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Decolonising the future

not to go where cyborgs have gone before?

Prologue

In 2008, during the third Internet Governance Forum (IGF) in Hyderabad (India), I participated in a *Futures* workshop. The IGF, like its predecessor, the World Summit on the Information Society (2003-2005), is a UN-sponsored *multi-stakeholder* undertaking; unique to multilateral consultations usually premised on strict accreditation and diplomatic protocol. IGF meetings bring together government, corporate, and civil society representatives engaged in decisions that make the Internet *tick*. The aim is to create a global consensus on the agenda-setting priorities for future Internet governance.[1]

Participants in this workshop were therefore a mixed bunch. In our group's case, something to do with being under siege, the discussion was primarily informed by personal backgrounds and current stakeholder affiliations. Further into the session, different *hats* worn by participants added another layer of complexity to the analysis; e.g. a feminist activist from Brazil with an engineering degree, an academic with a policy-advisor position from the US, a PhD researcher working with a community media NGO in India.

Despite this diversity and the relatively relaxed atmosphere, the discussion was limited. First by a certain reluctance to take time to fully consider the implications of divergent analyses of the situation. This inability to get past our respective *now-isms* and *this must be so-isms* along with age-based and gender differentials became more apparent as the time limit neared and dominant group-members from the Global North with chairing or policy-making experience took over. Second there was, to my mind, an unwillingness to project our thinking unreservedly into a future where anything is possible; an inability to play with the future as opposed to plan it or think of ways to colonise this unknown with the present. After all the aim of the exercise was less about outcomes. It was more about the process, an experiment in creative thinking, improvisation, getting past pre-givens into the imagined. That is the challenge of these sorts of simulations; realising the limits to your own imagination, being confronted by the inventiveness of others, and letting go of preconditioned mind-sets.

This recollection of the difficulty of future thinking in practice sets the scene for the reflections in this chapter.

Initial conundrums

Can those of us living in hi-tech, computer-dependent parts of the world imagine a future without the Internet? By that I mean everyday life without the means of 24/7 communications with family, friends and colleagues, access to information resources, professional or leisure-based products and services? Even those without full access, who use the web reluctantly or have unplugged

[1] The UN *Internet Governance Forum* is the successor to the *World Summit on the Information Society* which ended in Tunis, 2005. The IGF was set up to stimulate, though some might suggest it actually operates to *simulate* a "multi-stakeholder policy dialogue" on Internet governance issues; http://www.intgovforum.org/cms/. In 2011 it kicks off its second term in Nairobi, Kenya. The theme is "Internet as a catalyst for change: access, development, freedoms and innovation" (http://igf.or.ke/). The IGF is characterised by 1. the activities of civil society participants, from the floor and in the *Multistakeholder Advisory Group* (MAG), 2. the gradual incorporation of remote participation platforms and social media, more or less effectively, and 3. the strength and weakness of its purely advisory role (Franklin, 2007; Jørgenson, 2006).

themselves from the *global information infrastructure* that underpins the *disjunctures and differences* of the world today still have to work and live with the rest of us who take these facilities for granted.[2]

If any future society is indeed unimaginable without the operations of computer-mediated networks to connect people, goods, and services across time-zones and territorial spaces then what sorts of future relationships are we hoping to create by managing and channelling these various interconnections? And what about tomorrow's world for the rest of the planet? Will the "next billion" who have been promised Internet access as part of the United Nations Millennium Development Goals be able to decide for themselves the terms and conditions by which these facilities become part of their future? More specifically, is *interoperability*, a cornerstone of global computer-mediated communications as we know them, simply a technical problem to be solved, or is it primarily a social and political question around how to reconcile diverse and competing ways of life?

Whilst millions think they can't live without web-access many more millions can, and do. In fact 75% of the world's population live and work without high-speed Internet facilities or have to make do with hand-me-down computers and infrastructural components, still get most of their news and entertainment from television or printed news media. This three-quarters of the world, within and across this so-called Digital Divide comprises communities and societies where other, pre-digital understandings of what counts as information, knowledge, and communication prevail. They are also where the uptake of mobile telephony is outstripping fixed-line Internet-age telecommunications.

Whilst this is an anthropological observation, it puts into perspective debates premised on hi-tech understandings of communication, development, and democracy taking place in the Internet heartland; critical resources and traffic hubs are still concentrated in OECD regions. It is moot whether there is time or *head-space* for radically different future visions of information, communication, and society in agenda-setting arenas such as the IGF, ICANN, or European Commission.[3] That said, many parts of the world on the *wrong side* of this divide have been proactive from the early days of the web; getting access by leveraging satellite connections or web-addresses, attracting direct foreign investment from the information and communication technology sector, setting up public access in culturally specific ways; e.g. Tonga in the south Pacific and other small island states in the Caribbean. Other governments, such as those of Brazil, Costa Rica, and New Guinea are working hard to close the gap; in various though not uncontroversial ways.

