# Reimagining the Body in Post-Singularity Techno-Utopias

Teresa Botelho

Nova University of Lisbon/CETAPS

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> *Our version 1.0 biological bodies are (…) frail and subject to a myriad of failure modes, not to mention the cumbersome maintenance rituals they require. (…) The Singularity will allow us to transcend these limitations of our biological bodies and brains. We will gain power over our fates. Our mortality will be in our hands. We will be able to live as long as we want.(….) By the end of this century, the non-biological portion of our intelligence will be trillions of times more powerful than unaided human intelligence.* (Ray Kurzweil[1])

## "What was once called Natural Law"

The technological[2] imagination, invested in mythologies of ever increasing man-made progress, has shaped a vast corpus of visions of a better world, under the premise that human mastery over an adversarial sphere of the natural, led by reason and governed by ethics, would be instrumental to the improvement of mankind's condition. This utopian trend has its foundations in the early European writings of Campanella, Bacon and Condorcet[3] and continues throughout the nineteenth century in the proposals of Fourier and Owen[4] amongst others. It has used the tropes of scientific and technological progress as signifiers for desired social orders and happier futures available to those who share the knowledge required to control their environment; how far these imagined landscapes depend on the techno-scientific innovations envisaged or work them in tandem with other social and economic changes varies greatly, but as Segal points out, in countries like the United States, where the rhetoric of the "technological sublime" discussed by Perry Miller, Leo Marx and David Nye[5] always stood at the center of the national narrative, a great number of utopian works present a degree of reliance on applied scientific advancement that oftentimes supplants proposals of social rearrangements (Segal, 2005: 2). Many of these articulations of techno-utopianism do in fact equate progress with practical achievements brought about by advancing efficiency in production and in communication and transportation systems thought to establish new conditions that would improve humanity's choices in terms of work and lifestyle, freeing citizens not only from poverty, hard and repetitive labor, but also from major sources of

individual and collective unhappiness, from illness, crime, social disorder and urban dysfunction to war, thus enabling them to attain emotional and psychological harmony.

Significantly, most of these American nineteenth and early twentieth century texts present themselves not as distant visions of dreamy better futures that may happen in some unpredicted time and place, but as grounded and attainable rationally driven tomorrows that are not, "unscientific, out of touch with reality" utopias "in the clouds"[6], as Charles Williams Wooldridge would explain in the preface to his 1902 *Perfecting the World*: *A Piece of Possible History*, but extrapolations which remain "true to the laws of cause and effect, and duly regarding the limitations of nature" (Wooldridge, 1902/1971:11). This is the case not only of Edward Bellamy's influential *Looking Backward* (1888) and its sequel *Equality* (1897), but of the twenty-five technological utopias identified by Segal, produced in the fifty years that separate John Macnie's *The Diothas: Or, For a Look Ahead*[7], published in 1883, and Harold Loeb's *Life in a Technocracy: What It Might be Like*[8] from 1933. Early feminist utopias, even if still shaped as hybrid texts which invoke the tropes of fantasy, also commonly associate scientific and technological advances with social and political emancipation. This is the case of *Mizora: A Prophecy*, first published in installments between 1880 and 1881 by Mary L. Bradley Lane. Considered the first depiction of a single-sex self-sufficient utopia and preceding Charlotte Perkins Gilman's better known *Herland* by three decades, *Mizora* describes a society where applied science is central to its collective identity construction[9] investing, as Christine Mahady points out, in "the utopian potential in reconceptualizing human relationships with nature" (Mahady, 2004:94). Claiming to be "a people who have passed beyond the boundary of what was once called Natural Law" (90), the Mizorans have developed the capacity to manipulate nature, namely producing artificial food and provoking rain by means of electrical charges, and have acquired the specialized knowledge that enables them to use the parthenogenesis reproductive techniques that make their survival possible.

