look at a different future technology, so-called care robots, Koistinen considers both utopian and dystopian technological futures and argues that speculative representations of care-robots can be used to make visible the problems as well as promises inherent in close relationships between humans and machines. By providing a number of evocative examples Koistinen points to the necessity of an enhanced dialogue between the human and non-human dimensions of robots.

Finally, Berg, Fors and Eriksson explore the relationship between biohacking and transhumanism, drawing on a focused ethnographic engagement with an "Upgraded dinner" workshop at the 2015 Biohacker Summit in Helsinki, Finland. Through an ethnographic account, the authors discuss how the reconfiguration of the practice of cooking into a transhumanist form can be conceptualised as a tension between mastery and mystery, which in turn relates to notions of aesthetics, medicine and alchemy. As such, the authors demonstrate that contemporary transhumanism is not always a question of cybernetics, DIY science and technologically enhanced life, but

can also be viewed as something that goes beyond technological revolutions and instead relates to a more ancient legacy.

Design is policy embedded in silicon. Algorithms, as both (pre-)programmed and (re-)programmable, are instantiations of political positions. Or rather, the decisions they make or support will have political implications. Our right to education ties into these inherently political technologies - technologies that will also be increasingly co-agential in our everyday lives. As such, our right to education is also a matter of the preconditions of this right, and consequently, about the access to, and designed agency of, transhumanist technologies. As we begin to explore our extended, enhanced and substituted selves, our relations to others will create new dilemmas to consider. This special issue of Confero discusses and explores such dilemmas and we hope readers will find the included essays as evocative and thought-provoking as we have.

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The grand narratives of democratic and libertarian transhumanism: A Lyotardian approach to transhumanist politics

John Mazarakis

During the last two decades, the growing interest in human enhancement technologies has taken on political dimensions. Transhumanism, as "the intellectual and cultural movement that affirms the possibility and desirability of fundamentally improving the human condition through applied reason […]" [1] raised – both from right and left-wing bioconservatives – numerous ethical issues, concerning social and political fields. The bioprogressive answers to those questions were neither homogeneous, nor totally compatible with each other. Consequently, since the late nineties, a series of events and theoretical debates lead to the gradual emergence of two distinct political stances inside the transhumanist movement: the techno-progressivism and the techno-libertarianism.

Despite their shared belief in the potential of technology to radically improve human life, transhumanists across various political platforms have differing visions of the future of humanity. Libertarian transhumanists envisage a future society were every individual will have the right to alter, transform and extend its biological form, free from any type of state

[1] "What is Transhumanism?" www.whatistranshumanism.org. [Retrieved 15 May 2016].

intervention or oppressive, government regulation. As Ben Goertzel notes in *The Path to Posthumanity,* "the fusion of radical technological optimism with libertarian political philosophy […] one might call it libertarian transhumanism"[2]. In the contrasting vision of techno-progressivists lies a society in which all citizens will have equal access to human enhancement technologies through a specific type of public policy which will reassure social equality based, for the fist time in human history, on biological equality:

> We are no longer content simply striving for social, economic, and political equality. What do these rights mean so long as people are born biologically unequal? So long as some are born strong others weak, some healthy others sickly, some beautiful others ungainly, some tall others short, some brilliant others dumb - in other words so long as we do not have biological equality- all social equalities mean very little. We will settle for nothing less than [the conquest of] this basic biological inequality which is at the very root of all human inequalities.[3]

In a manner similar to feminist politics (which range from individualist feminism to Marxist and anarcho-feminism) and to other branches of identity politics, the term 'transhumanist politics' involves a wide variety of political stances which controversial as they might be, focus on this new, technologically altered type of (post)human identity and its best potential, social environment.

However, both of those major political ideologies inside transhumanist politics are based on traditional notions of the political subject and its core features, which characterize the 'old-fashioned', biological and not fully altered human. Since the posthuman subject still exists only in the sphere of speculative fiction, every attempt to hypothetically place it inside a concrete system of political organization is, at least, pointless. The humanist presuppositions upon which both libertarianism and

[2] Goertzel and Bugaj, 2000, p. 393.

[3] FM-2030, 1970 in Hughes, 2004, p. 195.

progressivism are based could not remain unaltered while the subject matter of humanism itself undergoes radical transformations. This new type of post-human, or post-citizen, cannot be circumscribed by the narrow limits of the preexisting political systems. This paper will focus on the above mentioned theoretical systems of transhumanist politics, their roots on the, already fallen, Grand Narratives of modernity and the disruptive advent of the posthuman which should eventually lead to the creation of new political and social discourses. Following Lyotard's argument about the fall of the Grand Narratives, the paper poses an important question concerning the ends of transhumanist politics: Is it possible for transhumanism to maintain the ends of the modernist metanarratives and enforce them through technology, in a postmodern world of delegitimization?

Transhumanism and modernity

In his 2003 article *Transhumanist Values*, Nick Bostrom delineates the basic principles of transhumanist thought by defining transhumanism as an interdisciplinary movement which aims to the acceleration of human evolution through technological means. The overcoming of our biological limitations will lead into the widening of the spectrum of our possible modes of Being, where alternative ways of existence will become accessible by posthumans. As he notes:

> Transhumanism promotes the quest to develop further so that we can explore hitherto inaccessible realms of value. [...] There are limits to how much can be achieved by low-tech means such as education, philosophical contemplation, moral self-scrutiny and other such methods proposed by classical philosophers with perfectionist leanings, including Plato, Aristotle, and Nietzsche, or by means of creating a fairer and better society, as envisioned by social reformists such as Marx or Martin Luther King. This is not

> to denigrate what we can do with the tools we have today. Yet ultimately, transhumanists hope to go further [4]

In this passage, a brief description of what Jean-François Lyotard calls the Grand Narratives of modernity is easily detected: the speculative grand narrative and the grand narrative of emancipation. The idealistic conception of truth, which can be grasped through the dialectical expansion of knowledge, is a philosophical ideal which permeates the history of philosophy since Plato and finds its most detailed expression in Hegelian philosophy of Spirit. However, after the French Revolution, knowledge is reevaluated and gains a whole new purpose: to set humanity free either from religious oppression (Enlightenment) or from capitalistic exploitation (Marxism). Knowledge as an end in itself becomes the basic instrument of global emancipation; "knowledge is no longer the subject, but in the service of the subject"[5]. Those two models of knowledge seem to share a common grounding and a similar structure. First of all, both of them start from the idea of the linear-progressive history of humanity which will lead, eventually, in a future where all the contradictions (either idealistic or materialistic in nature) will be resolved. The realization of universal self-consciousness and the communist utopia function as the final stage of human and social evolution; distant but graspable through specific educational systems, public policy or collective actions.

In order for humanity to reach this higher state of existence or to accelerate toward a fairer society, "all the different areas of knowledge […], all the social institutions such as law, education and technology combine to strive for a common goal […]."[6] And this type of institutional organization is political in nature; political philosophy is almost always related with metanarratives concerning the progress of mankind.

[4] Bostrom, 2005, p. 9.
[5] Lyotard, 1984, p. 36.
[6] Malpas, 2003, p. 27.

> The thought and action of the nineteenth and twentieth centuries are governed by an Idea (I am using Idea in its Kantian sense). That idea is the idea of emancipation. What we call philosophies of history, the great narratives by means of which we attempt to order the multitude of events, certainly argue this idea in very different ways [...]. But they all situate the data supplied by the events within the course of a history whose end, even if it is out of reach, is called freedom[7]

Transhumanism, according to Bostrom, constitutes no exception: its main goal is to promote a series of enhancements through which most of our current physical constraints will be reduced, our way to a posthuman mode of Being will be accelerated, greater amount of knowledge will become accessible and fairer social coexistence will become attainable. In an attempt to avoid criticisms about the utopian aspect of transhumanism, Bostrom notes:

> Transhumanism does not entail technological optimism. While future technological capabilities carry immense potential for beneficial deployments, they also could be misused to cause enormous harm, ranging all the way to extreme possibility of intelligent life becoming extinct[8]

Although he refers to the potential dangers that such enhancements may evoke for humanity, Bostrom does not seem to challenge the modernist ideal of a universal metalanguage, which will legitimize all the other 'language games' and organize them in order for humanity to achieve its ultimate purpose. On the contrary, technology, as a more concrete version of scientific knowledge, becomes the basic instrument both for its self-expansion and consequently the design of a better society. However, according to Lyotard, both speculative and emancipatory metanarratives failed to map the complexity of the postmodern world. The speculative hierarchy of knowledge and the prioritization of the scientific discourse was replaced by "an

[7] Lyotard, 1989, p. 315.

[8] Bostrom, 2005, p. 4.

immanent and […] 'flat' network of areas of inquiry, the respective frontiers of which are in constant flux"[9] and the emancipatory legitimization has already been proved insufficient since "there is nothing to prove that if a statement describing a real situation is true, it follows that a prescriptive statement based upon it (the effect of which will necessarily be a modification of that reality) will be just"[10] . The Lyotardian linkage between the disorienting effects of the contemporary technological evolution and the delegitimization of the Grand Narratives of modernity passes unnoticed in Bostrom' s warnings about the possible misuse of technology, which, still, remains "in large part responsible for the evolution of […] basic parameters of the human condition […][11].

The inherent link between transhumanism and the modernist ideals of progress provides the ground upon which transhumanist politics will be formed. Both libertarian and democratic transhumanism are structured in the context of "the narrative of emancipation (which) gives hope to people that one day they will be free or that their situation will be better"[12]. However, the self-destruction of the grand narratives of modernity has already happened: Auschwitz, Prague 1968, Paris 1968 and the economic crises of 1911, 1929 and 1974-9 are only some of the historical events which signify the collapse of the grand narratives. The reconciliation between radically different language games through a transcendental illusion is possible but has a price - and "the price of this illusion is terror. The nineteenth and twentieth centuries have given us our fill of terror"[13]. All those political movements which presented the world as a well-organized system, ended up in suppressing and wiping out anything that did not fit into these systems. And, according to Lyotard, at this point, the link between meta-narratives and totalitarianism becomes more than evident.

[9] Lyotard, 1984, p. 39.
[10] Lyotard, 1984, p. 40.
[11] Bostrom, 2006, p. 2.
[12] Schultz, 1998.
[13] Lyotard, 1992, pp. 15-16.

Although Grand Narratives still exist and affect our society their legitimizing power ceases while the figural energy of the postmodern renders them inadequate to represent and contain us all. The simultaneous coexistence of the metanarratives and the

postmodern "incredulity towards (them)"[14] is not marking a contradiction in Lyotard's thought: "the postmodern does not replace a worn out modernity, but rather recurs throughout modernity as a nascent state [...] of modernist transformation"[15]. This transformation of modernism, according to Lyotard, eventually leads to an urgent need for micronarratives which will replace metanarratives in contemporary cultural and political thought - a need which has not yet been fulfilled by transhumanist politics.

The Grand Narrative of Libertarian Transhumanism

Although the term 'transhumanism' was first used in the mid '60s by the futurist F. M. Esfandiary in the context of his lectures on futurism at the New School of Social Research, it was not until the foundation of Extropy Institute in 1992 by Max More and Tom Bell that transhumanism transformed into a fully formed ideology. Starting as a network of transhumanists which would interconnect various ideas about human enhancement all over the world, the Extropy Institute focused also at the formation and the promotion of a small set of transhumanist values which would express clearly the spirit of extropianism[16]. The

[14] Lyotard, 1984, p. xxiv.

[15] Malpas, 2003, p. 43

[16] Extropianism, as an intellectual movement, is based on the principles of Extropy which "outlines an alternative lens through which to view the emerging and unprecedented opportunities, challenges, and dangers. The goal was – and is – to use current scientific understanding along with critical and creative thinking to define a small set of principles or values that could help make sense of the confusing but potentially liberating and existentially enriching capabilities opening up to humanity." More, 2003.

publication of its five basic principles in the first issue of *Extropy* in 1988 signified the transition from an abstract set of ideas on human enhancement through technology to a concrete ideological system with specific social and political purposes. According to the fifth principle of this early version of More' s manifesto, named 'Spontaneous Order', Extropianism supports "decentralized, voluntaristic social coordination processes […] (and fosters) tolerance, diversity, foresight, personal responsibility and individual liberty"[17].

In his 2004 book *Citizen Cyborg,* James Hughes argues that the 'Spontaneous Order' principle "distilled their belief, derived from the work of Friedrich Hayek and Ayn Rand, that an anarchistic market creates free and dynamic order, while the state and its life-stealing authoritarianism is entropic." [18] The anarcho-capitalist rejection of the paternalistic role of the state in favor of individual sovereignty can be detected in several articles of the *Extropy* journal until the end of the 90s. However, through the years, extropianist network started to gain a wide and divergent group of followers; the internal and external criticisms of its extreme, anarcho-capitalist tendency was unavoidable and gradually lead to a more moderate version of libertarian transhumanism. In 2000, Max More abandoned the 'Spontaneous Order' principle and replaced it by the following:

> Open Society: Supporting social orders that foster freedom of speech, freedom of action, and experimentation. Opposing authoritarian social control and favoring the rule of law and decentralization of power. Preferring bargaining over battling, and exchange over compulsion. Openness to improvement rather than a static utopia[19]

Other technolibertarians, however, choose to express their political beliefs in more direct ways. For example, Ron Bailey, in his review of Hughes' work *Citizen Cyborg*, argues:

[17] More, 1993.
[18] Hughes, 2004, p. 166.
[19] More, 2003.

> Where Hughes goes wrong is in fetishizing democratic decision-making. He fails to recognize that the Enlightenment project that spawned modern liberal democracies began by trying to keep certain questions about the transcendent out of the public sphere. Questions about the ultimate meaning and destiny of humanity are private concerns. Worries about biotechnological progress must not be used as excuses to breach the Enlightenment understanding of what belongs in the private sphere and what belongs in the public. […] Hughes understands that democratic authoritarianism is possible, but discounts the possibility that the majority may well vote to ban the technologies that promise a better world.[20]

What Bailey suggests in the above mentioned passage is that, according to the Enlightenment project, the metaphysical statements concerning the destiny of humanity should be abolished (or, at least kept in the private sphere) in order for humanity to be emancipated. The mythical aspect of all those statements is highlighted by science and their "[…] narrative function is losing its functors, its great hero, its great dangers, its great voyages, its great goal."[21] The death of religion, or other authoritarian systems of thought, as the absolute regulators of meaning in a society, is accompanied by the enforcement of various discourses as the independent guarantees of pragmatism.

However, Lyotard argues that the radical heterogeneity between all those 'language games' in the contemporary, capitalist world, is, once again, regulated according to one single principle:

> The decision makers […] attempt to manage these clouds of sociality according to input/output matrices, following a logic which implies that their elements are commensurable and that the whole is determinable. […] In matters of social justice and of scientific truth alike, the legitimation of that power is based on its optimizing the system' s performance - efficiency. The application

[20] "Trans-Human Expressway: Why libertarians will win the future" http://reason.com/archives/2005/05/11/trans-human-expressway [Retrieved 15 May 2015].
[21] Lyotard, 1984, p. xxiv.

> of this criterion to all of our games necessarily entails a certain level of terror, whether soft or hard: be operational (that is, consumerable) or disappear[22]

In late capitalism, the role of state and its capacity to intervene in social and economical issues is already limited: multi-national corporations have become the key-players of the decision making processes all over the Western world and their power is based on the commodification of scientific knowledge. The fall of previous, metaphysical grand narratives was followed by the rise of a new one, whose basic goal is to provide the necessary legitimacy in contemporary, scientific knowledge. In the context of capitalism, everything is evaluated according to its financial value and the legitimacy of all 'language games' derives from the main, capitalist principle of efficiency.

In libertarian transhumanism, the authoritative role of capitalism is more than evident: due to a radical shift from ends to means, technological progress functions as the absolute meta-language: "[...] (the) language that takes for itself the right to legislate meaning across incommensurable regimes of phrases, never realizing it is utterly trapped within its own"[23]. The demands for social and economic equality are treated as parts of a fictitious, utopian project which disorientates humanity's way towards to its final destination: the creation of the New Man, a being capable of transcending every biological limitation. This highly technological romanticism and its tendency to reduce everything to its own agenda bears many similarities with the majority of the totalitarian political regimes of the past.

The only way to avoid the totalizing effects of any type of metanarrative, according to Lyotard, comes through the acceptance of the fact that "there is no knowledge in matters of ethics. And therefore there will be no knowledge in matters of politics" [24] . In contrast with libertarian transhumanism,

[22] Lyotard, 1984, p. xxiv.
[23] Mann, 2006, p. 73.
[24] Lyotard and Thébaud, 1985, p. 73.

Lyotardian *pagan politics* reject the modernist hierarchy of knowledge and celebrate the diversity between the various discourses and genres of utterance. Where libertarian transhumanism attempts to update the previous political thought in order to fit it into our hyper-technological future, Lyotard proposes the constant destabilization of previous (political) systems and the creation of new rules of judgment. In pagan politics, "political progress consists either in inventing new moves within old games, in refining and modifying established rules, or in inventing new rules"[25]. And those moves are not based on 'universal' criteria of ethics and justice or on *sensus communis* but on our affective responses: "I mean that, in each instance, I have a feeling, that is all. It is a matter of feelings, however, in the sense that one can judge without concepts"[26].

In his article *Cyber-Communism: How the Americans are Superseding Capitalism in Cyberspace,* Richard Barbrook describes a similar 'feeling' experienced by Internet users, who, although live in capitalist systems, choose to exchange information as gifts. As Barbrook notes, "quite spontaneously, people are adopting more democratic methods of working together in cyberspace"[27]. This spontaneous tendency to share freely information through the Net is supported by the technological evolution which renders the reproduction and the distribution of information easier and cheaper. In Lyotardian terms, the gift economy of the Net is a 'pagan' respond to the new communicative practices, which is not regulated by the rules of capitalism; a new move within an old game, a sensus communis which appears as a result of a spontaneous feeling and not as regulatory, ethical principle. However, in this point, an important question raises: Is democratic coexistence possible only through the spontaneous feeling of its citizens or can it be regulated in a more strategic way?

[25] Fairfield, 1994, p. 60.
[26] Lyotard and Thébaud, 1985, p. 15.
[27] Barbrook, 2000.

The grand narrative of democratic transhumanism

In contrast with Barbrook, Hughes express his doubt about the adaptive capacity of people in radical changes, which affect their everyday lives. He refers to Alvin Toffler' s notion of 'future shock', "the shattering stress and disorientation that we induce in individuals by subjecting them to too much change in too short a time"[28] and adopts his main theoretical point that people, most of the times, experience severe uncertainty and discomfort when they are exposed in entirely new living conditions. Opposed to Lyotard' s *paralogy,* as the spontaneous creation of new rules that will fit to the new social circumstances, Hughes and Toffler describe the human tendency to avoid change or being confused by it. However, Hughes is not a pessimist: people eventually adapt. He is using as an example the process of the legalization of gay marriage across Europe and the USA and he concludes "the logic of democracy will make laws against gay marriage seem as curious and wrong-headed as laws against interracial marriage are seen today"[29].

In transhumanist politics, democratic tendencies make their appearance in late 90s, when Nick Bostrom and David Pearce organized the World Transhumanist Association (WTA) as an international organization focusing on promoting transhumanism as an academic field of scientific inquiry. In his "Transhumanist Declaration", Bostrom takes distance from Extropians' extreme techno-optimism and refers to the possible catastrophic consequences which accompany the technological evolution as well as the existential risk posed to humanity by those advanced technologies. The extropian belief in the autoregulation of the market is replaced by the need of a social order where responsible decisions can be implemented; a certain type of anticipatory democracy, which will take into account the possible threats of technological evolution and prepare the public for the upcoming changes. According to Hughes:

[28] Toffler, 1965, p. 110.
[29] Hughes, 2004, p. 59.