What is easy to overlook is how at no point are the technological means, political will, economic resources, or public support foregone conclusions in such *restructuring* or *roll-out* projects; policy priorities change with political and social transformations (e.g. a transition from military to civilian democratic rule), investment horizons shrink, or expand as transnational corporations restructure, or look to take advantage of UN sponsored *capacity building* priorities by setting up shop in areas where (women and young people's) labour is cheap; e.g. call-centres, microprocessor factories in India and sub-Saharan Africa.

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2 The term *global information infrastructure* is attributed to the speech Al Gore gave in the mid-1990's (Gore, 1996; OECD, 1997; Franklin, 2003). More recently, the Obama Administration launched a strategic plan around *Digital Diplomacy* with Hillary Clinton carrying the banner (Camenetz, 2011). The term *disjuncture and differences* comes from Arjun Appadurai where he challenges accepted wisdoms about globalization as cultural homogenisation (Appadurai, 1990; see also Scholte, 2000; Franklin, 2010).

3 *ICTs for Development* and more recently *Internet Governance for Development* are rubrics under which a wide range of positions have been taken in multilateral consultations and regional levels (Gurumurthy and Singh, 2010).

Aims and organization

These interrogations frame a point of critique underscoring this reflection. Namely that setting out to think about what form and substance a future information society, however defined, might take as if this were purely a problem-solving exercise is to let the tail wag the dog. The social means do not justify the technological ends in other words.

First I discuss the way different assumptions about the relationship between technology on the one hand and society on the other underscores deliberations further *upstream*; different worldviews matter in this respect. My own future projection, while focusing on the human-body-machine relationship, is offered here as open-ended reflections for further discussion rather than with the predictive self-confidence of professional trend-watchers. As fact is often stranger than fiction the rest of the first section gets down to business; unpacking the *mechanics* of Internet-dependent societies; not so much as the technical details of interoperability, protocols, and standards (an area of ict expertise) but how these operational terms are also imbued with non-technical values and beliefs about ways of behaving as an individual and community. Here the devil is indeed in the details, as engineers and lawmakers know.

The second section looks at how these ideas resonate in popular science fiction; a literary and entertainment genre that provides a productive filter through which to look at ongoing and emerging debates about the Internet and society in a different way. I draw on science fiction not just because I enjoy these books and films but because writers and filmmakers, from long ago and more recently, capture the social paradoxes and moral dilemmas that leaderships look to resolve and steer according to their agendas. Besides, in a multimedia, 24/7 news and entertainment context where the web plays a central role, science fiction – including science *fantasy* – films, books, and spin-offs are not just entertainment. They are also powerful public relations vehicles for research and development try-outs, inspirational sources for innovators and inventors, and a mirror by which later generations see their present reflected in these past futurist visions.

To bring things back to earth, the third section return to *live* issues; where the Internet, as part of the latest generation of *new media* has become a focal point for political and social mobilization; e.g. in which ordinary people holding mobile phones are shot at, send images of state violence around the world so that others can download or re-tweet them, news media broadcast them. However defined, the Internet has become the object and means by which governments, business, and citizens offer competing visions of how an information and communication technology-dependent world can be, from their perspective, a better place.

With these reflections I hope to trigger some alternative ways to start thinking futures. This is based on the conviction that only when we take time to critically examine our underlying operating principles, technically but also as wider norms and values, will there be space for considering less obvious future options. In the current context this includes coming to terms with the implications of how computer-mediated communications are being (re)designed, used, and abused by powerful state actors (USA, China, Brazil inter alia), corporate players, and illicit agents.[4] By the same token, ordinary people are creating *ad hoc* forms of interoperability; between incompatible software programs, to virtually *jump over firewalls* designed to censor web content (e.g. in China) or adapt available (dumped) technologies for local needs (e.g. in rural India, Bangladesh,

[4] See Deibert (2008), Holmes (2007), Latour (2007), Mendoza (2011), Rushkoff (2010).

and deprived inner-city neighbourhoods in the US or Canada). My goal is to show that while there are many unarticulated scenarios to consider and prepare for, others are available in fictional form. Many others are already in the making; revolutions and counter-revolutions are being *digitized* as we browse, click, or tweet.

1. Terms of engagement

The opportunities created by information and communication technologies as a whole, which I enjoy and resent six out of seven days a week (Saturday is my computer-free day), along with the multilateral institutions that set the complex technical standards and legal frameworks governing their inner workings are not sidebars to larger moral or political questions. The Internet is the flagship technology of our times. As such we need to think through its current and future role in society in historical perspective; understand this technology as cultural artefact, social ordering mechanism, *supraterritorial* transmission architecture; for social betterment as well as oppression.