If imagining these radical manipulations of the body would seem, in the late nineteenth century, an improbable transcendence of the limitations of nature, in the early twenty-first century, ideas about the announced obsolescence of what singularity theorist Ray Kurzweil calls our "1.0 biological bodies", on the threshold of a different type of transcendence generated by enhancement and fusion with non-biological components, have become part of the cultural conversation signaling, as Joel Dinnerstein remarks, that "the Enlightenment utopia of the mind – as the rational host of self-control, self mastery and perfectibility – has shifted to the body" (Dinnerstein, 2006:573-574). Unlike the techno-utopias of one hundred years ago, which centered on the control of the environment and could assert themselves as grounded in logical possibility because the near future they projected seemed knowable and predictable, contemporary imaginings of what is to come are more troubled by uncertainty, "entranced" as the editors of *Science Fiction Studies* suggest, "between the prospect of a technological transcendence that will make the future mute and inaccessible"

and a collapse of the future into the present, that is, between the unknowns beyond a predicted Singularity Horizon and the constant and accelerated presentification of what not so long ago could only be described as pertaining to the realm of fiction (Editors, 2006:338).

## The Utopia called Singularity

Singularity Theory, the dominant topos of transcendent progress that has been described as the "quintessential myth of contemporary techno culture" (Csicsery-Ronay, 2008:262), as it was first articulated by mathematician Vernor Vinge in a foundational paper delivered to NASA in 1993, predicts an increased acceleration[10] of technological progress that will culminate in the "imminent creation of entities with greater than human intelligence" effecting a change of such magnitude and unpredictability that can only be compared "to the rise of human life on earth" (Vinge, 1993). This paradigm shift caused by the exponential growth of genetic engineering capacity, nanotechnology and robotics (the trilogy of agents of radical change commonly known by the acronym NGR) will change our understanding of what it means to be human and our relation with time and space in ways we are not yet equipped to imagine. The core of this formulation, which has dominated the discourses of science fiction for the last three decades, has travelled outside the fictional domain becoming, as Raulerson argues, "the object of a larger cultural interrogation" and a "potent signifier for the present historical moment" (Raulerson, 2013:4-5). It has been taken seriously by policymakers, companies and academics, who coalesced, for example, in the creation of the Singularity University, whose declared purpose is "to help individuals, businesses, institutions, investors, NGOs and governments understand cutting-edge technologies, and how to utilize these technologies to positively impact billions of people."[11]

Interpretations of the outcomes of Singularity vary significantly in reach and tone: while sharing a prediction of an incremental acceleration of knowledge, they differ both in terms of the pace of that process and of the legibility of the future beyond that Event horizon. Vinge's warning against the possibility of predictable extrapolation, a "not knowing" which in his fiction seems to translate as a quasi-deterministic rush towards an ambiguous and not so happy future for humanity[12], is not shared by all futurists, especially by the most influential and optimistic of the Singularity theorists, Ray Kurzweil, the author and computer scientist who is presently director of engineering at Google. Both in *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* (1999) and in *The Singularity Is Near: When Humans Transcend Biology* (2005), Kurzweil argues that the principle of accelerating change, caused by an incremental, exponential and linear technological innovation that feeds on itself and therefore accelerates ever faster, will bring about not only a future which is near and predictable, but one which will be remarkably better for humans. This utopian optimism, not