> With the Declaration transhumanists were reembracing their continuity with the Enlightenment, with democracy and humanism, and setting aside the antisocial, free-market anarchism that had briefly held sway in transhumanist circles in the unique circumstances of mid-1990s bubble economy, South California-based, net culture [30]

And while libertarian transhumanists focus mostly on Enlightenment' s ideal of liberty, democratic transhumanists struggle also for equality and solidarity. A democratically regulated technology could become the best way of achieving equality and justice by rejecting the biological bases of social inequality. Most of the biological traits which predict a balanced and successful life (like physical and mental health, intelligence, longevity, etc.) could become accessible by most of the future citizens through genetic enhancement while gender inequality could be faced by technologies that will free women from specific anatomic traits which, at our patriarchal society, render them socially vulnerable (more evolved reproductive technologies, artificial wombs, etc.). Finally, according to Peter Singer, technology could contribute to the creation of citizens which will be freed from their selfish nature and will therefore become more suitable for a democratic society:

> In a more distant future we can still barely glimpse, it may turn out to be a prerequisite for a new kind of freedom: the freedom to shape our genes so that instead of living in societies constrained by our evolutionary origins, we can build the kind of society we judge best [31]

Could this kind of freedom be the object of a universal desire though? Could it be a utopia for mankind on the whole? "For Lyotard, as a post-Marxist, the pattern of thought which founds a communal subjectivity and self-determination has become problematic"[32]. According to his own words:

[30] Hughes, 2004, p. 178.
[31] Singer, 1999, p. 366.
[32] Pulkkinen,1988, p. 133.

> There is no libidinal dignity, nor libidinal fraternity, there are libidinal contacts without communication (for want of a 'message'). This is why, amongst individuals participating in the same struggle, there may exist the most profound miscomprehension, even if they are situated in the same social and economic bracket[33]

Every action, every struggle, every "movement in the game" is the result of a desire, or, in Lyotardian terms, *jouissance*. This desire, which has a strong sexual, possessive aspect, is unstable, fluid and cannot, in any case, be directed by abstract ideas. Any society and any political economy "is prey to an open set of heterogeneous desires"[34] and there is no transcendent, privileged realm of ethics or political ideals that can regulate and manage those libidinal energies. There is not, and there cannot be, a sensus communis, a commonly shared belief, universal and permanent, which will define the most beneficial route of humanity' s progress.

> There are only encounters, each tracing at full speed around itself a multitude of transparent walls, secret thresholds, open grounds, empty skies in which each encounter flees from itself, overflows itself, is forgotten - or is repeated, ceasing then to be an encounter. This latter does not return, does not reproduce itself [...][35]

In Singer' s vision of a future society, where citizens would be genetically suitable for his (ours?) notion of freedom, we could easily detect the same tendency of assimilating and neutralizing heterogeneity, which Lyotard describes as the basic characteristic of the capitalist "vanguard machine" that drags "humanity after it, dehumanizing it in order to rehumanize it at a different level of normative capacity"[36]. If libertarian transhumanism' s goal is to maximize the efficiency of human nature in order to achieve higher (according to a specific, modernist hierarchy) states of

[33] Lyotard, 2004, p. 111.
[34] Williams, 2000, p. 29.
[35] Lyotard, 2004, pp. 34- 35.
[36] Lyotard, 1984, p. 63.

existence, in democratic transhumanism, "the human ceases to have the capacity to be surprising or strange and is reduced to just another cog […]"[37] in the utopian system of absolute freedom, equality and solidarity. In both cases, the posthuman is treated as a medium in order for humanity (as an homogenous set of individuals) to achieve ethical or existential goals, which are rooted in specific types of philosophical and political systems of thought. Due to his deep "incredulity towards metanarratives", which characterizes the postmodern thought, Lyotard criticizes this type of technological "inhuman" as the result of their homogenizing, intellectual totalitarianism. However, he suggests another type of inhuman which bears "the potential of being taken hold of by surprising and uncanny transformative possibilities that cannot be predicted, explained or mastered by technologically-based systems of reason"[38]

The posthuman, the inhuman, and the transhumanist politics

In the introduction of his essay *The Inhuman: Reflections on Time* (1988), Lyotard detects the above mentioned capitalist principle of efficiency in the anti- avant-garde tendency of the contemporary culture: "Be communicable, that is the prescription. Avant-garde is old hat, talk about humans in a human way, address yourself to human beings, if they enjoy receiving you then they will receive you"[39]. The capitalist art market needs art which has the capacity to appeal to a mass audience in an easy, quick and pleasant way. Consequently, art looses its inherent incommensurability; it is transformed into another saleable commodity and paradoxically, by talking to 'humans in a human way', becomes part of the dehumanizing vanguard machine of capitalism. However, Lyotard argues that art can also talk in an *inhuman* way- it always retains its capacity of producing "surprising and uncanny transformative

[37] Malpas, 2003, p. 90.
[38] Malpas, 2003, p. 91.
[39] Lyotard, 1991, p. 2.

possibilities that cannot be predicted, explained or mastered by technologically-based systems of reason"[40]. As he notes:

> (There are) two sorts of inhuman. It is dispensable to keep them dissociated. The inhumanity of the system which is currently being consolidated under the name of development (among others) must not be confused with the infinitely secret one of which the soul is hostage. […] The system […] has the consequence of causing the forgetting of what escapes it. But the anguish is that of a mind haunted by a familiar and unknown guest which is agitating it, sending it delirious but also making it think - if one claims to exclude it, if one doesn' t give it an outlet, one aggravates it.[41]

This type of inhuman possesses most of the characteristics that Lyotard attributes to postmodern thought, throughout his whole work: it is figural, (*Discourse, Figure*), libidinal (*Libidinal Economy*), incommensurable (*The Differend*) and sublime (*An Answer to the Question: What is the Postmodern?*). It carries an entirely new energy which cannot fit in the old theoretical schemes and seeks for a 'pagan' respond – a judgment without preestablished criteria. It is vulnerable, because of systems' tendency to obliterate all those elements that do not fit in it, and, at the same time, powerful, because of its capacity to disrupt, subvert and transform the established metanarratives of any society. In contrast to Habermas' need for completing the 'unfinished project of modernity', Lyotard' s postmodern thought focuses on this 'inhuman' discontinuity with the past and the paralogical, "ongoing creation of meaning […] (which) can awaken our minds to an unending expansion of new ideas"[42].

Both in libertarian and democratic transhumanism, the posthuman is treated as an updated version of the human: although more developed and improved, the posthuman still pertains to the well-known intellectual being which created this civilization through his reasonable thinking and the power of its

[40] Malpas, 2003, p. 91.
[41] Lyotard, 1991, p. 2.
[42] Shawver, 1996.

will. From this perspective, the transhumanist attempts of predicting its social behavior and political activity are justifiable and necessary. If the posthuman is the unavoidable next step of our (linear) evolutionary progress, then the philosophers' task could not be anything else than previsioning the best social and political environment inside which this huge ontological transformation will be realized.

However, leaning on Lyotard, this type of previsioning is exactly what postmodern thought should avoid: instead of creating criteria which will guide our response to future events (and which will, unavoidably, be expressed in terms of a metalanguage), we should prepare ourselves to judge without criteria: to confront the sublimity of the post- or inhuman and invent new 'language games' which will be compatible with its unique characteristics. The advent of the posthuman will have the form of an Event:

> (A)n instant in which something happens to which we are called to respond without knowing in advance the genre in which to respond. [...] the event is what calls for a response, a judgment, which respects its specificity and refuses simply to fit it into a pre-given scheme[43]

Instead of pre-schematizing the posthuman identity and adapting it in already existent political and social systems, transhumanists should start considering its inhuman (in the Lyotardian sense) aspect and re-evaluate their modernist visions about humanity' s destiny. In a postmodern era, when every political and philosophical theory is being relativized, the already established systems of thought could not function as a legitimate base upon which we can stand and stare at the future. The advent of the posthuman or the singularity or the A.I., with their updated physical and mental capacities, could mark both the end of postmodernism, by providing us with answers to questions which might currently seem metaphysical, and with the practical realization of the postmodern deconstruction of everything that seemed to be solid and unquestionable. In front of this radically

[43] Malpas, 2003, p. 101.

new phase in the history of mankind, every attempt of adapting the post- or in-human in our political visions is, at least, useless (if not dangerous): our only choice is to adapt the latter in the new, posthuman condition.

Conclusion

The purpose of this essay has been to present trends in contemporary transhumanist politics, examine them through Lyotard's postmodern ideas and expose their problematic reliance on modernist ideals. In the introduction, the transhumanist belief in a higher state of Being which is achievable through technology was presented as an updated version of the speculative and the emancipatory metanarratives of modernity. In the case of libertarian transhumanism, the rejection of the state as an absolute regulator of social order marks the rise of a new, capitalist metanarrative which is based on a principle of efficiency. In democratic transhumanism, the prioritization of social equality and the need to design citizens who will be genetically suitable for a fair society ends up in a systematic neutralization of heterogeneity. Both libertarian and democratic transhumanism have their theoretical roots in the (fallen) modernist grand narratives, which still affect expectations regarding the future of humanity. The liberal ideal of autonomy and freedom and the democratic struggle for equality have been proven to contain the seeds of the totalitarian tendencies which have afflicted civilization over the last centuries. According to Lyotard, to escape from them one needs to embrace our limited capacities of theorizing the Event as well as to create new 'language games' which can replace old, insufficient ones. However, it is crucial to note that the discourse on transhumanist politics has two main tasks: to provide a vision of our posthuman future and to regulate the transition from human to posthuman in political and social terms; two tasks distinct from each other, but not unrelated. Still, according to Lyotard, both libertarian and democratic posthuman utopias seem to be metanarrative and problematic, the regulation of the production and the distribution of new technologies of human enhancement remains

a practical problem that should be examined in the context of the already existing 'language games'. From this perspective, transhumanist politics should emphasize a case-by-case type of judgment, in petit récits, which, while still affected by our current moral values, will mark:

> (T)he acceptance of the fact that one can play several games, and that each of these games is interesting in itself insofar as the interesting thing is to play moves. And to play moves means precisely to develop rules, to set the imagination to work[44]

Transhumanist politics can function as either metalanguages or as language games. In the former, manifestos will present us with totalities that can only be sustained by eliminating difference. In the latter, the lack of universal criteria will lead us to embrace the sublimity and incommensurability of the posthuman and respond to it in a paganist way.

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Morphological Freedom and the Question of Responsibility and Representation in Transhumanism[1]

Steve Fuller

On the 14th of December 2015, US Transhumanist Party founder and 2016 presidential candidate, Zoltan Istvan presented the 'Transhumanist Bill of Rights' to the Capitol in Washington, the seat of the US Congress (Transhumanist Party 2015, republished as an Appendix). The Bill consists of six articles which range over the movement's favourite topics, such as life extension and space exploration. It politically channels the metaphysics that informed Norbert Wiener's original manifesto on cybernetics[2], which argued that humans, animals and machines could be understood under the same set of dynamic equations which describe self-regulating systems. However, what makes the Transhumanist Bill of Rights distinctive is its explicit commitment – in Article 3 – to *morphological freedom*, the right to be as one wishes as long as it does not interfere with anyone else's right to act similarly.

For transhumanists, morphological freedom is generally understood as John Locke's egalitarian liberal conception of the personal agency taken to its logical conclusion, even beyond

[1] I would like to thank Felipe Figueroa Zimmermann for his research assistance concerning brain v. computer energy use

[2] Wiener, 1948.

what the great late libertarian philosopher Robert Nozick had imagined[3]. Whereas Nozick presumed that we are free to *do* whatever we want (as long as others' freedom is not restricted in the process), transhumanists presume that are also free to *be* whoever we want. In the current political scene, this radical sense of 'ontological liberty' has served to make transhumanists natural allies of transgender activists, perhaps most notably the mind uploading advocate, Martine Rothblatt[4].

Nevertheless, morphological freedom is not quite the incremental extension of Locke's doctrine as its proponents claim. Locke's theory of the person was predicated on the rough natural equality of all members of *Homo sapiens*. By this he did not mean that we are all born with the same capacities, but rather that we are born with a similar distribution of capacities in the sense that we were all by nature equally empowered and equally vulnerable – albeit in different respects, depending on the individual profile. In effect, we need each other equally; a conclusion that reason permits us to draw if we are given the opportunity to think about the matter. Commentators on Locke's political philosophy tend to stress the idealized character of this metaphysical basis for the social contract. However, Locke's assumption about the distribution of human capacities is a rather empirical one – one which transhumanism's doctrine of morphological freedom throws into question.

The counter-transhumanist empirical assumption, which underwrites Locke's liberal basis for the social contract, is that we are deeply finite creatures. By 'deeply finite', I mean that our limits are multiple and ultimately insurmountable. The main limit is, of course, mortality – but there are also limits to our capacities and the way they interact with each other within our bodies, as well as how we then interact with similarly embodied

[3] Nozick, 1974.
[4] Fuller and Lipinska, 2016.

beings. In this context, Locke's famed 'forensic' conception of the person should be understood as the formal locus of decision-making which resolves these tensions by committing to some course of action for which the 'person' may then be held responsible. In this respect, personhood is required to limit both the credit and blame assigned to deeply fallible beings. Prior to Locke, families and corporations (e.g. states, churches, universities, etc.) held personhood – and individuals became persons by virtue of their membership in one of these entities.

Locke's legal modernism lay precisely in his associating personhood with features unique to individuals rather than common to their member groups. This gives 'personhood' a radically different look, something which we too easily take for granted – and could well become lost in the enthusiasm for morphological freedom. Prior to Locke, when either you inherited your personhood (as, say, a noble or a serf) or acquired it through election (as, say, a citizen or a cleric), you were provided with a sphere of freedom and liability which was semi-detached from what you actually did. Thus, a noble and a serf who each committed murder would be typically tried differently, regardless of the physical and psychological similarities of the two crimes. A noble might be dealt with discretely and be allowed to negotiate a settlement for the crime, whereas serfs in general might be rounded up and imprisoned until one of them confessed to the crime.

Habeas corpus, a hallmark principle of modern jurisprudence, presupposes the Lockean idea of the person as individual. Accordingly, your liability for punishment is limited to what you as an individual – regardless of your status – can be alleged to have done based on *prima facie* evidence surrounding the crime. These claims are then tested in a court of law for whether you did indeed commit the crime in question. The presumption is that you are innocent unless proven guilty, but even then your state of mind and other mitigating factors can affect your sentencing. As it turns out, one of Locke's most ardent 19th

century followers on this matter – John Stuart Mill – appears to have provided the first extended philosophical discussions of 'responsibility', which up to that point was a largely literary term with no precise legal meaning[5]. Mill's concern was that people be punished for what they actually did, and not simply suffer 'guilt by association', say, by virtue of having been born into a certain class which is seen as prone to criminal behaviour.

Here it is worth mentioning that Mill was concerned with more than simply the prospect of the police rounding up people who had nothing to do with a given crime because they were, say, of working class origin. He was equally worried about fellow Victorian 'do-gooders' who diagnosed segments of society as 'potentially criminal', which was used as a pretext to meddle in their freedom through various medical and psychiatric procedures. Nevertheless, at the time these do-gooders were widely seen as offering a more 'humanitarian' alternative to capital punishment or indefinite imprisonment. Of course, *Minority Report*-style anticipatory uses of big data in crime prevention are gradually returning us to this Victorian turn of mind against which Mill railed. In both the historic and the futuristic cases, issues of personal responsibility are less salient because, in the implied utilitarian calculus of the do-gooder, the value of stopping a class of people from possibly doing wrong outweighs the value of catching particular individuals who actually do wrong.

The logic of the utilitarian argument is relatively easy to see once we concede that an individual can be identified in multiple ways, each of which carries its own form of responsibility. Contrary to Locke and Mill, 'I' am not simply – or even primarily -- a specific sentient being with a unique personal history which is routinely registered, however imperfectly, in memory and consciousness. I am also a member of various set-theoretic classes of individuals: I belong to the category of male,

[5] McKeon, 1957.

White, US-born, UK-based, academic, etc. people. A statistical analysis of the correlations of the behaviours of people in these various categories might end up revealing me to be prone to certain offences. In that case, I am held 'responsible' for those offences even if I personally never commit one. This sense of 'group responsibility' can be extended still wider to include all citizens of a nation-state or all members of tribe. Indeed, Richard McKeon observed that the first generation of philosophical criticism of Mill's position came from the British Hegelian F.H. Bradley and the French philosophical anthropologist Lucien Lévy-Bruhl, who held that collective identity overrode individual identity in the ascription of responsibility[6].

The logical extension of this position is to demand, say, complete nuclear disarmament, following humanity's demonstrated capacity to use nuclear weapons. The idea of universal human complicity in nuclear war, popularized by Jean-Paul Sartre after Hiroshima, involved several strands of reasoning, most notably that both the US and Nazi Germany were trying to develop such weapons (so it is only a contingent fact that the US did it first) and that other nations either supported or remained neutral to these developments. This then provided prima facie grounds for humanity's collective responsibility for Hiroshima and the moral imperative that makes everyone responsible for ensuring that it never happens again. Interestingly, a still more cross-nationally and historically grounded version of the same story might have been told about humanity's collective responsibility for the atrocities caused by eugenics, which reached their peak in the Nazi concentration camps, but had been a staple of progressive social policy thinking in the early twentieth century[7]. Yet, that narrative never really took off. Instead, particular individuals were held accountable for specific 'crimes against humanity', and genetics

[6] McKeon, 1957.
[7] Bashford and Levine, 2010.

research itself soon entered a new revolutionary phase with the advent of molecular biology, which has revisited -- in more nuanced terms, to be sure -- the original eugenics agenda, increasingly under the rubric of 'transhumanism'[8].

This is not the place to delve deeply into why such a negative sense of collective responsibility has continued to haunt the history of nuclear energy research, but much less so in the case of genetics. One possible explanation is relevant to the idea of morphological freedom – namely, that we have long embraced a *positive* sense of collective responsibility with regard to our genes, which is after all what gave eugenics its progressive image until the rise of Hitler. Once Bismarck invented the German welfare state as an *insurance* system in 1890, he effectively shifted the ontology of state administration from actual individuals to possible individuals. The former are governed by the sum of observed behaviours on a day-to-day basis, the latter by statistical regularities that obtain between salient properties in those behaviours as observed over many generations. '65' as the retirement age exemplifies this shift in mentality, calculated as it was to justify a redistribution of wealth from rich to poor, so as to allow everyone to lead their anticipated few final post-working years in decency. But of course, particular individuals may die before or after age 65, but that age was chosen because deviations from the norm could be accommodated within a tolerable tax regime. That this had been the strategy all along became obvious in the 1970s with what James O'Connor originally dubbed the 'fiscal crisis of the state', which rumbles on to this day in the guise of neo-liberalism. The designers of the welfare state had failed to consider that its arrangements might promote successive generations of people whose increased life expectancy is not matched by increased taxability (which is not the same as increased productivity).

[8] Fuller and Lipinska, 2014: chap. 3.

My point here is not to debate the fine points of the welfare state's administration, but to observe that its fiscal crisis was brought on by conceptualising the nation-state as a proper population – as opposed to a simple aggregate of individuals who happen to be collocated in a region of space-time. While populations are of course composed of individuals, these individuals are presumed to be governed by the properties that they share with others, which can be in turn correlated in various ways for policy purposes; hence, the great boost to systematic quantitative social science given by the welfare state from its inception. Moreover, individuals inhabiting the welfare state are seen as variable with regard to these properties over their lifetimes and, in the case of class mobility, perhaps even encouraged to change their properties. By configuring people in this way, the welfare state effectively fosters a *pooled* sense of collective identity. Put bluntly, it's not that everyone identifies equally with the whole, but rather that everyone equally identifies with any part of the whole – as, say, the healthy may become sick the rich may become poor, and vice versa, of course. This intuition was famously captured by John Rawls' 'veil of ignorance' as the basis for deciding the principles of the just society[9]: You want a society that is just for all its members even if they don't know their own specific place in it. But of course, one may accept the veil of ignorance without necessarily agreeing with Rawls on the exact principles of justice which follow[10].

Let us take stock. Notwithstanding transhumanism's libertarian rhetoric, the sensibility that informs the value placed on morphological freedom is aligned less with the Lockean sense of individual responsibility than with a more Hegelian sense of collective responsibility. Thus, transhumanists place much greater emphasis on extending human capacities along specific dimensions (e.g. greater longevity, memory storage,

[9] Rawls, 1972.
[10] Hare, 1973.

computational power, motor skills) than on defining the grounds for saying that such an enhanced individual is 'the same' as its unenhanced predecessor. In this respect, morphological freedom is more about your being who you want to be (now) than with your being yourself (over time). Moreover, as we have just seen, morphological freedom's implied sense of pooled identity fits the ontology of the welfare state. This may help to explain why more politically oriented transhumanists such as Zoltan Istvan have campaigned for a 'universal basic income', a rather anti-libertarian idea which nevertheless can be understood as a state-underwritten 'ground of being', a guaranteed capital base for the pursuit of morphological freedom. Such a policy would be especially attractive to those who might wish to experiment with alternative modes of being without having to be permanently associated with any of them if they don't turn out as desired – a bit like how bankruptcy law or debt forgiveness works.

Put in the brutal terms that Marx would have recognized, transhumanism's principle of morphological freedom amounts to the desire for humans to exist as capital already does. Putting the matter this brutally may help to address a public policy problem that looms on transhumanism's horizon. Morphological freedom would allow people to exist in radically diverse forms, many of which would have resulted from experimentation or even self-experimentation – and not all of which would have gone to plan (i.e. some of the subjects might regard themselves or be regarded by others as 'disabled'). Moreover, the openness of transhumanism to xenotransplantation and cyborganization, as well as transhumanism's presumed continued tolerance of unenhanced humans, raises the question of what would count as a just distribution of resources in a transhumanist society. After all, as originally noted when discussing Locke, the social contract had been predicated on the rough natural equality of individuals, which in effect rendered them equally co-dependent.

In contrast, to take an extreme transhumanist prospect, the resource requirements of a million living humans are much less than those of a million computers simulating a million humans – say, those who have had their brain contents uploaded before suffering a biological death. Brains are simply much more energy efficient than computers if taken on a one-to-one basis[11]. But of course, a single computer operating with a sufficiently sophisticated programme could simulate many dead humans at a diminishing marginal cost, given the massive similarity in the structure, function and inputs of human brains. As a result, some large number -- say, a thousand -- humans simulated in one computer may end up being cost-competitive with one living human. These thousand simulated humans would be effectively sharing the same body. Indeed, over time problems of individuation may arise as the simulated humans interact with each other and thereby acquire their own versions of each other's memories, perhaps resulting in an emergent hive intelligence, something akin to the 'Borg' in *Star Trek*. In short, a just and efficient society founded on the principle of morphological freedom may have as an unintended consequence a rather variable commitment to the very idea of individuation, the ontological ground of libertarianism. In that case, some people may simply opt for a shared identity of some sort.

Finally, all of this raises interesting problems relating to political representation in a morphologically free society: Who speaks for the Borg – and perhaps even how does it speak? Here I am tempted to take seriously the music industry distinction between *downloading* and *streaming*: In the future, humans may be seen as existing in one of two forms: either downloaded into enhanced biological bodies or streamed from advanced computers. On the one hand, as advances in genomics make 'genetic information' increasingly literal, birth may come to be seen as the 'download moment'. On the other hand, 'human streaming' may take the form of holographic projections drawn

[11] Nagarajan and Stevens, 2008.

from a computer's library of programmes and memory bases, whenever and wherever. In the UK official popular music charts, 100 streams = 1 download in terms of representing the relative standing of particular songs. Translated into the context of a transhumanist polity, it would mean that the price of maximum morphological freedom (i.e. existing as a stream) is the need for collectivization in order for their interests to be heard in matters relating to the well-being of the society that houses both them and the traditionally embodied (i.e. existing as a download) humans. To be sure, this political resolution covers only a very simple and extreme transhumanist polity.

If morphological freedom were to take full hold of our political imagination, then we would need to bring not only cyborg humans but also 'uplifted' animals into the discussion. 'Uplifting', a term coined by the US science fiction writer David Brin in the 1980s for an extension of the idea of 'animal rights' from simply protecting otherwise endangered species to outright empowering them so that they can deal with humans as 'equals' in how humans normally understand the term, which includes engaging in political and economic relations[12]. Fuller sketches the terms on which such a polity might be formed[13]. Many of the resource requirement issues highlighted above would now be multiplied for such differently constituted beings, each entitled to realize their full potential without interfering with the ability of others to do likewise. Questions surrounding the production, distribution and consumption of energy in a sustainable ecology would be raised to a whole new level. One consequence may be that part of 'living efficiently' comes to mean is dying plus the opportunity to be resurrected in some other medium.

[12] See also Donaldson and Kymlicka, 2010.
[13] Fuller, 2015.

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Appendix: Transhumanist Bill of Rights

Presented to the United States Capitol on December 14, 2015 by Zoltan Istvan, founder and US Presidential candidate of the Transhumanist Party

Preamble: Whereas science and technology are now radically changing human beings and may also create future forms of advanced sapient and sentient life, transhumanists establish this TRANSHUMANIST BILL OF RIGHTS to help guide and enact sensible policies in the pursuit of life, liberty, security of person, and happiness.

Article 1. Human beings, sentient artificial intelligences, cyborgs, and other advanced sapient life forms are entitled to universal rights of ending involuntary suffering, making personhood improvements, and achieving an indefinite lifespan via science and technology.

Article 2. Under penalty of law, no cultural, ethnic, or religious perspectives influencing government policy can impede life extension science, the health of the public, or the possible maximum amount of life hours citizens possess.

Article 3. Human beings, sentient artificial intelligences, cyborgs, and other advanced sapient life forms agree to

uphold morphological freedom—the right to do with one's physical attributes or intelligence (dead, alive, conscious, or unconscious) whatever one wants so long as it doesn't hurt anyone else.

Article 4. Human beings, sentient artificial intelligences, cyborgs, and other advanced sapient life forms will take every reasonable precaution to prevent existential risk, including those of rogue artificial intelligence, asteroids, plagues, weapons of mass destruction, bioterrorism, war, and global warming, among others.

Article 5. All nations and their governments will take all reasonable measures to embrace and fund space travel, not only for the spirit of adventure and to gain knowledge by exploring the universe, but as an ultimate safeguard to its citizens and transhumanity should planet Earth become uninhabitable or be destroyed.

Article 6. Involuntary aging shall be classified as a disease. All nations and their governments will actively seek to dramatically extend the lives and improve the health of its citizens by offering them scientific and medical technologies to overcome involuntary aging.

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Im/possible desires: media temporalities and (post)human technology relationships

Jörgen Skågeby

The general question of how our human desires can be supported by media technologies has produced a fairly constant endeavour in human history — and still does, for example in the shape of transhumanist hopes and aspirations. Over time, these desires have often driven development towards an, in the end, materialized technology. Many times, however, the desires have also not resulted in a physical product, but rather remained as ideas, conceptual sketches, or lo-fi prototypes. This essay will examine how such *imaginary media technologies* can be defined and categorized, why they are important to study, and how the underlying desires seem to be revitalized across centuries and decades. Such questions are of interest to transhumanism as they illustrate how desires, temporal relations, and human-technology relationships have been (and are) imagined both in the past, the present, and towards the future[1]. So, while this essay is not a media archaeological excavation of transhumanist imaginary media only (which would be an interesting project in itself), it is a media genealogy of historically recurring desires to extend, substitute and enhance the human body and mind.

This essay will make use of two typologies to explore desires and temporal relations in relation to media technologies. Firstly,

[1] Gardner and Wray, 2013.

Verbeek's expanded version of Ihde's famous typology of human-technology relations[2]. Secondly, Kluitenberg's variantology of imaginary media[3]. As mentioned, these two typologies will be used to explore a range of im/possible desires in relation to human-technology relationships. Embedded in such desires are, as we shall see, also a range of temporal interrelationships making this essay bridge academic areas such as media archaeology and transhumanist futures.

A typology of (post)human-technology relationships

Verbeek presents an extension of Ihde's classical model of human-technology relationships, which emphasises it as a:

> "posthumanist" account of human intentionality because it shows the manifold ways in which intentionality is not "authentic" and "direct" but has a mediated character.[4]

Ihde's original model[5] distinguishes between four different types of human-technology relations: embodied, hermeneutic, alterity, and background relations. By embodied relations Ihde refers to technologies that are used to perceive or act upon the (more or less) immediate environment. These technologies practically become phenomenological extended parts of the user's body, such as a pair of glasses, a bicycle, or a kitchen knife. Hermeneutic human-technology relations consist of such interactions where we, as users, can make an interpretation of the world through a mediated representation of it. Old media technologies, such as the radio or the TV could provide good examples – although they continuously aim for more immediacy[6], they are always only substitutes for the first-hand experience. Other classical examples are the thermometer or the compass. Alterity relations refer to relations where technologies can

[2] Verbeek, 2011.
[3] Kluitenberg, 2011.
[4] Verbeek, 2011, p. 142.
[5] Ihde, 1990.
[6] Bolter and Grusin, 2000.

masquerade or act as an "other". For example, the way people assign intentions; emotions; or cognition to various machines reveal a basic desire to project human characteristics to things that act in a similar (enough) fashion (as empirically proven by the media equation[7]). The underlying reason for this is most likely the combination of interactivity and (growing) autonomy of technologies (what Kitchin and Dodge refer to as secondary agency[8]) making it easier to assign agency and intentionality to machines. Background relations are more abstract and form a kind of backdrop to other experiences. Such technological relations are not immediately experienced or acted upon. As Verbeek puts it: "They are present and absent at the same time: without us noticing them, they give form to our experience by shaping a context for it"[9]. As such, these technologies provide a circumstantial setting by shaping (and sometimes controlling) for example room temperatures, air conditioning, or background noise.

Based in his orientation towards a "posthumanist, or even transhumanist, account of intentionality"[10], Verbeek adds two additional types to these four basic human-technology relations: cyborg relations and composite relations. Arguably, these can also be seen as expansions of Ihde's embodiment and hermeneutic relations. The cyborg relation is (as expected) grounded in the notion of a completely merged entity, and described as a radical variant of the embodiment relation. Verbeek argues that there is a significant difference between, for example, wearing eyeglasses and having a vision-improving chip implanted in your body. The relation moves from being distinguishable (the glasses) to being indistinguishable (the chip). In terms of the phenomenological experience, a (merged, amalgamated, indistinguishable) cyborg relation is incorporated and intimately mediated rather than an externalized relation of something being "used" as a tool.

[7] Reeves and Nass, 1996.
[8] Kitchin and Dodge, 2011.
[9] Verbeek, 2001, p. 132.
[10] Verbeek, 2011, p. 143.

Composite relations, then, can be regarded as an expansion of Ihde's hermeneutic relations. This type of relation is characterized not merely by a representation of an external reality, but by an active co-construction of it. This could, for example, include aspects of reality which are not originally discernible to the human sensorium (such as an ultrasound machine or a radio telescope), but also technologies which superimpose information "on top" of the human senses (such as VR or AR systems) effectively constructing (new aspects of) reality. According to Verbeek, composite relations appear when technological intentionality is added to human intentionality. That is, the experience (or phenomenology) of the machine and the human experience come together to form a joint view of the world. Naturally, this joint view is the result of an interesting *negotiation between intentionalities*, which can become a fruitful focal point for analysis.

This paper will go on to argue that imagined human-technology relations (and thereby imaginary media technologies) are, and have been, of utmost importance to the transhumanist imagination. The overarching ambition and desire to surpass our cognitive and biological limitations has of course resulted in many fictitious accounts of (more or less) transhumanist imaginary media. Before demonstrating a range of such examples however, a definition and typology of imaginary media needs to be explicated.

A definition of imaginary media

In his development of a variantology of imaginary media, Kluitenberg draws on Zielinski's fundamental definition, which states that they can be seen as expressions of im/possible human desires as un/realized over time[11]. Elaborating on that definition he initially distinguishes three major types of imaginary media.

[11] Zielinski, 2006a.

Firstly, conceptual media. These are media technologies that never made it past the drawing board. Media that have, so far at least, remained as ideas or conceptual blueprints for technologies that have not yet been realized. As Zielinski himself puts it "artefacts that were only ever sketched as models or drafted as concrete ideas on paper, but never actually built." [12] An interesting consequence of this definition is that we could say that many *patents* are in fact, conceptual media – concrete ideas on paper that have not yet been built, but which also functions as attempts to territorialize the potential future as one's own.

Secondly, *untimely* media, which is basically media that is out of sync with its time. Perhaps they were designed and built, but they never became popular, or were hidden away, or were effectively out-dated by the moment they were released on the market, marginalizing them as "dead-at-birth media". Again, as Zielinski puts it: "media devised and designed either much too late or much too early, realised in media practice either centuries before or centuries after being invented"[13].

Third and finally then, Zielinski also mentions *impossible* media. These are machines or technologies that are, more or less, pure fantasies – that appear as so fantastic or so spectacular that, under current scientific regimes, they are practically unachievable. Today, things like proper time machines, magic wands, or (possibly) around-the-world teleporters could be seen as impossible media. These are as Zielinski says: "imaginary media in the true sense… where the initial design or sketch makes clear that they cannot actually be built, but which implied meanings nonetheless have an impact on the factual world of media."

Parikka expresses his definition of imaginary media slightly differently, but it still provides a very striking phrasing. He identifies imaginary media as "something you do not always find in basic media studies textbooks: media that are the stuff of

[12] Zielinski, 2006a, p. 31.
[13] Zielinski, 2006a, p. 31.

dreams and nightmares, at times existing only in the minds of inventors or science-fiction writers"[14].

As such, imaginary media has an interesting position between the realized and the complete fantasy, and between the past and the future. In all of Zielinski's three types of imaginary media – and in Parikka's definition – there is a temporal relation between that which only exists as ideas and that which has been produced in material form. That is to say that even impossible media *could* stand a chance of being realized at some time in the future, maybe a thousand years from now – just like media technologies that were seen as completely impossible a thousand years ago are realized today. For example, if we were to describe a simple telephone call to a person living a thousand years ago, it would probably have been seen as crazy, perhaps even as dangerous, and you would maybe even find yourself being sentenced to death for being a heretic.

Nevertheless, the interesting thing is how these forms of media – the imagined and the realized – are continuously co-informing each other. This is to say that both the discursive *and* the material are important aspects of the analysis. How we *represent* imagined media technologies is important to the actual desires, expectations, fears, and hopes that we assign to the material technologies that we face in our lives right now (or soon-to-be now). In the same way, the material technologies that we are familiar with and use probably have a strong impact on the types and forms of media that we tend to imagine. Taken together, this results in a permeable border between the imagined and the realized, and between the past and the future, making them continuously influence one another.

This permeable border is also one of the main reasons why imaginary media become important to study. Imagined media technologies are more than just plot devices, their function is not just to drive a particular narrative or a particular story — they do that too — but they also have many other functions in our

[14] Parikka, 2012, p. 44.

society – as expressions of desires, fears, myths, hopes and so on — and as conceptual blueprints for our imagination when designing or using actual technologies in our everyday lives.

Also, media technologies *in themselves* have historically developed as ways to challenge the border between what is real and what is simulated, between what is a true experience and what is just an illusion. So, many media theorists would argue that the way media develops is by aiming to transfer experiences in more real ways than before (most prominently Bolter and Grusin). Each new technology has the ambition to convey a more real experience than the previous ones (and thus more effectively entice certain desires).

This is something we still see today, in commercials and advertisements where a more real experience is something that is emphasized as the most important aspect of a new technology – be it a curved high-definition TV, a virtual reality headset, or a breaking story in an online newspaper. They all want to come closer to the "real" story, or the real you, or the real experience. As Bolter and Grusin noted, the way they do this is by adding *more* media – and subsequently marketing this to consumers. So, there are several interesting areas where the imagined and the real overlap and create new and exciting tensions, that are good places to look for the cultural expectations, myths, desires, fears and hopes that we have around new media technologies.

A variantology of imaginary media

From Zielinski's basic definition, Kluitenberg develops a more detailed typology, or a *variantology* as he calls it, of different kinds of imaginary media. He proposes eight different types. The very purpose of calling it a variantology is, to emphasise that this is not a *complete* list of all possible types of imaginary media. Rather, there would seem to be room for many more interesting ones that could easily be added to the variantology. As such, this essay will propose two new additions to this variantology of imaginary media: invasive media and media for transcendence.

Next, this essay will go through these imaginary media categories and present examples, both as historical cases but also as instances of how the underlying desires live on in more contemporary culture, showing that they are, many times, *persistent* and *recurring* ideas in terms of how we imagine future media and our (post)human-technology relations to them.

Imaginary media for communicating with the divine

These imaginary media technologies are simply media technologies that were devised as a communication channel to a divine being – a higher metaphysical plane – often driven by a religious motif to make it easier (in some way) to get in direct contact with God.

As an historical example Kluitenberg presents Heinrich Suso's Wisdom's Watch. Heinrich Suso was a catholic mystic who lived in the fourteenth century. At the time when Suso imagined this machine, mechanical clocks had just begun to make their way in to western societies. Starting in monasteries as a way to keep regular track of times for prayer, the mechanical clock in civil society became more of a way to structure and order life in general. As such, it doesn't seem that far-fetched to believe that Suso was very inspired by the impact of the real mechanical clock when he devised this media technology for communicating with the divine. In fact, the mechanical clock probably impacted a great deal on how the world was thought of in general. The passing of day into night and the movements of the stars were to Suso *visible* signs that life and metaphysics were organized around a kind of invisible clockwork, which was in turn ruled by some sort of divine intervention.

Thus, what Suso suggested was a clock that co-ordinated this divine clockwork with the mechanical clock so that humans could bring their lives into unison with this divine order. In Suso's imagined clock the hands were controlled by a divine being and suggested that if you made sure you were praying at

the right time, you could establish a channel of communication to this divine being. As mentioned, in the construction of his imaginary medium Suso portrays the world as a clockwork and as one giant communication medium set in motion and guided by the invisible hand of eternal wisdom, which thus "communicates" divine order to the human subject. In Suso's mystical vision, which became very popular throughout Europe in 14th century, the clock is a connection machine, a medium to co-ordinate not only the affairs between humans, but also between the human and the divine. This is, admittedly, a very old example (and may seem a bit remote to us) but the fact is that this idea of using media to communicate with the divine is still present in various ways in contemporary society.

In many examples of televised televangelism, viewers are instructed to "touch the screen" and thereby create a chain of communication via the TV and the televangelist to a divine being and receive a blessing of some kind (see for example "Powerful Prayer with T.B. Joshua"[15]). From a media theoretical perspective this is interesting since it calls to viewers not only to confront issues of faith, but at the same time also confront their beliefs in how a specific technological infrastructure works and what role that infrastructure can play in conveying (divine) messages and communicating with the public at large. If you make a comparison to Suso's divine clock, televangelism can be seen as a way to make use of contemporary media technologies to find a way to fulfil the same desire — to communicate with God.

Another more recent example, which caused a bit of controversy relates to the phenomenon of "speaking in tongues". This is basically when a person is in a state of religious inspiration and is thereby also capable of receiving divine messages and speaking a divine language. This language is often incomprehensible to the person who is speaking and to most listeners as well. News stories tell us of a televangelist who was not speaking in tongues, but *typing* in tongues in a Facebook status update[16]. A person

[15] Joshua, 2010.
[16] Menzie, 2011.

was receiving a divine message, which she then typed on her keyboard in a Facebook update. Several more such posts with strange spellings continued to appear and visitors to this particular Facebook page began to question this idea. While there were people agreeing that this was true divine communication, others were more sceptical and claimed that it was not even possible to be typing in tongues. Regardless of whether you think it is possible or not, it is interesting to see how the medium of communication plays a role here. The question of whether this is possible is not *only* a question of belief, but also a question of what you think a medium is capable of recording or communicating.