so different in its enthusiastic overtones from that which shaped the techno-utopias of the past, is grounded on a cluster of "interlinked and overlapping topoi" which Raulerson has grouped into three major categories – "the material, the political-economical and the eschatological" (*idem*, 37). These pertain more specifically to three main utopian mythologies of the singularity discourse: the posthuman future of the body, the reconfiguration of the social and material structures of society, brought about by post-scarcity economics[13] and by adhocracy[14] organizational models, and the belief that what is to come is so radically different from what we know that the transformation is akin to the refoundation of human history. Of these prefigurations, the future of the human body has developed a particular hold on the contemporary imagination, captivated by the consequences of the transcendence of the organic–machine divide. According to the predictions of posthumanist theory, the path towards the fusion of organic with inorganic will proceed along a number of stages starting with the transhumant phase where human bodies will become gradually more synthetic and "life will be prolonged and enhanced through cyborgization – body-improving prosthetic technology that will replace deteriorated body parts" (Dinello, 2005:19), and ending in the posthuman condition where, as Katherine Hayles describes, our "coupling with intelligent machines" will be "so intense and multifaceted" that it will no longer be possible to distinguish "between the biological organism and the informational circuits in which the organism is enmeshed" (Hayles, 1999:35). In parallel with the trope of the emergence of sentient machines, "who will appear to have free will" and "spiritual experiences" (Kurzweil 1999:6), these imaginings are fed by a constant flow of information that instantiates the collapse of the future into the present identified by the editors of *Science Fiction Studies*; we may not yet be on the verge of transcending the limitations of our biological "1.0" bodies and "wetware" brains but current advanced medical research has already produced robotic exoskeletons which, responding to signals sent from a wearer's brain, enable those who have lost the use of their legs to walk again[15], bio 3D printers are expected to be in general use to print skin, bones and joints in the very near future[16], and the Blue Brain Project in Lausanne is building a fully functional simulated brain in a supercomputer, tasked with digitally recreating all the behavioral structures of a biological brain. This will provide unprecedented opportunities to study the fundamental nature of cognition, fundamental for research in neuroscience, even if one dismisses as naïve some of the utopian overreach of the project described by its director as a useful tool for solving human conflicts: "If the planet understood how the brain functions," Dr. Henry Markram muses, "we would resolve conflicts everywhere. Because people would understand how trivial and how deterministic and how controlled conflicts and reactions and misunderstandings are" (*apud* Kushner, 2010).

At the same time, only thirty years after Haraway's *Cyborg Manifesto*. human enhancement technologies already allow a number of individuals to claim Cyborg status. This is the case of Neil Harbisson, the founder of the Cyborg Foundation based in Barcelona, and performance artist Stelarc. While Stelarc had a cell-cultivated ear surgically attached to his

left arm and has performed with a mechanical human-like third hand under the motto *The Body is Obsolete*, Harbisson, who describes himself as fully transhumant and is biologically color blind, has an eyeborg implanted inside his skull; this antenna, connected to a chip, allows him to perceive colors translated into sounds and to access the internet and receive phone calls directly into his brain via an external device. "I don't feel like I'm using technology, or wearing technology," he explains. "I feel like I am technology. I don't think of my antenna as a device – it's a body part" (*apud* Jeffries, 2014).

But if it is true that the future is becoming the present at a quicker pace than ever before, it is in science fiction that the topoi of the Technological Singularity have emerged as an irresistible magnet for a debate that is as much about the future as it is about the present. The vast corpus of recent filmic, televisual and literary post-singularity narratives that have explored the interrogations and anxieties of the announced transcendence of the natural body have, to a great extent, interpreted its most commonly predicted tropes – the transhuman and the posthuman - either through the techno-optimist validation of disembodied consciences (in contrast with the ambiguous noir aesthetics of *Cyberpunk*), through the anti-technological visions of what Daniel H. Wilson has called *Robopocalipses* (Wilson, 2012), or through an exploration of the ever frailer borders between humans and sentient artificial entities.

Following the speculations of Margey Piercey's *He, She and It* where the protagonist assures Yod, her android lover, that his artificial sentient self is just "a purer form of what we're all tending to" as "we are all unnatural now", "all cyborgs", (Piercey, 1991:150), recent post-cyberpunk science fiction narratives directly engaged with the Singularity Hypothesis have been particularly concerned with the subjectivity of these new identities, scrutinizing the construction of selfhood of both technologically mediated humans and non-human sentient entities. This remainder of this paper discusses two science fiction novels shaped by this new vision of the human - Charles Stross's novel *Glasshouse* (2005) and Cory Doctorow's *Down and Out in the Magic Kingdom* (2003) - examining in particular the visions of the relationship between body and mind they foreground, and the role of disembodiment and embodiment in the creation of stable selves in the enhanced humans they imagine.