This tension (if you will) is also apparent in many other modern genres of communication. For example, another event tells us of a Virgin Mary apparition that was found in a piece of virtual wood in Second Life[17] (the person who found it later went on to try to sell it, perhaps also telling in some way). Yet another example can be found on the Catholic website Savior.org. The website broadcasts a live webcam image of an altar bread (one of the Blessed Sacraments). The purpose being that, in many Catholic churches, believers can come and sit in the presence of the Blessed Sacrament at any time of day, not just during the actual Mass service. Via Savior.org you can also do that online, via webcam. The "curious" thing is that the webcam image never actually changes, because the bread is, after all, probably not going to move. But there is still this idea that it needs to be represented through an updated webcam feed, to deliver an experience of "liveness". Arguably, this acts as a substitute for physical co-presence, even though the viewer could probably not tell the difference if it was just a static image, which also says something about what we think that media does and how it works.

These latter examples may not present imaginary media in the sense that they are conceptual, untimely, or impossible as such. However, what I want to show is how the particular desire to

[17] Krotoski, 2006.

communicate with the divine may also be expressed through existing media (in imagining what they are capable of), creating yet another interesting temporal relation between desires and media technologies.

Imaginary media for communicating with the dead

Another recurring desire when it comes to imaginary media has been to improve our abilities to communicate with the dead. For example bringing back spirits (or listening to them), or to create some sort of audiovisual proof that spirits do, in fact, exist (beyond ordinary human perception). Thus, it seems important to recognize that how the dead or the spiritual world is invoked in a specific culture and time, depends partly on which media technologies that are available. So, historically, there have been many ways to establish communication with the dead ranging from campfire legends to the Internet. And each of these technologies have their own affordances, their own functionalities and uses, that make certain types of communication easier than others – from the re-telling of stories across generations, to grave stones and monuments, to photographic and phonographic memories and reconstructions, to using the internet for grieving, mourning and establishing family bonds that have been lost or deteriorated over time.

Kluitenberg begins his exposé of imaginary media for communicating with the dead by referring to Edison who imagined machines with the specific intention of establishing a channel of communication to the dead. His ideas of a Ghost Machine or a Spirit Telephone were imaginary media intended to record or make contact with ghosts or spirits of deceased people. As Edison put it: "I am inclined to believe that our personality hereafter will be able to affect matter. If we can evolve an instrument so delicate as to be affected by our personality as it survives in the next life, such an instrument, ought to record something" [18]. These machines clearly actualize composite

[18] Noory and Guiley, 2011, p. 91.

relations, where our sensorium is extended through technology, helping us perceive new layers of (imagined) reality.

There is (to the author's knowledge), however, no proof that Edison actually constructed one of these machines, but his idea of what is now commonly referred to as Electronic Voice Phenomenon, or EVP, became popular in the 1970s again. Electronic Voice Phenomena are simply sounds that are found on electronic recordings, which can then be interpreted as the voices of spirits. Those who are enthusiastic about EVP claim that hearing words in EVP is a special ability that you have to develop and train in order to become sensitive to it. Sceptics, on the other hand, suggest that EVP is mostly misinterpretations of natural phenomena, or attempts to steer (or even manipulate) the representations in desired directions. Perhaps unsurprisingly there is not very much scientific research on EVP, meaning that most research in this field is carried out by "amateur" researchers who independently develop media technologies to support this practice[19]. One example of this would be the Mel-meter, which is a device designed by an electrical engineer who tragically lost his daughter in a car-crash[20]. He has invented a range of electro-magnetic sensors, which has found a niche market and the devices, which are priced between $79 and $350, have become quite marketable (see for example www.ghostoutlet.com or www.ukghoststore.com).

These desires (to make sure that dead loved ones are OK or to reassure us of a spiritual afterlife) are also visible in the growing broadcast and popularity of "spiritual" TV shows, such as Ghost Adventures[21] or Ghost Hunters[22], as well as in more fictional shows such as Serial Experiments Lain[23] and Caprica[24] (where digital human clones can survive by being "carried on" networks

[19] Noory and Guiley, 2011.
[20] Fallon, 2010.
[21] Belanger, 2008.
[22] Monahan, 2004.
[23] Konaka, 1998.
[24] Aubuchon, 2009.

or even on robotic bodies). Taken together, these examples indicate a cultural resurrection or reproduction of a popular genre of communication (and its imaginary media technologies).

Imaginary media for communicating with the other

The next category is referred to as imaginary media for communicating with the other. Under this heading, Kluitenberg explores two themes of 'the other'. The first has to do with (the dream of) global and equal communication. And Kluitenberg does not go very far back in his example of this, but refers to how the Internet was championed as a truly democratizing technology that would overcome social and national differences and allow for everyone to take part in society on equal terms. One concrete example of such utopianism was the "Declaration of Independence of Cyberspace" written in 1996 by John Perry Barlow:

> We are creating a world that all may enter without privilege or prejudice accorded by race, economic power, military force, or station of birth. We are creating a world where anyone, anywhere may express his or her beliefs, no matter how singular, without fear of being coerced into silence or conformity[25]

While this excerpt is to a certain extent true, it is also clear that the Internet suffers from lots of difficulties in making this vision of equality come true in full. Instead we seem to have lots of commercially controlled islands of communication such as Facebook (very popular in the US and western Europe), VKontakte (a popular social network among Russian speaking users), and Renren (a popular social network among Chinese speaking users), which are aimed at different groups and nationalities of users. Apart from the Internet, similar utopian hopes can be found in many other technological developments in history (including for example trains, planes and automobiles; steam power, or electricity).

[25] Perry Barlow, 1996.

An example of an imaginary media technology of this type (i.e. to bridge various barriers and create social cohesion and understanding) would be the Babelfish, which is an animal, but that works as a medium once you put it in your ear. That is, the Babelfish from the book The hitchhiker's guide to the galaxy[26] functions as a brainwave decoder, making it possible for all the various races occupying the Hitchhiker universe to understand each other even though they use different verbal languages. While being a plot device to overcome questions of communication barriers, it is also an expression of a longing for a more fundamental form of communication, which also functions immediately (in the sense of Bolter and Grusin). It can be seen as a transhuman technology precisely because it functions to overcome communication obstructions. However, it does not do this by enhancing our capabilities, rather it taps into unused cognitive resources (brainwaves) and mediates these through a brain-animal interface.

The second version of imaginary media for communicating with the other is, as Kluitenberg says, a more "shady" side, having more to do with sexual desires, sexual differences and man-machine relations. Here, he calls upon the concept of 'bachelor machines', which has been used in different ways by for example Marcel Duchamp [27], Michel Carrogue [28] and Deleuze & Guattari [29], but which for Kluitenberg refers to imaginary technologies that express a, often heteronormative and patriarchal, desire to mediate a certain kind of sexual longing. As an example, when electricity was discovered and various scientists were beginning to understand how it could be controlled, a range of devices *exposing* people to actual electric shocks became popular. The so-called electrical kissing machine, or Venus Electrificata, from the early 18th century, was a machine where a person (a woman most likely) would stand on an

[26] Adams, 1979.
[27] Duchamp, 1969 (1932).
[28] le Bot, Brock, Carrogues, de Certau, Clair, Gorsen, Lascault, Lyotard, Metken, Montesse, Radrizzani, Schwarz, Serres and Szeemann, 1975.
[29] Deleuze and Guattari, 2000.

electrically isolated platform and get charged up with static electricity[30]. Another person — most of the times presumably a man — would then kiss her and receive a strong electrical shock in the process. It would seem that this novelty machine was something of a salon past-time by the time. Interestingly, there is also a modern incarnation of this machine developed by the Kajimoto Laboratory at the University of Electro-Communications in Tokyo[31]. This represents a kind of imaginary media (a potential machine), since it is doubtful it has become, or will become, very popular. Still, it emphasises an imaginary media desire, which also comes with a potentially shady aspect to it: to make machines that support sexual desires, but which also expresses certain views on gender and sexuality.

To continue this argument, when discussing modern bachelor machines as imaginary media, it becomes hard not to mention Samantha from the movie Her[32]. In this movie protagonist Theodore Twombly falls in love with an artificial intelligence. The movie goes on to explore borders between real and virtual in many different ways, and what social and cultural rules that are applicable to an 'othered' being. Even though the movie is a science fiction rom-com, where *anything* could be imagined, the movie is at the same time rather conforming to current heteronormative standards, and Samantha clearly qualifies as a modern imaginary bachelor machine.

The same goes for Ava in Ex Machina[33], who is an imaginary media machine, that even though it could look like anything, conforms to many of the tropes of women in film. Ava is a femme fatale; a seductress posing as a damsel in distress, who uses her seductive skills to get one man to save her from another man (whose mission is to build 'the perfect woman'). This tendency to give a female artificial intelligence the most basic and stereotypical feminine characteristics is a recurring patriarchal

[30] Heilbron, 1982.
[31] Lee, 2011.
[32] Jonze, 2013.
[33] Garland, 2015.

desire. This is a certainly movie that wants to build narrative tension, but by only showing that Ava understands heternormativity and uses it to manipulate men, she is also left as a very clichéd female character. Ava is almost like an even darker and more sinister version of Samantha in *Her*. Ava is at the same time a beautiful seductress and a cold machine that can be turned off if she doesn't live up to the expectations of the men around her. Again, an imaginary bachelor machine of our age.

Apart from human to other communication, there is also the case of others' communicating with each other, without the involvement of humans. This is the case in the movie Colossus – The Forbin Project[34], which is about an artifical intelligence (Colossus) used as a war computer. Being an American movie from the 1970s, Colossus is designed to learn about Russian military activities and strategies. The fear that is expressed in this movie, is that the Russians have developed a similar artificial intelligence and that these two AI:s start to communicate with each other and decide that they should rule the world without the involvement of humans. This is a subtype of othered communication where the others, in this case the machines we are creating, become our masters and decide to leave us behind in some way. This idea can, of course, be seen in many other science fiction movies and books.

Imaginary media for transcending space and absence

The next category that Kluitenberg refers to is simply imaginary media for transcending space and absence. By this he points to media that are used for keeping in touch with loved ones, for receiving news from around the world and for doing a bit of armchair travelling (i.e. experience the sights and sounds of the world without having to leave your home). However, the perhaps most mythical of all imaginary media for transcending space (except for possibly the time machine) is of course the teleporter, which has been, and still is, a desire, in concurrent popular

[34] Bridges, 1970.

culture. To be able to transport not only representations of your voice, and your visual appearance, but your entire body is just too intriguing to let go. However, throughout history there are, of course, also less spectacular technologies imagined as well.

For example the early 20th century French image series *En L'An 2000* (trans. In the year 2000) portrays a range of imagined future media technologies [35]. One such image depicts a videophone, where a multimedial innovation brings both sound and vision to a long-distance call. In hindsight, however, the image also represents a Western colonial fantasy as the person being called (represented as being in a distant place) has an Asian-looking manservant bring him tea. In a way, this imaginary media shows a future technology to transfer high definition video and sound, but at the same time the representation also fail to imagine an invention that could make a person tea by his (or her) desk.

Historically, the handshake has been seen as having a particular status as a communicative gesture[36]. That is, the handshake could convey much information about, for example, a person's status (both social and medical) or ambitions.
As such, a French imagined remote presence machine from 1905 had the ambition to mediate every expression on the face of the person you are talking with, to hear his or her voice and to feel the pressure of the handshake, even when separated by hundreds of miles. Particularly, it was imagined as a way for physicians to conduct remote diagnosing – if you could see the patient's face, hear their voice and feel their handshake you could more safely diagnose the symptoms and prescribe the correct cure for a patient in another city. The Popular Mechanics article describing this imaginary media also states that "And yet it is only a generation or so ago that the telephone, the wireless telegraph, airships, submarine boats, and even the telegraph (sic), seemed every bit as impossible and unreal"[37]. A modern version of this

[35] Côté, 2016.
[36] Schiffrin, 1974.
[37] Unknown, 1905, p. 724.

machine is the Frebble (www.myfrebble.com). As their website states: "Frebble is an accessory designed to allow you to hold hands with someone at a distance: when you squeeze it, the other person feels your squeeze. The shape holds you; you hold the shape". While nothing extraordinary in itself, the (imagined) technology shows how this particular desire for 'touching from a distance' is a recurring cultural phenomenon.

Imaginary media for transcending time

Technologies for transcending time are certainly one of the most prolific types of imaginary media. The desire to travel in time, to undo or redo things in the past, or to see what is going to happen to oneself or to society at large in the future, seems to be very strong. This is also reflected in the wide range of imaginary media that has been devised to accomplish this. The time-turner from the Harry Potter universe, the TARDIS from Doctor Who and the Delorean car from Back to the Future are all examples of such imaginary media technologies. Older technologies such as crystal balls or astrological/-nomical charts were also imagined as media that could take us beyond the limitations of time.

In relation to imaginary media for transcending time, Kluitenberg also talks about the Long Now Clock, which is a mechanical clock that is intended to run for 10,000 years. The ambition with this clock was, amongst others, that the clock should tick once a year, the century hand of the clock should advance once every 100 years, and the "cuckoo" should come out every millennium. While the clock is not fully realized yet, it is being built right now in Texas, USA. In a film on their website, the project provides an update on how the work is progressing[38]. In this film the word "imagined" is mentioned many times and with many different meanings – particularly in relation to the tension between optimistic and pessimistic views of the future.

[38] The Long Now Foundation, 2016.

Potential media

Potential media refers to media that was planned for production, but that was, for some reason, abandoned (perhaps due to costs, or due to a lack in popularity – something that disrupted this potential development of this particular media technology). This is media that died, before it gained any popularity or reached consumers in any large scale. Media history is, of course, filled with such failures and media archaeology often emphasise how these mistakes, sidetracks and alternatives are still interesting examples of how the future of media was imagined, at a specific point in time. That is, by just looking at stories of how certain media technologies have become successful and popular, we may miss out on these strange turns and odd circumstances that media development could have included. Just to mention a number of such potential media, we may refer to the auto-magic picture gun, which was a kid's toy, or a media technology for children[39]. This was a hand-held, miniature photo-projector in the shape of a small pistol. It was used to project still pictures onto a screen, and could then be operated by the trigger of the gun (to advance to the next frame). This potential media never became a huge success. The Selectavision vinyl video system, is another example[40]. This technology took some 17 years of development, making it very non-market friendly when it arrived in 1981 as many other competing formats were making their ways into consumers' homes by then. The Video Home System (VHS), which offered a longer run time in a smaller package, was already well on its way to becoming the standard video technology in most homes. Also, movies stored on vinyl records had to be manually taken out and turned over halfway through the film, which was seen as a bit of a nuisance. So, the Selectavision was already outdated, in a way, by the time it arrived on the market. Nevertheless, it is an interesting example of intermediality – and perhaps, if it had been faster in development, it could have been popular?

[39] The Strong: National museum of Play, 2016.
[40] Howe, 2016.

Yet another example of potential media is the Clavilux, which was a musical instrument and at the same time a kind of psychedelic visual pattern projector[41]. Invented by Thomas Willfred, it was intended as a multimedial experience, where music and visual effects would complement each other. During a performance the musician would sit on stage with a huge screen that received the projections from the Clavilux itself. However, it was not only an instrument for large concerts, there was also a version for the home, where you could play it in your own living room, projecting the visuals onto a wall. One parallel that could be drawn to the present is how the visual effects in Itunes work and appear. The underlying idea is basically the same, to have more or less psychedelic visual effects that accompany the music. Interestingly, not only is the idea as such similar, the manifestation of these effects is also very comparable.

Imaginary media as media of abundance

This category is about how certain media can be seen as the solution for almost anything and everything. Further, they can provide endless resources for us to make use of in an ever-growing and prosperous future. Or, in a more dystopian sense, also be the certain death of us all. Imaginary media as 'media of abundance' is thus about ways that media can harness various untapped resources in society, in culture and in the material world. This, in turn, can be for good or bad, and provide either a fantastic future or impeding doom. It would seem that digital media technologies and networked media have been especially good at spurring such imaginations.

One example of this is the most recent Swedish governmental reports on the benefits of digitization. In this report it is stated that:

> Digitization and use of new technology creates radically altered conditions for the future. It is a transforming, and in many ways

[41] Kagan, 1978.

> disruptive, change in virtually all areas of society. It means we can do things in new ways, and more importantly, that we can do totally new things. Digitization changes fundamental structures for companies and the public sector, but also the foundations for trust and social cohesion in society changes. Thus, digital change transforms the most important parts of our society – growth and sustainability, welfare and democracy. Technological development has always been tied to social development. Technical progress alters societal economy, that is, how we produce the goods and services that we need and want. As such, it also changes the social institutions and structures of society.[42]

This quote effectively illustrates on the first hand a very vague idea, almost imaginary, about what digitization actually is. It is never defined, but intentionally kept as a broad and illusive concept. On the other hand it is at the same time presented as the solution for everything – it will generate more democracy, more sustainability, more growth, and more progress. Naturally, this discourse of more, and better for almost everyone, is a recurring theme in many imaginary media, especially those that certain people want us to buy in to – either ideologically or monetary.

Imaginary media for deliverance (emancipatory media)

The final category in Kluitenbergs variantology, is imaginary media for deliverance. This category includes ideas of how media can be seen as potential saviours of a certain social group, rescuing them from current oppression and as a way to produce hope for the future. Or as a way to speculate about what it would be like if the world was different. Thus, this is a more politically charged type of imaginary media, where for example Afrofuturism is a pertinent cultural stream of imaginary media[43]. Afrofuturism deals with the general relationship that African Americans have historically had with the fields of science and

[42] Digitaliseringskommissionen, 2015.
[43] Yaszek, 2006.

technology. Where in the shady past of these fields, the African-American body was treated rather violently, with black female bodies positioned as especially alien and othered. Therefore, in Afrofuturism, adopting an alien, cyborg, or robot alter ego is one way to reclaim this previously negative relationship with science and technology. This adoption can also act as an armour to protect against the limiting cultural expectations of how African-Americans "should be".

As a completely contrasting, version of emancipatory imaginary media, we may return to the French image series L'an 2000. This series consists of a number of images where various house chores are automatized. This vision of emancipation links nicely to discussions that are being held today, about the future of work and about if or when robots may start taking over more and more of our labour tasks. This has spurred questions around whether such a development will generate more freedom for us to engage in creative and artistic practices, or if we still will have to work harder and longer for society to grow and prosper. An imaginary design manifesting such questions around robot labour has been produced by Simone Giertz through her "everyday robots" [44]. For example her "Breakfast machine", which effectively questions the norms that surround robots and automation of labour. Which labour is worthy of automation? And why? What should we do with the extra time that we may get? As such, her robots become critical imaginary media that questions the norms and underpinning reasons of emancipation through automation.

Invasive media

As an addition to Kluitenberg's variantology this paper suggests imaginary media as imprisoning or, perhaps more appropriately put, invasive media. This can be seen as a counter-category to imaginary media of deliverance (or emancipation). The history of imaginary media is in fact filled with examples of how people

[44] Giertz, 2016.

would like to watch over others, to spy on them, to eavesdrop on them, or to collect information about them. Primarily as a narcissistic way to get to know what other are saying about ourselves, but also as a more general technology to keep an entire society in check.

An example brought up by Zielinski in his book Deep time of the media[45] is the Panacousticon, which was a surveillance system of public space imagined by the German scientist and Jesuit Athanius Kircher, in the 17th century. The idea was that you should be able to overhear and eavesdrop on courtyards in castles, because this was the place where the truth was being told. The design consisted of a large spiral-shaped tube (probably inspired by the spiral shaped part of the human ear, called the Cochlea) with a capacity for amplifying sounds. This large tube was built into walls of castles and then hidden from view. It would pick up the sounds from the courtyard, amplify them and transmit them up to a form of "talking head", where the master of the castle would then get the latest gossip delivered. The intention was basically to make the castle into a sphere of surveillance, where little privacy was maintained.

This desire to spy and eavesdrop has a flipside, of course, which we may call paranoid media. As an example we may look at a recent blog post[46] that tried to imagine potential technologies that governments — or private companies — could use to monitor citizens with. They suggest many different ways that we, in the future, will be watched and spied upon. Many of these are perhaps not that extreme —the technologies already exist— it's just a matter of putting them to these uses. They range from Internet of Things applications (i.e. everyday objects with Internet connectivity), to streetlights that record conversations, to surveillance drones used on a large scale. An interesting question becomes, what is paranoia when it comes to imaginary media of surveillance, and what is just healthy scepticism? One way to start building an answer to this question is by looking at these

[45] Zielinski, 2006b.
[46] Snyder, 2012.

imaginary media, how people discuss them, and what their potential impact on society could be.