## Bodies that do not Matter

Cyberpunk may have been responsible for the introduction of a rhetoric of technology which, embracing the Cartesian duality between body and mind, construed consciousness as independent from the limiting restrictions of the "meat machines" that enclose it. For Cyberpunk's techno-cowboys like Neuromancer's Case, who "lived for the bodiless exultation of cyberspace", addicted to the projection of disembodied consciousness into the "consensual hallucination that was the matrix", a "certain relaxed contempt for the flesh"

(Gibson,1984:12) did not come hand in hand with utopian visions of better post-body worlds, but with dark and cynical landscapes of futures dominated by corporations run amok, where body and mind enhancements do not operate to liberate the self from the panopticon quality of the social environment, aligning the subgenre, as Tom Moylan suggests, with the classical dystopian tradition of Zamyatin, Huxley and Orwell (Moylan, 2010:84)

In contrast, post-singularity fiction, especially that of Charles Stross, concerned not so much with the "brain in the vault" trope as with the modes of conceiving the self without stable bodily groundings, has deliberately engaged with the utopian possibilities of the technology that liberates the body from its biological destiny, also pondering at some length on some of its economic, social and political consequences. In parallel, awareness of a debt to cyberpunk clearly shapes its visible counter-narrative strategies, choosing to move away from the nihilistic, male-centered and emotionally autistic character constructions to play with gender, identity pluralism and subjectivity.

The perceived utopian naivety of Stross's enthusiasm for post-singularity possibilities has been scrutinized by critics, suspicious of its embrace of a kind of acritical techno-utopian telos. Steven Shaviro, for example, finds Stross's work lacking a modicum of "existential anguish", creating naively optimistic post-human vistas as if "cyberpunk had never happened" (Shaviro, 2009:109).

This may very well be the case of *Accelerando* (2005) the novel Shaviro discusses. Here Stross maps out a through-the-singularity vertiginous journey which begins in Amsterdam in 2010 and ends sometime in an after-Earth multiverse in the twenty-third century, following the creation of a post-scarcity society where goods are available to all, assembled by combinations of artificial intelligence and nanotechnology (an extrapolation from Eric Drexler's thesis in *Engines of Creation*), where mind-uploading and body reassembling have become the norm, where the Reversibility, the process by which one can back oneself up, pick different life courses and choose which works best, has been discovered and is widely practiced, where the creation of group-minds and distributed intelligence and the possibility of multiple simulated concurrent existences are no longer new, all in a vortex of deconstructions of the now that mirror directly the most outlandish premises of Singularity Theory.

In contrast, the different narrative strategy of *Glasshouse* (2006), which takes the time sweep of *Accelerando* further into the future to the twenty-seventh century, allows for a more intimate and nuanced examination of the challenges of living in the posthuman condition. While the material conditions of a post-scarcity economy are very similar to those described in the previous novel (abundance of goods and services for all generated by nano-production), and a landscape of political instability that emerged from a previous war between Polities is sketched, *Glasshouse* concentrates on a first person narrator and on his subjective experiences, invoking, as Sarah Herbe suggests, a "pseudo-autobiographical mode" that

provides “ample insight into how it feels to live several lives” and to be autonomous from one specific body and life cycle. (Herbe, 2011: 223)