Imaginary media for transcending human limitations

Finally, it seems a little strange that Kluitenberg does not include imaginary media for transcending human limitations in his variantology. This category focuses on human capacities and how cognitive, and biological limits can be transcended (through for example an extended lifespan or a transferrable consciousness). This category overlaps with some of the other categories, but still contains such an important desire, that it deserves a category of its own, particularly as the "most transhuman" of all the categories of the variantology.

In this category, as in many of the others, there are positive, optimistic versions of the human future – often referred to as transhumanist, as well as pessimistic versions that foresee social inequality, ethical dilemmas and various disasters for the human race. As such, we seem to have many examples where transhuman desires are questioned and even rejected. For example in movies such as Self/less, where human minds can be transferred between bodies or Transcendence, where uploading the human mind to another machinic vessel is the main technology. Both these imaginary media depictions are driving the narrative into a more depressing conclusion. Whether this is just a cultural sign of the times or simply an inability to form liaisons between transhumanism and major movie producers is difficult to speculate on. It would however seem that transhumanism as an ideology and Hollywood as a producer of cultural desires have not yet developed a relation where transhumanist imaginaries are represented through, what Kirby refers to as, normalcy, familiarity and necessity[47]. That is, imaginary media for transhumanist desires have, so far, rarely been represented as scientific miracles that 1) have a potential to *save* humanity; or 2) are *necessary* for the human endeavour at

[47] Kirby, 2010.

large; or 3) can be seen as *familiar, safe*, and something to *long* for.

Conclusion

In conclusion, this essay has examined how *imaginary media technologies* can be defined and categorized, why they are important to study, and how the underlying desires seem to be revitalized across centuries and decades. These desires, as expressed in the range of imaginary media and their anticipated social contexts, not only have the potential to reinvigorate cultural debates around the use, necessity and purpose of certain technologies, but can also provide food for though in terms of future media design. Moreover, imaginary media may help the analysts and designers to consider (and 'reveal') non-human and technical aspects of media technologies (e.g. electro-magnetics, supersonics, ultra- and infraradiation, quantum computing), which can otherwise remain overly ephemeral (even magical) to users[48].

This paper has given a range of examples of imaginary media that are in different ways extensions, substitutions or enhancements of the human body, thus explicating different (post)human-technology relations. Understanding such imaginary (post)human-technology relations is important since it provides food for thought in terms of hopes and fears for the future (not only of media technologies, but to human existence). Imagined media technologies articulate what Huhtamo and Parikka calls topoi [49] : recurring myths, interaction patterns and media capacities. They are also cultural expression of how we, as a species, negotiate the tensions between the artificial and the real[50] calling for a more laborious discussion of intentionalities and moralities of (actual and imagined) machinery; the emergence of new (post)human-technology relationships; and the normativity

[48] Parikka, 2012.
[49] Huhtamo and Parikka, 2011.
[50] Margolin, 1995.

perpetuated by designs that potentially stimulate, but also limit, how we think of our conceivable future[51]. As such, this essay has tried to connect historical examples to concurrent ones, in an effort to go beyond a mere "antiquarian interest"[52]. Indeed, an increased awareness of im/possible desires and how they reoccur over time could help us respond with more caution (or delight) when enticed by "new" imaginary media.

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[51] Skågeby, 2016.
[52] Huhtamo, 2011.

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What the surrogate touches: The haptic threshold of transhuman embodiment

David P. Parisi

The promise—and threat—of transhumanism arises from its proponents' enthusiastic advocacy for using technology as a means of augmenting the natural powers of the human body, with transhumanism permeated by what Max More describes as "an optimistic flavor"[1]. Many of the ethical concerns mobilized both by proponents of transhumanism and by its critics revolve around the difficulties inherent in attempting the evolve humans through technology that is frequently shot through with explicitly or implicitly political agendas, and moreover, often seems to be steered by corporate interests[2]. Media, what Marshall McLuhan famously referred to as "extensions of man," are essential participants in the transhumanist aim of bodily enhancement, providing a variety of ways to project the biological body's sensory organs and motor functions across space and time. In this article, I want to push specifically on touch's role in realizing the rationalist and functionalist aims of transhumanism, taking seriously its proponents' claims that transhumanism celebrates, rather than denies, the biological body. I am concerned with what we may think of as the use-values imagined for touch, as it increasingly comes to be treated as both an object and enabler of technological advancement. Understanding touch as a

[1] More, 2013, p. 13.
[2] For example, see Stock, 2013.

category that is always contested, always capable of being reformatted [3] and rearticulated in response to shifting socioeconomic stresses, I am less interested in identifying absolutes around touch's capacity for or hostility to technological extension than I am in getting at the process by which touch's parameters are negotiated and reimagined.

To get at this relationship, I examine the depiction of cyborgian humans in Jonathan Mostow's 2009 film *Surrogates*[4]. In the film, human social interaction occurs almost exclusively through the hypermediation of highly advanced humanoid robot avatars dubbed surrogates (or 'surries' in the slang used throughout the film). Mostow explicitly positions this vision of a society wholly transformed by the adoption of a mediation technology as the expression of a transhumanist worldview. The short documentary *A More Perfect You: The Science of Surrogates*[5] that accompanied the film's 2010 Blu-ray release featured interviews with experts and industry leaders in fields ranging robotics to prosthetics to telepresence, with each testifying to the plausibility and inevitability of the technosocial world depicted in *Surrogates*. I will therefore understand the surrogate technology Mostow posits as a type of imaginary media—"impossible machines mediating impossible desires," as Eric Kluitenberg[6] puts it—grounded in an aesthetics of the plausible. The tactile link between robot surrogate and human operator is a defining feature of new medium, crucial to bringing about the radical transformations in social and political life portrayed throughout the film. The ability to *feel* fully present in the remotely-manipulated robot body facilitates the utopian ascendency of surrogate technology, while the increasingly unbridgeable gaps between the sensory system of master and slave stage its inevitable collapse.

[3] Elo, 2012.
[4] Mostow, 2009.
[5] Wheeler, 2009.
[6] Kluitenberg, 2011, p. 67.

A Humanist Touch

Shifting notions of the human are always accompanied by redefinitions, reprioritizations, and reconstructions of the body and its senses. The senses, either individually or in fragments, have the potential to facilitate or inhibit access to a 'human' that is itself continually adapting to new circumstances. But where transhumanism embraces this ongoing technogenesis of the senses, others push back on a perceived colonization of human communication by technology (see for example, Sherry Turkle's embrace of technophobic anxiety in *Alone Together*), positioning human and technology as antagonistic formations, where a gain by one entails a loss by the other. The vulnerability of a sense modality to technological permeation, then, jeopardizes its standing as a human sense.

In a mediatic ordering of the senses that takes for granted the extension, abstraction, and computerization of vision and hearing, touch has often been framed as having naturally inbuilt bulwarks against such takeovers—what Jacques Derrida termed a "haptocentric intuitionism" that holds touch out as the ultimate and undeceivable guarantor of authenticity[7]. In its apparent capacity to evade the logic of medialization, motivated by the belief "that touching resists virtualization"[8], touch often marks the final, irreducible refuge of the human. "Stubbornly wed to the proximate," as communication theorist John Durham Peters contends, touch is the sense "most resistant to being made into a medium of recording and transmission," defying inscription and lacking remote capacity[9]. Touch thus remains grounded in a "nonreproducible" biological body that cannot be collapsed onto its signifying functions. In this positioning, Peters echoes the twentieth century humanist rehabilitation of touch, which located the re-embrace of touch as the key to restoring a dimension of human experience lost due to a range of de-humanizing social, cultural, and technological developments. The humanist

[7] Derrida, 2005, p. 300.
[8] Derrida, 2005, p. 300.
[9] Peters, 1999, p. 269.

anthropologist Ashley Montagu, for example, lamented the general lack of tactual contact among those in British, German and American cultures, offering his landmark study *Touching: The Human Significance of the Skin* as an empirically-informed call to restore this neglected dimension of human experience[10]. Media theorist Marshall McLuhan, whom Montagu corresponded frequently with, criticized Gutenberg technology for intensifying the fragmentation of the human sensorium. Seated at the heart of a unified human, touch, for McLuhan, was not a specialized mode of perception, but rather "total, synaesthetic, involving all the senses."[11] As a "technological humanist,"[12] McLuhan celebrated electronic media not for their capacity to extend and amplify the sense of touch, but rather for the capacity of these media to become like touch. In the electric age, McLuhan predicted, humans would take up residence in a technological environment that mirrored the fundamental unity of human sense experience, a unity denied by media that extended the specialized senses of seeing and hearing.

Following in this tradition, contemporary haptic interface designers, who use technology to embed touch in computer interface systems, valorize their creations as the means to make whole a fragmented sensory experience of interacting both with computers and with the other subjects who operate them. The technoscientific synthesis of tactility, then, is unproblematically framed as a technique capable of reversing the gradual loss of the human—haptic interface technology allows us to "de-evolve," as one interface designer puts it, into a more basic mode of interacting with virtual objects.[13] Responding to a visualist paradigm in the design of virtual environments, these engineers write touch into a space that had previously excluded it[14], and in doing so, purportedly humanize the experience of visual-virtual

[10] Montagu, 1971, pp. 283-286.
[11] McLuhan, 1994, p. 334.
[12] See Kroker, 1995.
[13] Gruber,1998.
[14] For a critique of VR's visualism, see Ken Hillis's *Digital Sensations* (Minneapolis: University of Minnesota Press, 1999), xx-xxiii.

worlds, opposing the technologized senses of seeing and hearing with a touch that is inherently countermediatic.

Surrogates as (Imaginary) Haptic Media

Given the increased significance touch has come to occupy in our interactions with media, this notion that touch cannot be captured, stored, and transmitted seems to be outmoded, with the deployment of virtual touch technologies in a range of sites, including mobile communication, surgical applications, the new generation of virtual reality interfaces, networked cybersex devices, videogaming, automobiles, and prosthetics. Projections of significant growth in the market for the various technical components that provide touch feedback—an admittedly crude indicator—portray a future where haptics applications are both ubiquitous and robust [15]. Accordingly, I have suggested elsewhere[16] that we should operationalize a specific category of haptic media that approaches touch's mediatization from an empirical and genealogical perspective, pushing toward an understanding of haptic media as historically contingent objects. The designation 'haptic media,' then, offers a strategy for confronting the myriad attempts at writing touch into media technologies, showing how such efforts involve both the renegotiation of touch's cultural status, driven in part by the advertisements that attempt to create demand for these new machines, and an ongoing reformatting of touch's constitutive technical features, executed in the research labs of engineers, psychologists, and neuroscientists. Haptic media should not be seen as an ontologizing categorization, but instead as a way of orienting attention to what has frequently been a neglected aspect of media histories.

The machines used for bodily extension and amplification in *Surrogates* are certainly, from the standpoint of the senses, mixed media—that is, they extended multiple sense modalities across

[15] see for example Vicari, Melnick, and Holman, 2013.
[16] Parisi and Archer, forthcoming.

space, allowing their users to feel fully present in remote environments by seamlessly braiding together data from the range of bodily senses. But understanding surrogate technology as a type of haptic media allows us to hone in on the specific role that touch's technologization plays in bringing about the utopia depicted at the start of the film. This haptocentric reading is further justified by the genealogy of surrogates provided both in the film's opening credit montage and in *A More Perfect You*.[17] Although *Surrogates* is set in an unspecified year not too far in the future, the credit montage begins with news stories and documentary footage taken from 14 years before the film's present, as newscasters voice over clips drawn from the headlines of real robotics research[18]. By splicing together fictional and real news footage, the film shows surrogate technology as an imminent outcome of contemporary developments in cybernetics, making the seamless interface between the operator's neural apparatus and the robot's sensory system appear credulous and inevitable.

Having established the viability of the film's central (impossible) technological premise, the news footage proceeds to describe the rapid adoption of surrogates and the resulting social

[17] For purposes of this essay, I will collapse the positioning of the surrogate technology offered by *A More Perfect You* onto the diegesis of *Surrogates*' fictional world.

[18] For example, the 2008 research by a team of University of Pittsburgh researchers which allowed a monkey to successfully control robotic arms via implants in its brain. These findings, originally published in *Nature*, were widely reported in popular scientific press outlets. See Meel Velliste, *et al*., "Cortical Control of a Prosthetic Arm for Self-feeding," *Nature* 453, no. 7198 (June 19, 2008): 1098–1101. doi:10.1038/nature06996. It could be argued that, by drawing on published and dated research, *Surrogates* actually does provide fixed temporal frame for the events that unfold throughout the film—if the trials with the cyborg monkeys were 14 years before the film takes place, the film would be set in 2022. The actual year is, however, never identified in the film. By contrast, in the graphic novel that the film is based on, the writer clearly and directly establishes the year 2054 as the setting for the story.

consequences that accompanied their widespread use. This chronology takes a decidedly technophilic and deterministic tone, parroting the expert testimony offered in *A More Perfect You*, with proponents touting the "evolutionary significance" and positive effects of surrogate technology. Echoing advocates of present-day brain-controlled prosthetics, fictional surrogate technology inventor Lionel Canter (James Cromwell) celebrated their potential to allow "physically disabled people...to operate fully synthetic bodies." Surrogates, then, began as attempts at a sort of restorative justice for damaged human bodies, offering to replace damaged or lost human limbs with fully-functional clones. Again, this is a wish repeatedly expressed around contemporary prosthetics research, where the machinic replication of touch is framed as an essential challenge to be overcome by engineering know-how. In his 2015 State of the Union Address, US president Barack Obama touted efforts by American scientists at "creating revolutionary prosthetics so that a veteran who gave his arms for his country can play catch with his kids again." A slide featured in the televised version of Obama's address depicted a robot hand akin to those shown throughout the *Surrogates* montage, with the accompanying text noting that "the Defense Advanced Research Projects Agency (DARPA) is building a new generation of prosthetics that can be moved with thoughts alone, and can feel the warmth of touch." The addition of complex computerized touch feedback, what Marvin Minsky once described in his hallmark essay "Telepresence" as the capacity to "translate *feel* into feel"[19], marks the passage of prosthetics research into a new era, tacitly declaring that touch is no longer a sense resistant to mediation.

The narrative positioning of technology as a humanistic agent whose advancement is driven forward by a desire to relieve suffering is a familiar one in transhumanist discourse, with the innocent and well-intentioned desire to humbly use technology as a way of merely giving back that which has been stolen situated in opposition to a more pernicious desire to use technology to augment the body's natural capacities. The movement's

[19] Minsky, 1980, p. 52.

staunchest proponents proudly embrace augmentation along with restoration, advocating for minimal constraints on the use of new technologies (see for example Stock's position on Germinal Choice Technology). *Surrogates*, however, indulges in a simple morality play, with the opening montage describing a quick weaponization of surrogates tech. The transformation from assistive to military technology drove manufacturing costs down, and surrogates soon became mass-marketed commodities, with their appeal driven by consumer desire to inhabit a body that would allow them to feel "total sensory immersion" in a remote environment. However, as Andy Clark explains, the border between restoration and augmentation is often difficult to pinpoint: "the line between these kinds of rehabilitative strategy and wholly new forms of bodily and sensory enhancement is already thin to the point of non-existence"[20]. *Surrogates*, in clearly delineating the shift from therapeutic to augmentic use, moralizes the latter, while valorizing the former.

Absent the impending threat of bodily injury, and able to inhabit a body that would perpetually conform to a normative visual standard of healthfulness and beauty, surrogates enabled a whole host of new experiences. The widespread adoption of surrogates seemed to provide a pathway to utopia, bringing about transformations in the lives of individuals, along with corresponding sociological shifts—in the film's present-day, 98% of the world's population "uses surrogates in their daily lives," with "crime, communicable disease, and discrimination" have been all but eliminated. As one newscaster explains, "problems that have plagued societies for centuries[…]solved almost overnight." This new utopia is, of course, not with its malcontents: continuing to comingle reality and fiction, the film shows Gregory Stock, CEO of the Signum Biosciences whose writing is also featured in *The Transhumanist Reader*, predicting that "many people will see this as the invasion of the inhuman." Those who refuse the technology ("meatbags") live walled-off from the rest of the populace in legally-designated, surrogate-free "reservations;" in these ghettos, residents "sacrifice many modern pleasures and

[20] Clark, 2013, p. 118.

conveniences to feel truly connected" with each other, rejecting all machines in favor of a "human" existence.[21]

A strategically-reconstructed touch, then, enables the genesis of the utopia depicted in *Surrogates*, while also feeding the sense of bodily alienation that causes its eventual downfall. Surrogate technology succeeds because it effectively engages in an impossible coupling between the robot's artificial sensory system and the operator's brain. But the pairing is instrumental and temporary, rather than absolute; the tactile data gathered by surrogate is not relayed with perfect fidelity to its operator. The interface provides the illusion of transparency, but it is a distorted haptic mirror, selectively shielding the operator from what would otherwise be painful and damaging contacts experienced by the surrogate body. The interface modulates the transmission of pain and pleasure; it encodes and enacts ideologies of sensation, permitting the desirable to pass through its filter, while banning and restricting the undesirable from coming into contact with the operator's sensorium. The surrogate touches, and the operator feels—but only after those feelings have been made to pass through an instrumentalized and ideologically-loaded filter. It cleaves tactile sensations into categories of 'good' and 'bad'—or transmissible and non-transmissible—and then refuses to relay those placed in the latter category. During a particularly violent chase scene, the surrogate body operated by the protagonist Detective Tom Greer (Bruce Willis) loses its arm. Both Greer and his surrogate are unshaken by the trauma; through the robot's eyes, he looks with disinterest at the electromechanical stump left behind by the injury before calmly walking over to the severed limb to retrieve the rifle held in its disembodied, lifeless hand. It is not that the robot's body is incapable of tactile sensations, but rather that algorithms beyond the control of the human operator ("failsafes" in the film's language, or what Derrida termed the "algorithms of immediate contact") govern the transmission of sensations from machine to human. The successful closing of the

[21] On the primitive reservations, bicycles are apparently not classed as machines, as their residents (referred to as "dredds") ride them everywhere.

surrogate-operator circuit depends on the robot's capacity to feel—the operator's ability to dexterously control the surrogate depends on the surrogate having a fully-synthesized haptic system, complete with hundreds of thousands receptors in a network distributed throughout the robot's skin, muscles, and joints. It is not the *perfect* extension of haptic system through the surrogate interface, then, that imbues the operator with this transhuman potential, but rather, the selective opacity of the interface—its ability to shield the operator from pain, while allowing pleasurable sensations to pass through the filter unaltered.

Transhuman Tele-existence

In robotics research, the push toward transhuman modes of bodily existence brought about a new appreciation of touch's immense complexity and centrality in the human mode of being. In the tele-existence approach to remote manipulation, furthered over the last three decades by Susumu Tachi, full corporeal re-embodiment hinges on the capacity to technologically synthesize touch. For Tachi, tele-existence "allows humans, who are assumed to be emancipated from the restrictions of time and space, to exist in a 'location' defined by inconsistent time and space, or in a virtual environment"[22]. By combining computer graphics with tactile sensation feedback and force sensation feedback, tele-existence facilitates the feeling not just of being present in a remote or virtual environment, but of acting on and being acted upon by the distant or computer-generated space. Though the theme of presence in virtual environments has been a common both in engineering and science fiction, Tachi's focus on the bodily sensations necessary to *act* in a remote environment has caused him to prioritize the type of research neglected by visualist virtual reality paradigm. His efforts attempting to embody these sensations in a functioning robot, and to effectively transmit those sensations to a human operator, caused him to recognize the immense and often understated complexity of the mechanisms

[22] Tachi, 1992, p. 8.

responsible for producing bodily sensations. Tachi thus gained an appreciation of touch, and its importance in grounding and enabling human existence, through the immense labor he devoted to reconstructing it. Echoing Tachi's perspective, Anybots CEO Trevor Blackwell, interviewed in *A More Perfect You*, explains his discovery of the human facilitated by robotics design: "the human hand, in fact, the human everything, is incredibly sophisticated. And you don't really appreciate it until you try to build something like it just how perfect it is." Osaka University robotics engineer Hirosh Ishiguro, also featured in *A More Perfect You*, frames his work in a similar fashion. Speaking through a humanoid robot designed to be a near-perfect copy of its creator, Ishiguro states bluntly: "what I want to do is understand what is human by building a robot."