The narrator is Robin, whom we first encounter inhabiting a male orthohuman body recovering from a procedure of identity reindexing, which included a major memory excision; his body had also been edited as he had taken the opportunity to have his age reset, choosing a post-adolescent body-plan, a rejuvenating cycle he had undergone many times before in his 70 years. What Robin remembers, how reliable these memories are, what he has lost and why, are at the core of his search for knowledge that is also a search for selfhood. Dispersed “shards of memory remain”; he remembers having once been an academic, a historian. Crucially, he tells himself, his sense of identity was configured around the key idea that “I wasn’t solitary” (203); there had been a loving stable family relationship with three other core partners (two human and a xenomorph) and two children, whom he remembers as having died in the Censorship Wars. He also hypothesizes that his “radical rebuild” was not the result of a need to “refresh himself” as he tells Kay, whom he first meets in the same rehab facility as a woman in a xenohuman body (she has had a body transfer, as she last inhabited a primitive non-human alien identity), but rather the result of “knowing too much”(3), although he can no longer recall what that dangerous information was. He is convinced that the memory excision was done under duress, that “someone had made him an offer he couldn’t refuse – either to consent to memory surgery or his next death would be the last” (4). At least that is what his former self wrote in a letter to his future instantiation before a part of his memory had been destroyed.

The threat of having one final death from which he would not return has to be understood in the context of a society where involuntary total erasure is postponed indefinitely thanks to the existence of assembler gates which use nanotechnology to reconstruct bodies if they are ill or hurt, and to the practice of having a regular backup of one’s present instantiation so that a temporary death can be reversed as a dead body can be reassembled and given the stored mind back-up.

Hesitant about what to do next with their new bodies, both Robin and Kay decide to participate in an archeological experiment that is designed to simulate the pre-singularity “dark ages”, recreating life in the early twenty-first century, as the records of that primitive time have been lost. The participants will be assigned new non-modifiable bodies and live with the limited economic and technological resources of a recreated twenty-first century suburban community panopticon, where their behavior will be observed and recorded. In preparation for the experiment, Robin emerges backed up as a female, a body-plan he recollects having used sometime before. As part of the simulation he/she is given a husband, a suburban house to live in, a dark ages job as a librarian, all under the gaze of a system of social monitorization directed by the experiment organizers.

Using a narrative strategy that creates distance and estrangement between what is recreated as a past that readers recognize as their present, and the post-singularity present that shapes the gaze of the observer describing that past, the text always informs by contrast. So, when as a pre-singularity human in a female body Robin, now Reeve, encounters with shock and horror the indignities of the biological body he is now forced to inhabit, especially fertility, an idea that turns his/her "world view (…) upside down and whacked down with a hammer", a fresh gaze at other possibilities is narratively suggested. When the realization that "the orthohuman bodies they put us in are so ortho that we could generate random human beings if we have sex" (142) terrifies Reeve and her temporary husband, at least as much as the realization of the limitations of biologically based medicine where being ill implies coping with dark ages tech – no disassembling and rebuilding people, no self-replicating organisms, no medical assembler, just "medicine, drugs and surgery" (276) - the utopian qualities of the technologically superior future would seem to be vindicated.

As the real facts of the twenty-seventh century world that filter through the memories of the protagonist paint a scenario of generalized abundance and health that is nevertheless shadowed by conflict and totalitarian threats, that superiority gains an ambiguity that the rest of the text deliberately cultivates.

These tensions are made visible to Robin only gradually, as bits of the autobiographical memory contained in the pre-excision letter he wrote to himself return in the form of dreams. But not knowing if what he remembers is true or if his memory has been hacked renders all this self-awareness unstable; as he asks himself "Did I lie when I was writing it? Did that other me tell the truth or was he spinning a pretty tapestry of lies for the stranger he was to become in the future?" (91) He remembers, for example, the war that disabled the reassembling facilities and permanently killed his family, and even recalls having temporarily been the non-biological nervous system of a combat weapon, believing for a while that war crimes he does not remember committing may have caused his need for radical identity reindexing.

The final realization that memory excision had been part of a coordinated opposition plan, for which he had volunteered, that intended to infiltrate and sabotage the "dark ages" reconstruction experiment, which was in fact part of a rogue authoritarian attempt to breed a new accommodating population for a future cognitive dictatorship, allows the memories of Robin's several lives as a male or female human and as a mechanical entity to consolidate into a recognizable map of disembodied selfhood, detached and independent from the many human and non-human bodies it had inhabited.

More significantly, this consciousness is anchored in emotional memory and permanent qualities – love for a lost family, dedication to a professional calling, devotion to principles, loyalty to an aim that demands self-sacrifice - vindicating the thesis of the autonomy of the mind as the site for selfhood construction, irrespective of the technologically generated bodies it may inhabit.

Cory Doctorow's *Down and Out in the Magic Kingdom* (2003) takes the reader to a twenty-second century Earth dominated by the Bitchun Society, the guarantor of the utopian order which promotes the end of scarcity to the few "off-world" mountain dwellers who still resist Free Energy and the end of death; the basic material conditions are similar to those described by Stross (no poverty, no necessary work, no sickness and no death thanks to nano-production, mind-uploading and body cloning) but some satirical *nova* introduce a critical gaze at the blissful utopian future imagined, which is already placed on the verge of satire by the incongruous location chosen for the central action - a Disney World ruled as an adhocracy where different groups struggle for simulacra of power.

One of these *nova* imagines a radically new economic order, based not on money and the value of material objects, which would make sense when traditional work is no longer necessary and people live for as long as they choose, but on prestige and individual reputation. The new currency, Whuffie points, are attributed to each individual according to their creativity and socially useful endeavors. The points are instantly known to everybody with whom they interact, as one's scores are accessed via the networked brain implants all citizens of the Bitchun society have, thus introducing a new type of social hierarchy based on a "likeability" status that, as Doctorow confirms, "punishes minority opinions instead of protecting them" (*apud* Fletcher 2010:91) in a society that defines itself by its equality of access to prosperity.

The second *novum*, the practice of deadheading, is used as an antidote to the flipside of the end of death and eternal happiness, namely boredom. Better described as a temporary death from which one may reemerge anytime one chooses, as one leaves one's conscience backed up ready to unload into a fresh body, the practice is recommended to those who feel they have seen all there is to see, done all there is to do and secretly wish for permanent death. Keep A-Movin' Dan, a Bitchun missionary to the off-worlders finds himself in such a quandary. Deadheading, which the narrator recommends suggesting "why not just deadhead for a few centuries, see if there's anything that takes your fancy and if not, back to sleep for a few more?", does not seem as attractive for someone "thinking the old way" as just ending: "You really think," he asks, "there is going to be anything recognizably human in a hundred centuries? Me, I´m not interested in being a post-person. I´m going to wake up one day and I´m going to say, 'Well, I've had seen about enough' and that will be my last day" (13).

The ironic distancing from the utopian promises of what Kurzweil called "control over our mortality" is maintained when the text revisits the disembodied mind trope in new ways, introducing a degree of instability in the process of body reassignment and mind uploading that was seen as whole and certain in *Glasshouse*, all things being equal. When early in the novel Julian, the narrator, is murdered, a futile exercise of violence inexplicable because of its reversibility, his backed-up mind, used to restore him to life, naturally lacks the memory of the murder and this, by itself, introduces a paradox in his continued sense of self. This is

further interrogated when the sameness of his copy is called into question, namely by his old friend Dan, who clings to the belief that "there is a difference between you and an exact copy of you", and that "being destroyed and recreated" cannot possibly be the same as "not being destroyed at all", in the same way as the "quantum mechanics" that destroy and recreate us "a trillion times a second" cannot be equated with the process of becoming "a clone with a copied brain" (41-42). Although Julian lightly dismisses his friend´s ontological doubts, stressing that he feels like himself, the narrative arc of the story shows that that is not exactly the case and that between his old self and the new there are significant changes, namely in the perception and critical evaluation of the goodness of the world that he had never previously questioned.

Even considering, as Fletcher concludes, that *Down and Out in the Magic Kingdom* enacts a "complex ironized view of the costs and benefits involved in technological change" (*ibid*, 92) that distances itself from the rosy posthuman futures predicted by Singularity theory, the belief, as Doctorow asserts, that we will become "not less human but different kinds of human" (*apud* Fletcher, 2010:92-93) is maintained at its core, along with the utopian possibilities of transcending the organic limitations of the body by conceiving it as a replaceable, separate encasing for the mind.