Commodifying and Alienating Embodiment

During an early scene in the film, *Surrogates* calls attention to the importance—and financial costs—of reconstructing touch in a remote sensing robot. When an operator tries to insert a key into a keyhole using a base-model surrogate that lacks a developed set of tactile sensors, the remote unit struggles to fit the key into the hole. After a moment of quick frustration on the part of the operator, her surrogate hands the key to a more capable, higher-end unit, whose fingers possess the requisite dexterity to successfully accomplish this taken-for-granted task. The difficulties of making artificial hands and bodies that can function dexterously has long been identified as one of the crucial challenges of robotics; in General Electric Engineer Ralph Mosher's research on Cybernetic Autonomous Mechanisms (CAMs) from the 1950-60s, for example, he depicted robots who were "lacking human sensing" [23] experiencing difficulty performing simple tasks like opening a door, lifting a chair, rotating a hand-crank, and inserting a pipe into its fitting. Mosher's solution—a significant step that served as a crucial forerunner to contemporary haptics—was to equip the robot with

[23] Mosher, 1967, p. 5.

a sensing mechanism that could feed touch data back to a human operator ("force feedback for the sense of touch" as he described it), effectively separating the labor of data processing from the labor of muscular exertion. In *Surrogates*, this problem has been largely overcome through commercial investment and the corresponding technical advancement it brought, but a touch-deficient unit still proved capable of interrupting the cyborgian operator-machine circuit. Robust touch feedback, and the full haptic embodiment it brings, is situated as a commodity that serves to stratify the different social classes; although the vast majority of the world's population in the film uses surrogates, inequality persists, expressed as a differential in remote sensing capabilities. After the destruction of Greer's surrogate, he visits a cheap electronics store in search of a replacement model. Upon connecting to the new unit, he immediately complains that the robot's body "feels numb." The salesman responds: "It's only a base model, it comes with vision and hearing. You want other senses, they're extra." The sensorium, then, is reconstructed in fragments, according to the logic of the surrogate-as-commodity. Greer only fully confronts the artifice of the surrogate's sensorium when he encounters the wholesale absence of what have been understood in the western tradition as the 'lower-order' bodily senses; vision and hearing alone are not enough for Greer to successfully bridge the gap between his own sensorium and that of the robot. The robot's senses evolve in a reverse order from those of the human—where humanist accounts of touch valorize it for being the first sense to develop both in our collective and individual biological histories,[24] the robot gains seeing and hearing first, with the lower-order senses available as expensive upgrades on the "base" model.

The surrogate's capacity to feel, then, defines both its almost-humanity and its commodity status. But its inability to fully embody and replicate the human sensorium constantly haunts the

[24] In describing touch as the most "archaic" of our senses, Peters echoes the claims offered by haptocentric thinkers like Montagu. Similarly, touch is often praised for being the first sense to develop in the womb, grounding the individual's knowledge of the external world in a primary tactile encounter.

film's protagonist, troubling his relationship with his wife Maggie (Rosamund Pike), who continually insists that they interact only with their surrogates as mediating agents. The film juxtaposes images of their real bodies, isolated in separate dimly-lit bedrooms where the main piece of furniture is the crude, dental chair-like apparatus that facilitates connection to the remotely-manipulated body. Maggie continually insists that surrogacy provides a superior mode of interaction, as it allows Tom to see her as she wants to be seen, shielding her aging body from his. Surrogate Maggie frequently looks on non-surrogate Tom's body with a disdainful pity, as the physical markers of his age (wrinkled skin, grey beard, bald head) and vulnerability (Greer, after casting aside his surrogate, takes a predictably high share of beatings throughout the film, with his face gradually accumulating a collection of bloody scrapes) interrupt the illusion of timelessness Maggie creates for herself by inhabiting a perpetually-young artificial body. Tom, by contrast, increasingly finds surrogacy alienating and inadequate, marked by a feeling of absence rather than presence. Surrogate Maggie chides him for expressing an outmoded desire to interact without being mediated by the robots. Living only through the surrogates, Tom laments, is "not the same," portraying the human once again as something that exceeds and evades technological capture. Throughout the film, we only see Maggie's real body within the private space of her bedroom, where it is presented as an alien object she shamefully hides from both Tom and the rest of the world. Upon disconnecting from her surrogate, she is immediately beset by an anguish she manages by frantically consuming a cocktail of psychotropic drugs, which only serves to enhance the perceptual disjuncture between the surrogate body and her own. Beneath the polite veneer of civilized interaction, the relationship between the body and its perfected prosthetic provides a source of constant anxiety and struggle.

Surrogates presents a theory of the human grounded in a newly-articulated irreducibility of touch. The film does not claim that touch cannot be captured, stored, transmitted, and replayed, but that such a process reaches a limit when the biological body—its haptic system in particular—arrives at a point of incongruence

with its electromechanical double. The senses can be deceived, but only for so long. Unable to age, the surrogate body literally ceases to feel like the real body. As the human body loses its vigor, as perceptual acuity inevitably declines, the incongruence between unit and operator becomes harder to brush aside. The surrogate sensations that once seemed to be an analogue of the human body's own come to index decay and alienation. The threshold at which the human collapses onto the surrogate shifts, and in the process the human re-emerges as a distinct entity. The human irreducible to technology, that threshold between human and machine, gains expression in this technobiological convergence. As a marketed commodity, the surrogate is as much a social product as it is a technical one, a "compromise between engineers and salespeople"[25] whose success depends on the attitude of the operator toward these surrogate sensations. The surrogate becomes a means of accessing the human, of discovering the complexities and wonders of the human body by revealing that evades capture. Throughout the film, surrogate manufacturer Virtual Self Industries continually promotes the technology as a means of feeling totally and fully human; advertisements with slogans like "Plug in and Live" and "Life...Only Better" saturate the visual field of the public spaces the surrogates circulate in. Touch, then, folds within this commodity system: consuming the surrogate signals the tacit acceptance and intensification of the fundamental assumption underlying all media systems. If "media are about the deception of the sense organs"[26], the design of media systems aims at isolating and carefully-specifying the parameters of deception. But the human always refuses to be rendered immutable; it continually reasserts itself in the process evading capture. Rejecting the surrogate signals a failure in the deceptive capacity of the media system, indicating the need to tweak the technical and cultural mechanisms that legitimate the mediatic ordering of the senses. This technological rejection can be understood as part of a cultural feedback loop necessary for the continued suturing of sensory prostheses onto the human body.

[25] Kittler, 1999, p. 2.
[26] Kittler, 2010, p. 38.

A Transhumanist Haptics?

Although *Surrogates* ultimately ends by indulging a clichéd luddite impulse to cast off technology, read in conjunction with the celebratory tone of *A More Perfect You*, it advances a decidedly transhumanist vision. Situating the surrogate interface as the next step in a genealogy of embodied interfaces suggests an inevitability to the technomediatic future it depicts, driven by the seductive promise of human extension through the technologies of remote touching. The strident faith transhumanism places technology's capacity to march forward uninterrupted denies the existence of intractable biological limits, lending credence the film's impossible promise to fuse the haptic system of a human with that of its biological other. However, while the vision of a society upended by the widespread adopt of body-extending and -enhancing surrogate interfaces may seem radical at first glance, when compared to other scenarios imagined by transhumanists, it seems conservative by contrast, as it feeds forward a rather conventional and limiting notion of the body's senses. Hans Moravec, in his essay "The Senses Have no Future", suggested that the human body's biological senses pale in comparison to those modes of sensation that will be demanded by the vast computational environment of cyberspace. So while he predicted, in the short term, the sort of vast improvements in telepresence and tele-existence depicted in *Surrogates*, an advanced "telepresence harness" would be just a stopgap measure in the inevitable need to leave behind the body's conventional senses altogether—even in the Moravec's scenario of the brain-in-a-vat migration of the human into a realm of pure data, the need to process data as images, sounds, tastes, touches, and smells would serve as a hard limit on the bandwidth of human consciousness. In this situation, the senses would have to be transcended and overcome, or else the human species would face an existential crisis: "biological humans," as Moravec explains, "can either adapt to the fabulous mechanisms of robots, thus becoming robots themselves, or they can retire into obscurity"[27]. Even touch, which

[27] Moravec, 1997.

has been said to provide the "reality sense par excellence"[28] would present an obstacle to the continued survival of the human. The long arc of the transhumanist historical narrative, then, promises not to virtualize but to eliminate that sense repeatedly valorized as the most fundamental to our constitution as humans.

Transhumanism, however, frequently pushes a dogmatic and rationalistic determinism beyond the point of absurdity, and we need not accept its fantastical pronouncements as established fact. To close, then, let me return to the more prosaic time horizon of touch depicted in *Surrogates*, as the film's confrontation with the sociocultural consequences of synthetically reconstructing and extending touch raises vital questions about the past, present, and future of haptic media. Reading the surrogate interface as a type of imaginary haptic media refuses the positioning of touch as something possessed and defined by a fundamental irreducibility, depicting it instead as a mode of perception that has already been technoscientifically specified and synthesized, part of a longer history of attempts at coding, transmitting, and replaying haptic sensations. As an imagination of possible media, *Surrogates* expands outward our conception of the possibilities for technologically mediated touch, depicting a seamless and easy merging of human and remote body that tacitly suggests touch is a sense hospitable to mediation. Tactility, in the film, attains a new ontological status as a dehumanized perceptual modality capable of being thoroughly alienated from the body, in contrast to its depiction as a fundamentally and inalienably human mode of perception in media theory.

The present state of haptics technology might provide a window into this disjuncture: to date, the transformational effects of computerized touching have been relatively contained, to the extent that we still do not have a widely-accepted categorization scheme for haptic media. In spite of a technical history that spans more than five decades, today's technologies of computerized touch are not so clean: rather than passing touch data directly into the brain, they depend on a messy and often imperfect set of

[28] Parkhurst, quoted in Herring, 1949, p. 203.

electromechanical mechanisms (vibration-producing motors, force-feedback joysticks, and, in some cases, precisely-controlled bursts of electricity intended to directly activate a nerve) to target individuated sites distributed unevenly across the space of the body. The haptic image they transmit is blurry and filled with gaps. They are frequently cumbersome and expensive, and while they seem to be pushing toward some inevitable final state of improvement, this forcasted future has been forecasted for decades, and still hasn't yet arrived. That crucial threshold past which the self achieves full haptic embodiment in the machine never quite seems to get crossed for too long. The possibility of a high-fidelity, distanced touch exists, in our cultural imaginary, as a perpetually unrealized promise—a concept that has been proven frequently in the design lab, but has not failed to migrate beyond its walls. Andy Clark's 2003 *Natural-Born Cyborgs*, for instance, described a transhumanist body in a state of flux, on the cusp of smashing down and rebuilding the old borders between self and world by the suturing of bleeding-edge telepresence interfaces onto its sensory apparatus. And although none of these technologies—many of which were in the prototype stage at the time of his writing—have achieved a ubiquity that would allow us to register the impact on the everyday, Clark's work itself, moreso than the technologies it confronts, represents an attempt to renegotiate touch's status as a sense inhospitable to mediation technologies.

It is here, in recalling the various imaginaries of technologized touch, that the concept of haptic media achieves its utility: by treating the relationship between touch and mediation as a product of a technoscience that exists embedded within rather than apart from culture, the category of haptic media allows us to push back on the instrumentalization of touch advanced by its technoscientific deployments, recognizing touch's ongoing reformatting as a normative process expressed simultaneously through interfaces, whether real or imagined.

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The (care) robot in science fiction: A monster or a tool for the future?

Aino-Kaisa Koistinen

According to Mikkonen, Mäyrä and Siivonen, our lives are so pervaded with technology that it becomes important to ask questions considering human relations to technology and the boundaries between us and the various technological appliances that we interact with on a daily basis:

> For example, as pacemakers and contact lenses technology has become such an intimate thing that it can be said to be a foundational aspect of our humanity. It is hard, or even impossible, to understand the meaning of our human existence if the role of machines in our humanness is not taken into account. Pointedly, we can ask: "Are we humans machines – or at least turning into ones?" Or in reverse: "Can machines become humans, thinking and feeling beings?"
>
> What is essential is not how realistic or believable the assumptions considering humanization of machines or the mechanization of humans inherent to these questions are. *What is essential is that these questions are asked altogether.*[1]

There is one fictional genre, that of *science fiction*, that is particularly suitable for asking these kinds of questions. Indeed, science fiction, as the name of the genre already suggests, is preoccupied with the imaginations of scientific explorations. These explorations are often realized through stories of

[1] Mikkonen et al., 1997, 9, transl. by the author, emphasis added.

technology, such as different kinds of robotic creatures. Moreover, the very core of science fiction is the imagining of possible worlds and futures that are not mimetically bound to the world that we live in yet often comment on contemporary cultural phenomena[2]. Robots and technology are, indeed, usually used in the genre to discuss topical fears and anxieties – but also hopes – considering technological developments.

Today science fiction's technological imaginations and the technological developments that we face in our lived realities seem to resemble each other more than ever before, making it important to study these connections between science fiction and science facts. Indeed, many of the current technological developments have been presented to us by science fiction narratives well before they turned into the reality of today, making the genre an important platform for speculating on new technologies and their possible effects on humanity[3].

Quite recently, one of science fiction's imaginations, that of the care robot, is quickly turning into a lived reality. When introducing these kinds of robots in our daily lives we need to consider how they have already been imagined in science fiction, as these imaginations can be used to make visible the problems as well as promises inherent in close relationships between humans and machines.

The genealogy of robots

Before presenting some examples of science fiction's care robots and the pressing cultural questions they pose, we need to consider the history of fictional robots. The term robot was developed and popularized by Czech author Karel Čapek in his play "R.U.R." (Rossumovi Univerzální Roboti, engl. Rossum's Universal Robots) in 1921. The term is derived from the Czech

[2] See e.g. Attebery, 2002, 4–5; Jackson, 1995, 95; Larbalestier, 2002, 8–9.

[3] On science fiction narratives turning to science facts, see Kirby 2010; Penley, 1997; Telotte, 2014, 186–187.

word *robota* referring to the work performed by slaves. In Čapek's play, robots are *humanoids* or *androids* (i.e. they appear human) that eventually turn against their human masters. Although the term *robot* usually refers to technology as a tool designed for the use of humans, science fiction stories often represent robots that develop beyond mere tools and rebel against their creators. As such, they represent a typical theme of the genre – technological developments gone too far, making these robots monstrous and threatening figures.[4]

There is, however, an even longer tradition of imagining scientifically or technologically constructed creatures that can be traced back to at least the 18th Century, when the constructing of automatons created in the human form were a fashionable past-time in Europe. In the Jewish tradition, we can also find stories of the Golem, a humanoid constructed from clay, that date back to the early modern period. In 1818, Mary Shelley famously imagined the Frankenstein's monster – a human-like creature constructed by a mad scientist – which has become one of the staples of Western popular culture, and is probably one of the most known stories of science and technology gone too far.[5] Shelley's novel is, in fact, often considered the first science fiction novel, where gothic themes merged with questions of science[6].

Since *Frankenstein*, different kinds of robots, androids and *cyborgs* (i.e. hybrids of technology and flesh) have taken the popular culture by storm as monstrous creatures. In 1927, the humanoid robot Hel/Maria (played by Brigitte Helm) tantalized human men with her erotic performances in Fritz Lang's *Metropolis*, making it clear that when a robot gains a

[4] On the term "robot" and Čapek's play, see Mikkonen et al., 1997, 11; also Graham, 2002, e.g. 102; Paasonen, 2005, 248n43. For more on robots/technology as a threat, see Dinello, 2005; Graham, 2002, 5–6; Kirman et al., 2013. On robots/machines as monstrous, see Paasonen, 2005, 26–29, 38.

[5] On this genealogy, see e.g. Mikkonen et al., 1997, 11; Graham, 2002, 62–108.

[6] Attebery, 2002, 12.

human form, it cannot escape the questions of gender and sexuality. This theme had, however, already emerged in, for instance, *L'Eve Future* (*Tomorrow's Eve*) by Auguste Villiers de l'Isle-Adam (1886). The novel presents us with a narrative of the replacement of a human woman by a more perfect machine copy.[7]

This idea of replacing the human, and the woman in particular, has since been seen in films like the aforementioned *Metropolis* and *Stepford Wives* (dir. Ira Levin 1975), and has remained one of the most often articulated fears in science fiction. Moreover, the developments of robots are connected to the fears of replacing human beings also in the very literal sense that they replace human workers in factories – and now, more recently, in care – both in science fiction and in our everyday reality[8].

Human-like robots as both threatening and hopeful monsters

Later, in the 1970s, cyborgs such as the Bionic Man and the Bionic Woman – and even their companion, the Bionic Dog – represented more hopeful imaginations of technology. These cyborgs were technologically improved with *bionic* limbs which saved their lives. In the 1970s prosthetic limbs were being explored upon in medicine, and these bionic creatures showcased the popular culture where this sort of human betterment might eventually lead.[9] Indeed, since the 1970s, synthetic organs (that are aptly called bionic) have been attached to living human beings[10].

[7] On monstrosity as well as cyborgs/robots and gender, including *L'Eve Future*, see Paasonen, 2005, 27–28, 35–54. On *Metropolis*, see also Graham, 2002, 177–181.
[8] On news about robots replacing workers, see e.g. Spence, 2016; Wakefield, 2016.
[9] Geraghty, 2009, 63; Koistinen, 2015a, 36; 2015b; Paasonen, 2005, 21–34; Telotte 2008, 17; 2014, 32.
[10] See e.g. "The Bionic Eye".

The most memorable human-like robots in the 1980s must be those seen in *Terminator* (James Cameron 1984) and *RoboCop* (Paul Verhoeven 1987) that offer us hyper-masculine male machines in contrast to the sexualized females of *L'Eve Future*, *Metropolis* and *Stepford Wives*[11]. Also, who could forget the humanoid *Replicants* of *Blade Runner* (Ridley Scott 1981), which represented the machines as thinking and feeling creatures, as almost human beings? These two aspects, the capability of independent rational thought and emotion have, in fact, been popular ways to differentiate humans from machines in science fiction – but also to question this differentiation[12].

Since the 2000s, popular culture's cyborgs, machines and other technological monsters have been created as more and more complex creatures and, also, more and more like us humans. Machines in, for example, *Battlestar Galactica* (2004–2009) are intelligent and emotional beings that can *pass for human*[13] and therefore also offer more varied representations of gendered embodiments than many of the narratives considering humanoid machines/cyborgs before them. In these narratives, the monster can also be a hopeful one, a creature that is guiding us towards a better tomorrow. Even though monsters are commonly understood as something to be feared, they can also be sources of great promise and hope and help us to think about what we otherwise cannot think about (as a colleague of mine, Line Henriksen, put it at the "Monsters in Art" event organized by the *Monster Network* at Stavanger library in April 28, 2016).[14]

[11] On masculine male machines and erotic female machines, see Balsamo, 2000, 150–156; Kakoudaki, 2000, 166; Paasonen, 2005, 50.
[12] Balsamo, 2000, 149; Booker, 2004, 39–40, 95–96; Koistinen, 2011, 2015a, 37, 2015b; Paasonen, 2005, 27, 32–38.
[13] On machines and passing for human, see Koistinen, 2011; 2015a; and Hellstrand, 2015.
[14] For more on hopeful monsters, see Haraway, 1992; more specifically in science fiction, see Graham, 2002, 11–16. Like "monster", the concept of "cyborg" has also been used as a hopeful figuration for rethinking, for instance, different cultural dichotomies, see Haraway, 1991; also Graham, 2002, 200–234.

This history of science fiction shows us that we as humans have always been fascinated by creating the machine in our own image. Perhaps this is a sort of God-complex, or perhaps we are just so perplexed about our own humanity, that we feel the need to re-create our image through technology in order to understand our humanness.[15] Be it as it may, science fiction's stories make visible the problems that are inherent in making the machine in our own image. That is, the question of representation: In whose image should we create these machines that, as they become humanoids, also embody markers of, for example, gender, ethnicity, age, ability/disability and class. In this sense, creating humanoid machines is a deeply normative process, where we are reproducing what we consider a "proper" human being.[16] In this sense, these imaginations also allow us to ask deeply ethical and political questions about what kinds of bodies that are allowed to pass as "legitimate" human bodies.

This creates an interesting connection between science fiction and the care robots of today. Judging from the news there seems to be two strands in the development of care robots: creating robots that appear like humans or are, in some way, relatable as human-like figures (i.e. have a recognizable head, limbs and torso, even though they clearly could not pass for human), and the creation of robots that are designed to appear more like machines[17].

Science fiction and the questions of care

[15] For example, Elaine L. Graham, 2002, provides a comprehensive study on how machines and monsters have been created as representations or visions of what it means to be human. On the representations or imaginations of humanlike machines, see also Hellstrand, 2015; and Koistinen, 2011; 2015a; 2015b; 2015c.

[16] For more on humanoid machines and questions of normativity and/or gender, see Graham, 2002; Hellstrand, 2015; Kakoudaki, 2000; Koistinen, 2011; 2015a; 2015b; 2015c; Paasonen, 2005, 26–51.

[17] In the Finnish press, care/service robots have been written about, for instance, by Juhola, 2016; and Pihlman, 2016.

Finally, I wish to present you with a few examples of science fiction's care robots and the sort of cultural allusions that they evoke. In the genre, robots and other machines have quite often been imagined as doctors, medical assistants, cleaners, nurses and all-around helpers. A well-known example of this all-around-helper is the popular Robbie the Robot in the 1956 film *Forbidden Planet* (dir. Fred M. Wilcox). Just like the many other types of robots in science fiction, these care robots can also be sources of joy or anxiety. Very recently, at least two audio-visual science fiction productions have discussed care robots in a manner that resonates with contemporary discussions of care; the Swedish television series *Äkta Människor* (2012–2014) and the film *Robot & Frank* (Jake Schreier, 2012). Both of these productions also raise questions related to the ethical aspects of care today, such as, who decides what kinds of care an elderly person needs, and who defines what is considered "the right kind of" care.

Both *Äkta Människor* and *Robot & Frank* frame their discussion of care mainly around an elderly man and his robot aid/companion – or companions in the case of *Äkta Människor*. What is different between the series and the film is that in the series these care robots (that are, interestingly enough, called *Hubots*) are human-like in their appearance, whereas the robot in *Robot & Frank* is (even though relatable in the sense of having a torso, limbs and a head, and speaking in a human-like voice) is significantly more like a machine.

In *Äkta Människor*, the human appearance also brings forth questions of gender and the gendered labour of care. The old man, Lennart (played by Sten Elfström) is initially happy with his male companion robot Odi (Alexander Stocks). However, as Odi malfunctions, Lennart is faced with the harsh reality of having to purchase a new companion. His family chooses a new, more efficient model, a female robot called Vera (Anki Larsson). Vera is a stereotypical representation of feminine care; an old, plump woman with an apron and a strict expression. Lennart and Vera, nevertheless, do not get along, which explicitly articulates the

question if the person receiving care has the right to choose what sort of care they want.[18]

Similarly to Lennart and Vera, Frank is initially unhappy with the care robot that his son purchases for him. In both *Äkta Människor* and *Robot & Frank* we nevertheless also see a bonding between a human and a machine. Although Lennart never really gets used to Vera, he considers his other robot, Odi, as a friend. In the film, Frank also grows fond of his robot. In both productions, the men finally also lose their companion robots, making visible the powerlessness of these old men in terms of deciding for their own care.

These sorts of discussions are highly relatable to the Finnish context today. Recently the Finnish national broadcasting company YLE presented news stories concerning how certain Finnish cities are considering replacing the personal assistants of people with severe disabilities with a different sort of care – a "family carer". Unlike the personal assistant, these family carers are not allowed to leave the apartment where they work, significantly limiting the mobility of their clients with, who cannot go outside without their assistants.[19] What, then, would happen, if these family carers were replaced by machines? Would it bring more or less freedom to people in need of constant care?

Both *Äkta Människor* and *Robot & Frank* ultimately leave it open, whether the care robot is a dreadful or hopeful monster, or merely a tool for humans to use in our increasingly technological future. With fictional narratives we are nevertheless able to speculate on the problems and possibilities of these emerging technologies. These speculations can surely offer useful information also to the persons designing actual (care) robots today. To return to the quote by Mikkonen, Mäyrä and Siivonen: "What is essential is not how realistic or believable the assumptions considering humanization of machines or the mechanization of humans inherent to these questions are. What

[18] See also Koistinen, 2015c.
[19] Seppänen, 2016.

is essential is that these questions are asked altogether." And this is something science fiction can certainly do.

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Cooking for perfection: Transhumanism and the mysteries of kitchen mastery

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How is such a mundane everyday activity as cooking redesigned into biohacking through the concept of transhumanism, and how are foodstuffs of different sorts framed in ways that allow them to become part of such a "biohack design"? This article will elaborate on these questions and thereby contribute to understandings of contemporary practices of biohacking through the lens of transhumanism. As we describe below, biohacking is a diverse and emergent movement that pulls people together in the joint enterprise of investigating the boundaries of what people can do on their own to learn more about their bodies. Intrinsic to this movement is the transhumanist idea that the human potential can develop beyond what we today acknowledge as bodily boundaries. Thus, transhumanist philosophies lend themselves well to deeper understandings of these phenomena. As Max More states in the introduction to his edited book "The Transhumanist Reader", human nature as we know it, is emergent and merely one point on an evolutionary pathway that we can learn to re-shape in ways that we deem desirable using new technologies and ideas.[1]

[1] More & Vita-More, 2013.

This article builds on a focused ethnographic engagement[2] with a biohacking event, the 2015 Biohacker Summit in Helsinki, Finland, aimed at using food and cooking techniques as a measure to enhance the human body and mind. The organisers of the event chose to frame biohacking as part of a transhumanist agenda by inviting the well known transhumanist thinker Max More as a keynote speaker on several occasions during the event, including an "Upgraded dinner" workshop where two of the authors (Martin Berg and Vaike Fors) participated. In order to produce intense data during this event, we used video cameras to observe the different activities and record interviews and dialogues with participants to create "short-term [ethnographic] research engagements"[3] that benefit from close and intentional focus on the often unspoken details of what people actually were doing. The method allowed us to actively take part in the event in a deliberate and interventional manner, and to theoretically engage with both the activities and the analysis of the produced research material (a third author, Jonnie Eriksson, participated in this latter step).

The upgraded dinner workshop was described by the organisers as a "future food lab taking food, preparation, cooking, and eating to the next level with the latest science and kitchen chemistry". [4] During this workshop various biohacking techniques were said to be used "to preserve quality and increase absorption of ingredients such as foraged plants, wild game, and seasonal local produce". [5] Along with roughly forty other participants, we engaged in the preparation of a 6-course dinner under the guidance of wild food chef Sami Tallberg and Biohacker's Handbook authors Jaakko Halmetoja and Teemu Arina.[6] During the fieldwork we specifically studied how the biohackers approached and engaged with ingredients and their preparation, and as a consequence how they chose to represent

[2] Wall, 2015.
[3] Pink & Morgan, 2013, p. 353.
[4] http://biohackersummit.com/q-a/ (accessed 2016-11-28)
[5] Ibid.
[6] http://biohackingbook.com (accessed 2016-11-28)

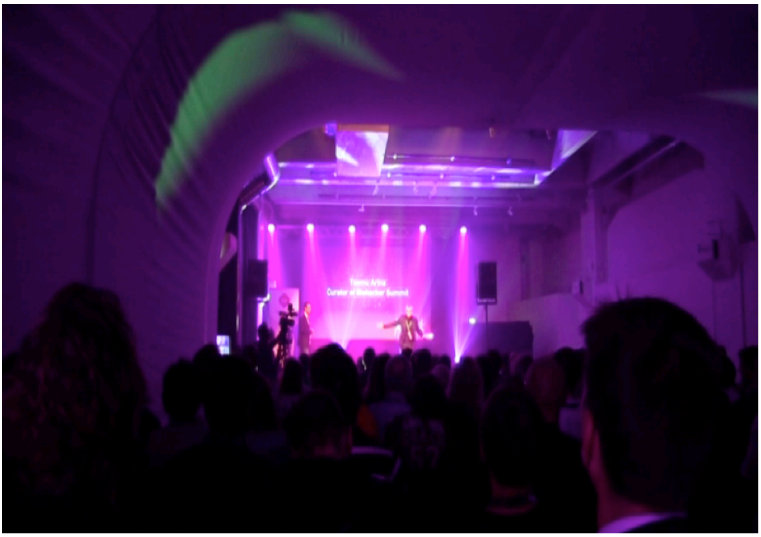
biohacking to an audience. The reconfiguration of the practice of cooking into a biohacking/transhumanist shape was conceptualised into a question of both mastery and mystery while adding three main components to the cooking practise through protocols and recipes: aesthetics, medicine and alchemy. This has led us to the conclusion that contemporary transhumanism is not always in its consequence about cybernetics, DIY science and technologically enhanced life (as it has been prescribed elsewhere, see more below), but can also be viewed as something that goes beyond technological revolutions and instead relates to a more ancient legacy.

In this article we investigate how this re-configuration takes place, what ingredients were added to construe the event, what happens when the everyday practice of cooking is redefined as "biohacking", and how it is explained by the organisers. It could be argued that biohacking is not by any clear and distinct definition connected to transhumanist thinking. However, this phenomenon is part of the movements and scientific trajectories that are directed towards investigating how the body can be transformed into something not yet known with the help of emergent technologies. In addition, biohackers and transhumanists are not fixed groups of people, advocating specific routes to bodily enhancement. For these reasons, we suggest that by analysing how actors within these loosely defined groups enact the ideas in new settings and configurations there is potential to understand the future of transhumanism and to detect contemporary directions. The article is organised as follows: In the next sections, biohacking practices and ideas will be discussed in relation to both contemporary thoughts on DIY science and historic accounts of transhumanist ideas. What follows is an ethnographic account of the upgraded dinner workshop with particular attention being paid to how transhumanist ideas and assumptions come to life in how ingredients are presented, prepared and described in relation to the human body. From the empirical section, we move on to an analysis of the ethnographic engagements where we focus on how a tension between mystery and mastery is played out during the workshop and how it relates to transhumanist ideas. In the

concluding section, the article is summarised and further discussed in relation to overarching questions of contemporary practices and consequences of transhumanism. But first we need to explain how the cooking was presented as a biohacking event in the first place.

Cooking with information

At the formal opening of the event "Biohacker Summit" in Helsinki, Mr. Teemu Arina was introduced as the curator of the event. Before his entrance to the stage, music was playing loudly, and the light show as well as the auditorium itself were designed in a way that created a sense of being invited into a futuristic high-tech showcase (see picture 1). Arina himself appeared on stage, making dance moves, while the audience cheered and applauded. During the introduction he explained the goal and purpose of the event as a dive into the biohacker world, and urged us to think about the human being through "system thinking" and biohacking as "the art and science of optimising the body and mind and performance". This includes an understanding of the body as a carrier of information that is "changing and affecting us, and our offspring as well", a way of thinking that could be concluded in a statement that Arina asked us to think about: "we are information". This conception implies that the body, as all information technology devices, also can be hacked to enhance performance. A similar thought surfaced at the final stage of the cooking workshop when Arina reflected upon what makes cooking upgraded, in front of the dinner guests. Relating the cooking event to molecular gastronomy that brings out flavours and new kinds of culinary experiences, Arina referred to the upgraded cooking event as the next phase for cooking since it takes into account what the food does to us as human beings and bodies. It is thus a way of hacking both the food and the body by carefully noticing how they interact and affect each other.



Picture 1. [loud music playing] "ladies and gentlemen, the curator of Biohacker Summit, please welcome to the stage, Mr Teemu Arina!" [Loud music playing again, Mr Arina jumps up on stage making dance moves]. Photo: Vaike Fors and Martin Berg.

The practice of cooking is thus conceptualised as an interplay between culinary experimentation and curious ingestion that brings about an experience through which a certain form of learning is assumed to take place. During the introduction, the upgraded dinner workshop was presented as part of a "learning circle" that lies at the core of biohacking practices. From the stage Arina let us know:

> Biohacking is all about the self experience [of] different types of systems and interventions into the biological machinery, or whatever you call it, and you might have a hypothesis, if I do that that will happen. But you don't know until you try. I might have a scientific understanding of it, in research papers they might ask different kind of experts, but really you don't know until you test.

However, if this testing will lead somewhere there is a need to combine it with the measurements of technologies like "sensors,

wearables and implants" that help you to "draw a map of yourself and then use that map to gain an even better self experience". From this point of view, food is a way of hacking into the "bodily machinery" on a biomolecular level, a route to upgrade yourself. Accordingly, the practice of cooking in the "upgraded dinner" workshop was reconfigured into a biohacking shape, which resembled a laboratory context where individuals can experiment with their bodies. At the very foundation of biohacking thought lies an assumption that biohacking practices can help moving beyond not only institutional constraints but also the boundaries of the body and what it could possibly become in terms of enhancement. Thus, taking biohacking into the kitchen may be looked upon as part of DIY movements in society where people, through the access to scientific equipment, engage in so called "garage biology" or "do-it-yourself biology."[7]

Biohacking: do-it-yourself science?

In DIY movements biohackers redefine science into do-it-yourself practices, and private homes and community spaces turn into sites for biological experimentation. In his study of "Biologigaragen" in Denmark, Morgan Meyer noticed a hacker space for people who are interested in doing science, and notes that this place for garage biology is an "interesting place where experimentation with science and technology as well as new forms of sociability seem to occur concurrently".[8] Through these practices, do-it-yourself biology is seen as both democratising science[9] and unleashing creativity.[10] Paralleling this movement with the punk movement, with its emphasis on non-profit, open source and open access, Meyer concludes:

> Do-it-yourself biology thus aims to constitute a distinct and political form of self by providing people with access, by enabling

[7] Delfanti, 2010.
[8] Meyer, 2013, p. 118.
[9] Wolinsky, 2009.
[10] Ledford, 2010.

> them to transform themselves into active producers of science, by making their bodies and ailments more knowable, and demonstrating that one *can* do it yourself.[11]

In addition, the DIY biology movement is said to be promising regarding "the establishment of a participatory innovation process beyond the current producer-consumer distinction"[12] and at the same time it can "foster new practices and transversal collaborations between professional scientists and amateurs".[13] The only concern this far has been about personal and national safety and issues about privacy. Not much, however, is said about DIY biology in relation to the biohacker community that is expressed by Teemu Arina and his crew at the BioHacker Summit. In their assessment of the "DIYBios" in Europe, Seyfried et. al. notes that it is a well established community of a dedicated core of enthusiasts that are here to stay despite the "hype generated in the media around 'biohackers' in the past years".[14] The main difference between "DIYbios" and the "biohacker hype", as Seyfried et. al. claims, is the resistance among the former to commercialise their products and skills in the way that is common in the biohacking community, often associated with test-beds for biotechnology start-ups.

Considering biohacking as part of the DIY movement makes you wonder if the biohacking kitchen is to be understood as a provocation toward more institutionalised healthcare systems or more of a commercialising activity? This alleged divide between rebels and profiteers within the DIY community is contested by for instance sociologist Alessandro Delfanti,[15] who argues that this political conceptualisation of DIYbios, as simply a rebellion against neoliberal ideologies, is a simplification that usually ends up in a dangerously easy commitment to open science as good per se. Instead, Delfanti suggests that the changes seen in the

[11] Meyer, 2013 p. 132.
[12] Seyfried et. al., 2014, p. 551.
[13] Landrain et. al., 2013, p. 115.
[14] Seyfried et. al., 2014, p. 551.
[15] Delfanti, 2013.

footsteps of the biohacker and DIYbios movements is a complex combination of life sciences and information technologies that brings more distinctions into play than simply freely sharing information, such as intense relations with the media, hedonism, creativity, passion, communitarian spirit, individualism, and entrepreneurial drive.[16] In this article we take Delfanti's argument seriously and approach the biohacker kitchen as part of what Delfanti sees as emerging in the wake of early DIY/biohacker movements, with an ambition to move beyond simplistic ideas of an either-or relation between these phenomena. Biohacking practices in this context seem to build on transhumanist ideas and values since the presented biohacking techniques and practices often aim at "unleashing" the human potential from its bodily constraints. In the next section we will elaborate on to what extent biohacking in the upgraded kitchen draws on core transhumanist ideas about the human potential and the possibilities to engage in nearly alchemist laboratory transformations of wild forage

Transhumanism: From do-it-yourself to do-yourself-over

As a prime example of how of proponents of transhumanism understand their own purposes, "The Transhumanist Declaration"[17] states the following:

> We envision the possibility of broadening human potential by overcoming aging, cognitive shortcomings, involuntary suffering, and our confinement to planet Earth. We believe that humanity's potential is still mostly unrealised. There are possible scenarios that lead to wonderful and exceedingly worthwhile enhanced

[16] Delfanti, 2010, p. 108.

[17] The declaration has been redrafted over the years. It was originally created in 1998 by 22 international authors, including prominent theorists such as Max More, Natasha Vita-More, Nick Bostrom and Anders Sandberg.

> human conditions. /…/ We favor morphological freedom – the right to modify and enhance one's body, cognition and emotions.[18]

The declaration primarily focuses on how technology provides tools for overcoming biological shortcomings, in the "development of means for the preservation of life and health," and argues for policy making which will respect individual rights to "use or not use techniques and technologies to extend life". In an alternate version, which currently functions as a manifesto for the World Transhumanist Organization and Humanity+, the Transhumanist Declaration sets the goal of "redesigning the human condition," liberating humanity from its biological limitations, including aging, and for individuals "to extend their mental and physical (including reproductive) capacities and to improve their control over their own lives."[19]

The issue of such links between technology and humanism is interesting to consider with respect to the transhumanist characteristics of the upgraded dinner workshop. Putting their ideals in historical context, adherents of transhumanism often stress their Enlightenment roots (a legacy which is, however, sometimes problematic and contradictory).[20] This implies that ideals of rationality, secularism, liberalism, optimism and progress, along with an affirmation of the benefits of science and technology, direct their striving for self-improvement and "morphological freedom," both as an individual right to pursue one's happiness, and as an evolutionary prospect for the human species to become posthuman. Not least the Marquis de Condorcet's optimistic notion of the endless perfectibility of mankind (published in 1795) can be cited in support of the relevance of such ideals to the quest for longevity or even

[18] More & Vita-More, 2013, pp. 54–55.
[19] "The Transhumanist Declaration": http://humanityplus.org/philosophy/transhumanist-declaration/ (accessed 2016-11-30)
[20] Hughes, 2010.

immortality of man; they are, as it were, what puts the humanism in transhumanism.[21]

Certainly there are significant aspects of these humanist ideals retained in the ideology of transhumanism. However, in the Age of Enlightenment, the idea of progress was primarily set in a political, social and moral context – as a matter of education or reform, not physical transformation. Only rarely, and then obliquely, did leading Enlightenment thinkers speculate on actual life-extension techniques. If nothing else, Enlightenment philosophers yet lacked the scientific support of Darwinism which would define later formulations of biological transhumanism in J.B.S. Haldane or Julian Huxley, or a sufficient degree of technological development which would make any bioengineering plausible. Ideas of prolongevity were indeed prevalent in the early modern era, and they did fit with Enlightenment ideals of progress and perfectibility; but they were rather placed against the background of earlier ruminations on longevity and immortality and seen in the medicine of popular, commercial culture, aided by the spread of printed books, and thus by no more advanced technology than the printing press.[22]

None of this negates the project of transhumanism, quite the contrary. Scientific and technological developments are not what properly define transhumanism, but more appropriately its goals, its visions and its ideological underpinnings. It is not by simply adding science and technology to a humanist ideology that transhumanism develops. Rather, transhumanism draws from a deeper well. Its key notions of physical and cognitive transformation (especially at the level of the individual), which are put into practice in the upgraded dinner workshop, are more readily recognisable in a tradition much-maligned by enlightened, modern minds: alchemical medicine, or iatrochemistry, pioneered by Jean de Roquetaillade (ca 1310–70) and famously championed by Paracelsus (1493–1541) and Jan Baptist van

[21] More, in More & Vita-More, 2013, pp. 4, 9–10. See also Bostrom, 2005, pp. 2–3.
[22] See also Yallop, 2016, pp. 10–18.