Other alternative science fiction visions have centered not on humans wanting to transcend their limited "meat-bodies" but on sentient machines reaching for personhood by creating for themselves those same cumbersome flesh bodies for which cyberpunk has such "relaxed contempt" and which Stross's and Doctorow's futures did so much to render irrelevant, editable, interchangeable or easily reassembled, or on humans facing the challenges of the future from the fragility of their decaying 1.0 organic instantiations (as is respectively the case of the much discussed television series *Battlestar Galactica* 2004-2009 and the film *Interstellar,* 2014); in both cases, an aesthetic nostalgia for pre-singularity assurances seems to point in the opposite direction, overturning the premises of the disembodied mind and the imperishable or eternally reduplicable or replaceable body.

Whether the contemporary techno-utopias grounded in Singularity Theory are compatible with the concept of the 'lived body' and with the perception that "as a material ensemble, the human body (...) our phenomenological, mortal perceiving human body is the only available *analogon* for thinking a certain complexity of thought,' (Lyotard, 1991:22) is perhaps irrelevant to the current debate over our posthuman futures. As readers of technological utopias one hundred years ago probably were, contemporary readers may well be aware that promises of redemption through applied science have their limitations, and that the more outlandish predictions of "the death of death" will probably have the same fate as the pathogeneses maternity of the 1880s Mizorans. They will most certainly be aware of how culturally rooted these predictions are, of how, as Dinnerstein asserts, they frequently function "as forms of social evasion", foregrounding deterministic futures that will happen regardless of

the efforts of the billions of humans grappling with urgent problems of survival in the here-and-now, and of how they tend to "recapitulate the Western tendency to universalize its own experience" (*idem,* 570-571), an effect that should be counterbalanced by contact with more ironic and skeptical narratives coming from authors who are not at the center of the techno-centric world that generates these visions[17]. But while pondering these many caveats that shadow the utopian promises of NGN mediated posthuman features, the questions identified by American philosopher Steve Fuller in a recently published study tellingly entitled *Humanity 2.0: What it Means to be Human Past, Present and Future*, remain relevant. Discussing the argument that "semi-siliconized cyborgs or outright computer androids might function equally well – if not more efficiently – as successor vehicles for the transmission and cultivation of what is distinctive about our being, whilst avoiding many if not all the liabilities of human biology", a position that relies on the popularity of a vision that "treats the possession of an animal body as only contingently related with our humanity" (Fuller, 2011:2), Fuller challenges us to consider "whether we would like to continue to anchor humanity in our carbon-based bodies" or whether we should "leverage humanity into more durable" and efficient "silicon-based containers" (*idem*, 3) or, in fact, whether there are not other more creative hybrid options open to us.

Technological science fiction utopias, as thought experiments where notions of the hypothetical and not only the possible may be acted out, offer a fertile ground for grappling with the transitional anxieties of the Singularity Theory, imagining future configurations of the human we may contemplate, scrutinize and ultimately find compelling or abhorrent. In *Accelerando*, Charles Stross claims, tongue in cheek, that the *Singularity* started its inexorable course "on June 6, 1969, at eleven hundred hours eastern time" when "the first network control protocol packets were sent from one data port of one IBM to another – the first ever internet connection" (191). Even if we do not accept that "since then we've all been living in a universe that was impossible to predict from events prior to that time" (*ibidem*), the future is already here, as it has always been, and through its fictions we can do what we have always done – consider the utopian or dystopian implications of our unending scientific and technological inventiveness and then make choices.