Helmont (1579–1644) parallel to the scientific revolution. The iatrochemists sought to extract the vital essence out of natural materials such as water, plants and minerals (the *aqua vitae*, the *lignum vitae*, the spagyric tincture or elixir, the vegetable stone etc.) in order to promote health, cure disease and ensure longevity.[23] By employing techniques of harnessing the secrets of nature, ordinary objects and even poisonous materials could be transformed into beneficial medicine with the prospect of wondrous results. This quest for material means of altering and improving man's physical condition, using knowledge of nature to perform something like miracles for the benefit of mankind – those "wonderful and exceedingly worthwhile human conditions" – is at the heart of transhumanism.

From the foregoing, we can conclude that our particular biohacking event – the upgraded dinner workshop – can be understood as part of the transhumanist trajectory as it is developing in relation to inherent dualities between nature/technology on the one hand, and on the other hand between ideas based in the Enlightenment's focus on rationality, progress and perfectibility and, as we suggest, more ancient notions of physical and cognitive transformation which can be traced back to an alchemical tradition. From this perspective, this event could also be seen as part of what Delfanti[24] understands as unfolding in the wake of earlier biohacker and DIY movements, inspired by, but also transgressing, more conventional ideas of transhumanism. In the empirical examples below, we will dig deeper into the practical consequences of such a rhetorical, philosophical and historical foundation. In the succeeding sections, we will analytically approach this event, how it is presented, organised and practised, thus focusing on finding out what ingredients is put together to form and construe transhumanist cooking.

[23] See Principe, 2013, pp. 69–71, 127–131; Hedesan, 2013; Sinclair, 2013.
[24] Delfanti, 2010.

Entering the transhumanist kitchen

The empirical descriptions in this section are selected through an analysis of the research material that two of us (Martin Berg and Vaike Fors) produced during our participation in the upgraded dinner workshop at the Biohacker Summit. Through our analysis we focused on the practice of presenting and organising the event to produce deeper understandings of the concepts and structuring ideas that framed the activities that were played out. This means that we were more concerned with the organisers' roles and activities than the participants' in this case and our examples are carefully picked to give a picture of how transhumanism is activated in the service of biohacking movements.

The aesthetics of the upgraded dinner

After some detours in the old meatpacking district in Helsinki, we arrived at the temporary "food lab" a late September afternoon in 2015. In the garden outside the venue we encountered a man practicing tai chi while wearing a chef's jacket. We soon realised that we were looking at Sami Tallberg, the chef that should guide us through the workshop. He seemed very focused, as if he was to preparing for something more profound than arranging for the upcoming workshop. We passed by him discreetly, entered the premises and sat down in a sofa to wait for the rest of the participants to arrive.

We had signed up as participants in an "Upgraded dinner workshop" that allegedly should "take food to the next level with the latest biohacking cooking techniques and kitchen chemistry". Under the guidance of wild food chef Sami Tallberg, biohacking guru Teemu Arina and biologist Jaakko Halmetoja, six teams should prepare six courses during five hours. While waiting for the workshop to start, we could not fail to notice that the whole event was framed by a clear aesthetic ambition that ran through all the way from chef Tallberg's tai chi-movements, the way the kitchen and ingredients were staged to how the event was documented and shared on social media by the organisers'

own crew of photographers and marketers. These aesthetic dimensions and the framing of the workshop are further illustrated by the following excerpts from our field notes:

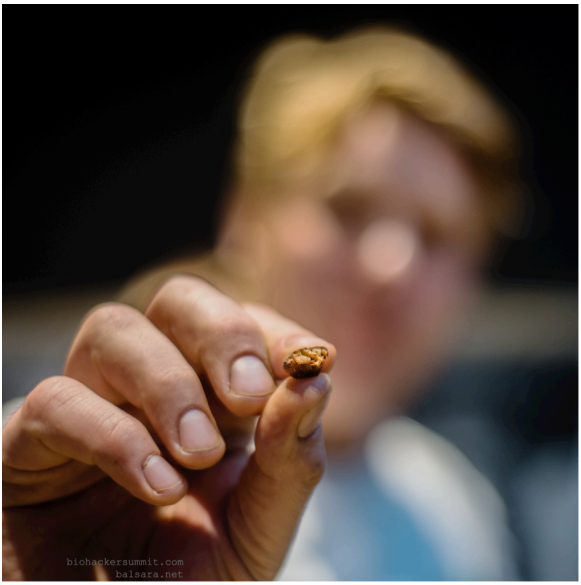
> Upon entering the upgraded food lab at the Flavour Studio, we were greeted welcome and equipped with aprons. Plates of wild game and local forage, mushroom bitters, freshly picked nettles, polypody roots, wild reishi mushrooms, and rhodiola roses were neatly placed on the tables. The carefully prepared mise en place with sharp knives, stylishly stuck in cutting boards, clearly signalled the involvement of a professional chef and the setting reminded us of the Master chef television series.

The kitchen and the arrangement of ingredients and utensils, where the familiar was mixed with the unfamiliar and perhaps even exotic or advanced, clearly provided a setting in which the organisers could not only share their expertise but also to do so in a manner that signalled a move beyond the mundane everyday practice of cooking. The first encounter with the workshop is further described in the field notes:

> After a short introduction, we were guided through the upgraded menu and were told that some of the ingredients had been collected in the dark Finnish woods during the day and that one of the instructors had had the opportunity to practice yoga while collecting the mushrooms and herbs. We were supposed to prepare dishes and drinks such as ”Rhodiola birch sap with blueberries”, ”Raw wild salad with kelp and sea buckthorn”, ”Wild mushrooms with herbs and liquorice”, ”Pike with nettle” and ”Raw white criollo chocolate infused with wild mushrooms and herbs”.

The upgraded dinner and the kitchen setting were visually documented on Flickr, thus adding a digital layer to the workshop. In the Flickr feed (see picture 2) the ingredients were depicted on their own, thus allowing for their unique mystery to unfold with an aesthetic that focuses on details of the objects

rather than the people handling them.[25] The photos depicting herbs, vegetables and fish as ingredients often shade out or blur the people involved in a way that emphasises the importance of the object as such and its inherent qualities. Instead of highlighting the practice involving the ingredients, the herbs, roots, spices and leaves, that form the basis for an upgraded meal, are presented with great detail and intense colours, as if every little detail on the leaves and stems and skin were important and somehow saying something to us. Through such a framing of the ingredients as isolated objects, they appear to possess a particular magic and certain characteristics to be revealed once one knows how to master them.



Picture 2. Sami Tallberg demonstrating an ingredient. Photo: Biohacker Summit (reproduced with permission from Teemu Arina).

25 https://www.flickr.com/photos/130008641@N05/albums/72157659657456296 (accessed 2016-11-30)

The chef, the scientist, and the alchemist

As the event unfolded, every dish was carefully and systematically presented by the organisers Tallberg, Arina and Halmetoja. Some of the produce were reasonably well known whereas others, mostly the ones being freshly picked in the Finnish forests, felt rather exotic. The presentation of the ingredients often went beyond what was assumed to be known, and the biochemical characteristics of various vegetables, roots, herbs and berries were explained. Some vegetables were said to bind certain toxins, others had particular hormonal effects and so forth. The three organisers had different roles in presenting the dishes that were supposed to be prepared at each table. While Tallberg focused on the preparation techniques and the visual composition of the meal, Halmetoja was more concerned with the medicinal qualities of the meals. In addition to these presentations and interpretations of the dish composition, Arina engaged in what could best be understood as an alchemist divination through which the seemingly unknown relationships between ingredients and their biomolecular qualities were revealed and interpreted. However, the roles were not statically distributed between the three organisers; the different perspectives on the food moved in and out through the conversations between them, and between them and the participants. The example below shows the interplay between these three roles and their different perspectives, and it is taken from a moment when the organisers were describing how to prepare one of the salads on the menu. Tallberg reached for one of the vegetables on the table and explained what it was to the audience:

> So what we have here is curly kale, so it's gonna… we're gonna take it of the stems, and if you prefer you can crush a little bit by hand… to soften up the texture a little bit… we put it there [he puts the kale back in the plastic box]… then we have we have Finnish apples [he takes one of the yellow red apples from the cutting board, and holds it in his hand]… just give them a little wash, and [he grabs the slicer] thinly slice them and they will go

> into the salad as well, we don't need to do anything for them except take this stem off…

When explaining that the apples could go into the salad without removing the seeds, Arina was quick to add that "a little bit of cyanide is good for everyone" and continued to explain that the pike that we were preparing is on top of the food chain:

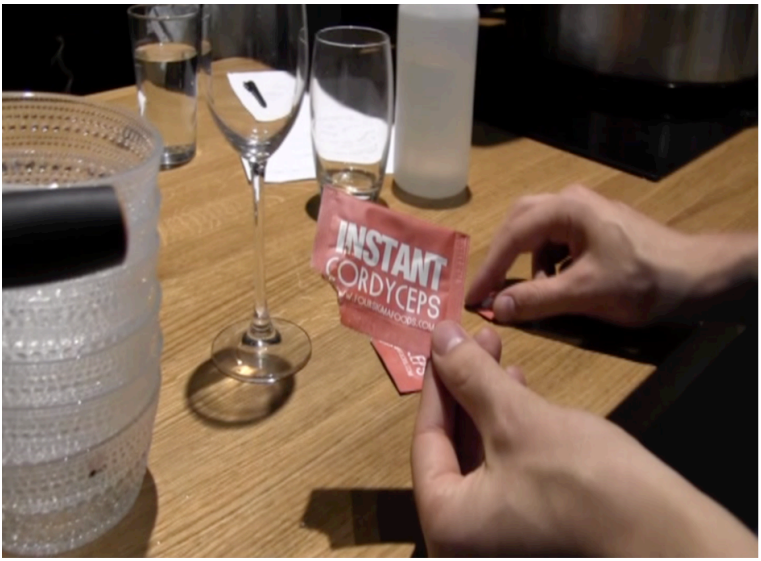
> And because they eat other fish, they will accumulate things like heavy metals and so on, so that's why we have kale and other seaweeds here… to bind some of those toxins, so that they don't get absorbed. Anyway, eeh, you shouldn't eat this type of fish for… too often… that should already take care of the problem, but if you wanna, you know, bind those things before they get absorbed, here's one trick to have a little starter to go with, a little bit of seaweed.

Picture 3. Mise en place. Photo: Vaike Fors and Martin Berg.

After this presentation Arina handed over the microphone to Halmetoja with the question "okey, what about the nutritional qualities… we're having it raw, and what's the benefit of having kale raw?" He continued explaining how the ingredients of the dish can possibly interact with the human body:

> Well, all the cruciferous vegetables, they have certain compounds, like sulphuric compounds, that get broken down when you cook them, and I think that's good in many ways, but sometimes it's
>
> good also to eat them raw to get, I would say, hormonal effects, especially for women. There are compounds that are really good getting rid of these bad forms of oestrogen for example, for men they're good for cancer prevention and stuff like that. But the other thing is that, I think seaweeds are excellent mineral sources and especially trace minerals…

The idea that natural ingredients possess certain qualities and a possibility to instantly change bodily processes became visible at several occasions during the workshop. Most notably at two occasions when the organisers engaged in practices that had elements of alchemist thought.



Picture 4. One of the organisers demonstrates a sachet of instant cordyceps. Photo: Vaike Fors and Martin Berg.

During the event, we noticed that Halmetoja was standing by himself and pouring something down his throat. We quickly moved towards him and noticed he was holding a sachet of ”Instant cordyceps”. We asked what he was ”trying” and he explained that it was ”a medicinal mushroom that is very good for your lungs”. He said that he had felt ”some type of mould or something in the air” and said that it had helped him before. We started to talk about these mushrooms and we were told that they are ”very good for your meridians and lungs and stuff like that” and he explained this further with references to both Chinese and Western medicine. Our conversation moved on to the event as such and we asked what it means to upgrade a dinner like this, what we need to do and if we need certain kinds of knowledge and techniques. He suddenly started to laugh and then said, ”most of the people think I need this or that, not that I can or I’m able to have, I think it is more kind of a point of gratitude that you understand how abundant the world around you is”. He explained this further and often returned to the notion of experience. He suggested that we all have an opportunity to optimise our experiences, and ourselves and explained that he had experienced an "overwhelming feeling of wellbeing over the years”. Furthermore, he suggested that “through these kinds of practices we are moving towards better feelings, more fun, more complex flavours and experiences, it is simply a question of changing what we value and to see what the world has to offer”.

The idea of unleashing the hidden powers of the nature in a nearly alchemist manner was evident not only in this example but also at another occasion during the event. By the end of the workshop, we encountered Arina standing by a table on which various roots, mushrooms and herbs were placed. In his hand he held a small bottle and with a movement that seemed to involve his whole body, as if he wanted everyone to notice what was going on, he used a pipette to drop some homemade Rhodiola extract on his tongue. When the drops hit their target his eyes opened up as if he were surprised and he seemed both content and satisfied by the fluids that had just entered his body. The way he used the pipette and the satisfactory facial expression the

drops caused, could be read as if he was more or less surprised or even amazed by his own alchemist skills.

The magic craft of biohacking cooking

When the actual cooking proceeded, we were organised into groups around different tables with all the ingredients in front of us, and the only guidance we had was the presentations held earlier (see above). The participants were everything from guests with VIP-tickets to the Biohacker Summit, to people who had bought the tickets because of their interest in healthy food. By moving through the different groups we soon realised that in every group there were at least two or more people with a lot of experience from cooking and with a great interest in and knowledge of the different ingredients on the tables (even the more obscure ones). In spite of this collective competence, everything took a lot of time, the whole cooking session lasted around six hours. This was due to the fact that even the simplest cooking manoeuvre around the tables was regarded by the participants as so complex and complicated that it needed to be supervised by one of the organisers or their helpers. The following example comes from one table where the group was going to prepare a salad with chanterelles and green leaves:

> After a short presentation round we looked at the ingredients that we were going to put together for the chanterelle salad. There was a box of chanterelles and a box of green salad leaves, and some herbs and bottles with different powders. Nobody moved for a long time and then I asked if we should get started with the chanterelles. There were a couple of comments around chanterelles and mushrooms in general, it seemed like the most of us had experiences of hunting, cooking and eating mushrooms. In spite of that everybody seem to be reluctant to start preparing the mushrooms as if there was something special about these ones. I asked: Should we start with cleaning them? A man who stood beside me shrugged his shoulders and asked: Are we meant to do that? Wasn't there something in the instructions about the dangers with spoiling the powers of the mushrooms [the last words he said

> with a specific and ironic voice, indicating that this was something almost supernatural]? Nobody said anything and then one woman ran off and came back with the chef to sort this question out. And yes, we were supposed to clean the mushrooms with one of those
>
> small mushroom brushes you can get at the grocery, nothing more, nothing less. The next step was to cut them in smaller pieces. We went through the same procedure, nobody dared to simply do this in the way they were used to, instead we had to wait until one of the chefs arrived to give his blessing.

There seems to be a rather complex relationship between expertise and exploration in the framing of the cooking workshop. On the one hand, the organisers engage in certain kinds of explanatory practices through which they uncover seemingly hidden affordances of the ingredients on the tables and explain the apparent mysteries of them being combined in different ways. On the other hand, the participants were encouraged to experiment and try out new combinations, for instance by adding unexpected ingredients to dishes. However, these unexpected ingredients were framed in a way that made it appear to be part of both tradition and myth, a mix that gave the adding of these ingredients into the food a feeling of joining both a traditional and cultural practice as well as a mystic and mythic one. This tension between mystery and mastery is apparent in the words of one the organisers who explained that upgraded cooking and living is partly about exploring and experiencing and partly about unveiling and understanding qualities of food that are often forgotten or unknown in contemporary society.

These are all examples of practices through which design processes take place, through which certain futures are desired and sometimes created. The biohackers use various ingredients and cooking techniques as a means to alter the human body at a molecular level. As we have seen, these future-making design practices are played out on different levels, both as a particular aesthetics with mysterious dimensions being added to ingredients, and as the interplay between professional roles through which the same mysterious dimensions are unpacked and interpreted. In

the examples above, cooking becomes a metaphor for control and enhancement while being used as a means to intervene in bodily biological processes. By claiming control over bodily processes this way, the seemingly automatic dimensions of metabolism are thought of as partly comprehensible and partly controllable. Through the use of esoteric and hitherto forgotten "knowledge" about how ingredients work together and what nature provides, it is assumed that the body can not only be altered but also enhanced.

Between mastery and mystery: The noble art of biohacking

Transhumanist discourse is usually technological, particularly cybernetic, even at the upgraded cooking event. It is by virtue of being construed as "information" that bodies and minds can be controlled, hacked, programmed, and upgraded. Food therefore should be construed as a code which enables such hacking and programming. However, this does not seem adequate to fully explain the experience of the transhumanist kitchen. The futuristic setting of the event is indeed a mise en scène of that technological discourse; but the actual practice of "hacking" the body with what can be made of fruits, berries, vegetables, herbs and mushrooms from the forest, displayed in the culinary mise en place, suggests a more lo-tech, down-to-earth approach to a biochemical understanding of physical and psychical transformation.

Of course, foodstuffs have long been tools for modifying the constitution, functions, affections and perceptions of the body, stimulating improvements in metabolism, sexual vigour, sensorial experience and so on. What is particularly alchemical in this transhumanist cooking is its reliance on the transmutation of natural substances for the physical, spiritual and moral transformation of a person. There seems to be an almost mystical urge to uncover hidden properties, to explore effects of mixing or otherwise manipulating ingredients, for the purpose of creating

new capabilities, affects, sensations and ways of being, for the individual as well as for mankind.

The mastery/mystery duality at work in the transhumanist kitchen gives ample evidence of this. While the biohacker, sometimes with great show, masters the natural resources as well as his/her own body, there remains an enigmatic, almost magical quality to the performance of alteration and self-transformation in that very mastering of matter. This sense of mastering nature does not inhere in the tendency to dominate, domesticate, control and exploit the natural world, which is often criticised as the anthropocentrism of modern humanism. This is one respect in which transhumanism does not accord with Enlightenment rationalism and technophilia. On the contrary, the natural produce is put into focus, its natural qualities, even as "raw food," are emphasised, and the aspect of "mastering" resides in an initiated knowledge of their chemical properties and the outcome of their combination and preparation. It is evident that the organisers are the masters of "the noble art" of such a transformation and we participants are mere apprentices in learning to extract the natural magic of mushrooms, nettles, kale, kelp etc.

This alchemical attitude bridges the gap between nature and technology usually associated with transhumanism and biohacking. Far from a prospect of deep-frozen corpses and uploaded minds, this transhumanist kitchen is a laboratory for turning the secrets of nature into a life-affirming, savoury feast. The futuristic aesthetics and rhetorics of the biohacking event are thereby balanced by an appeal to age-old desires and ideas of their effectuation, the lofty ideals of transhumanism grounded in the earthiness of vegetables and minerals. Indeed, prominent transhumanists are clearly aware that they are situated at an end-point in a long line of cultural milestones marking the path towards longevity, through Gilgamesh, the Daoists, the alchemists and onwards.[26] In spite of its futuristic imaginings,

[26] Bostrom, 2005, p. 1.

transhumanism is somehow legitimised by its most ancient legacy – which in itself is a rather alchemical notion.

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