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## Notes

1 Kurzweil, Ray (2006), The Singularity is Near: When Humans Transcend Biology. London: Gerald Duckworth & Co. p.9

2 The term "technological" is used here to signify applied science, and not in the stricter sense of machines and hardware, bridging what Segal defines as the separation between "knowing how " and "knowing why" dominant until the early nineteenth century (Segal, 2005: 13)

3 See Tommaso Campanella (1623/ 1971) The City under the Sun in Peaceable Kingdoms: An Anthology of Utopian Writings. Ed. Robert L. Chianese. New York: Harcourt, Brace Jovanovitch, pp. 8-41; Francis Bacon (1627/1999) New Atlantis in Three Modern Utopias. Oxford: Oxford University Press pp: 149-186; Marquis de Condorcet (1795/1955) Sketch for a Historical Picture of the Progress of the Human Mind. New York: Noonday

4 See Charles Fourier (1971) The Utopian Vision of Charles Fourier: Selected Texts on Work, Love and Passionate Attraction. Ed. Johathan Beeker and Richard Bienvenue. Boston: Beacon Press; Robert Owen (1816/1970) A New View of Society and Report to the County of New Larnak ; Or,

Essays on the Formation of Human Character Preparatory to the Development of a Plan for Gradually Ameliorating the Condition of Mankind. Ed. A.C. Gatrell. Baltimore: Penguin Books

5 See Perry Miller (1965) The Life of the Mind in America. New York: Harcourt, Brace, Leo Marx, (1964/2000) The Maxine in the Garden: Technology and the Pastoral Ideal in America. Oxford: Oxford University Press and David Nye (1994) American Technological Sublime. Cambridge, Massachusetts: MIT Press.

6 Wooldridge includes all previous utopias in this category, including Bellamy's work.

7 In The Diothas, written under the pseudonym Ismar Thiusen, Macnie imagines a progressive and equalitarian society, predicting a number of inventions and advances that would become common in the twentieth and twenty-first centuries: international telephone networks, electric cars and the recording of classes by university lecturers. Perhaps better known is the prediction that roads of the future would have white lines dividing traffic lanes.

8 The thesis of the book, namely that technological advances could free humans from economic pressures and wage labour, opening new opportunities for leisure, spiritual well-being, aesthetic fulfillment and general happiness, invokes the principles of the Technocracy Movement that flourished in the United States and Canada in the early 1930s.

9 The text is shaped not only by a feminist perspective, but by a racially exclusive overtone, invoking, as Mahady suggests, myths of improvement "that require adherence to universal ideals and the suppression of differences that stand as obstacles to achieving visions of progress" (Mahady, 2004:93)

10 This acceleration extrapolates Moore's Law, which predicts the rate at which processors become faster and more powerful, roughly doubling their capacity every 18 months, to other domains namely nanotechnology and genetic engineering.

11 See Singularity University http://singularityu.org/ (retrieved 10 October 2014)

12 See in particular Marooned in Real Time (1986) published in the collection Across Real Time.

13 Post-scarcity economics is a speculative theoretical post-capitalism economic model in which goods and services are universally accessible due to advanced productive automated systems. Fictional post-scarcity societies emerge in utopian science fiction, namely in the novels discussed in this paper as well as in others, like the Ian M. Banks Culture series, and in dystopian texts such as Stanislaw Lem's Cyberiad.

14 "Adhocracy", a term first used by American futurist Alvin Toffler in the 1970s, designates a system of organization defined by the absence of formal structures, with no predetermined fixed roles, supposedly more appropriate to a world of swiftly advancing technology and of societal impatience with the multilayered authority structure of the typical bureaucracies.

15 See ScienceDaily (7 March 2013)
http://www.sciencedaily.com/releases/2013/03/130307110358.htm (retrieved 18 October 2014)

16 Wheeler, Andrew (2015) "Japanese Researchers Pursue Next Gen Bio-3D Printer for Skin, Bones, & Joints" (22 January) http://3dprintingindustry.com/2015/01/22/japanese-researchers-bio-3d-printer/ (retrieved 2 February 2015)
17 See, for example, Walter Mosley's Futurelands: Nine Stories of an Imminent Future (2001) or Nnedi Okorafor´s Who Fears Death, (2010) for different takes on the future.