This is a risky line of reasoning as social and cultural concerns appear far removed from the intricacies of internet protocols, computer programming, and standard-setting. However, positioning those who focus on the sociocultural dimensions of these technicalities as *woolly idealists*, less informed than those – granted, highly trained – technicians and legal experts involved in roll-out of the next generation of the Internet is creating a false dichotomy.[5] This obscures the deeply contentious, political dimensions to how any technology becomes embedded in a specific historical moment; of unexpected cultural upheaval or social engineering. The development of the printing press and railways and their wider ramifications, for the history of the Enlightenment and Age of Empire respectively, are two such historical examples.

Having said that, paradoxes arise when moving from current practice to future scenarios with a sociocultural lens. After all these are overwhelmingly cool and hot sorts of communications; their media spin-offs and popular success often run ahead of governmental projections, commercial expectations. Here failures and false starts are as crucial to technological pasts and futures as are the success stories.[6] A second hazard is to end up debating age-old philosophical conundrums; what comes first, the (social) chicken or the (technological) egg, whether successive generations of *new media* are good or bad for society. However, there are a number of emerging philosophical themes that intersect with contemporary concerns. For example, whether *virtual reality* and web-mediated relationships are more or less real, a threat to face-to-face ones; whether human consciousness and memory are being superseded by automated web-based archiving and retrieval processes; the environmental (un)sustainability of galloping hi-tech development as e-waste dumping becomes a toxic issue.

Ahead of this list comes all manner of *cybersecurity* anxieties and potential human rights abuses in cyberspatial contexts as global terrorism and the war against it take root in both public imaginaries, jurisprudence, and the underlying operations of the Internet. My point here, to cut a long story short,

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[5] At the European level see the work done within the European Commission and through the European Dialogue on Internet Governance (EuroDIG) meetings (http://www.eurodig.org/); digital rights activist and advocacy platforms focusing on privacy, freedom of information, and accountability issues; e.g. The European Digital Rights (EDRi) collective (http://www.edri.org/).

[6] Marshall McLuhan coined the terms *hot* and *cold* media with respect to television but with a futurist sense of what was to come with digital media (McLuhan, 1964). In terms of failed technologies and notions of success see for instance a recent Dutch initiative; the *Instituut voor Briljante Mislukkingen* where *failure is an option*, sponsored by ABN-Amro (http://www.briljantemislukkingen.nl/NL/instituut/).

is that generally speaking the information and communication technologies in question feature in the literature in four poorly explicated ways; as a *deus ex machina* or silver bullet that will resolve complex problems (e.g. under-development, poverty), as a by-product yet also driving force of *globalization*.

As the second decade of the 21st century opens these narratives rumble on in the media and academe. Meanwhile human bodies and their self-created *thinking machines* draw closer to one another. Is that a bad thing? An inevitability? Can the software-hardware machines running our global communications (e.g. server-farms, routers, microprocessors, applications) continue without human, embodied and self-conscious agencies? Will organic bodies and human wills be relegated to the side-lines in a future society where digital informational imperatives frame what is possible and permissable? Let's turn to how bodies feature in present-day and futurist scenarios.

Pre-cognitive visions[7]

Trend-watchers are predicting that the visibly hi-tech communications and fashion accessories with which 25% of the world population – and rising – keep in touch with others or themselves will gradually fade from view; clunky personal computers, laptops, and mobile phones making way for more elegant micro-devices, ambient technology part of the wallpaper rather than the furniture, the *digital intelligence* of ever-smaller microprocessors integrated with, rather than attached to the human body. Imaginary scenarios have already turned into working prototypes, national technology policies, corporate R&D agendas.[8] Micro-technologies that literally get under the skin are not such a big leap in terms of current applications. Many people already have micro-processors implanted in their bodies, have their inner organs probed and corrected with computerised surgical implements, outer body or iris scanned and personal biometric data uploaded onto a database housed in a local computer or server. From hearing aids and pacemakers to heart surgery to border control posts to the microchips in our passports the physical and psycho-emotional distance between ourselves, our computer screens, software applications, and physical bodies has been decreasing for some time. How people experience intimacy and distance, belonging and exclusion, staying home and going abroad are now embedded in various degrees of computer-mediated communications; how state and non-state actors regulate these movements and relationships also.

Moving from *ubiquitous technologies* that permeate our physical surroundings to those attached to limbs and epidermis and then inside the body continues trends in what is called *media convergence*; where once separate media – goods and services – come as a single device (e.g. a smart-phone, digital television), through one service provider (e.g. Yahoo! or Google), accessed from one platform (e.g. Crome, Facebook, or Twitter). This *coupling* of technology with the human body and psyche has engaged science-fiction writers for generations; from Mary Shelley's *Frankenstein* through the present day in literature, cinema, television, and now virtual worlds and computer games. The difference between then and now is that, arguably, we have the technological means, commercial ambitions, and political will to turn these fictions, whether utopian and dystopian, into *Real Life* (RL).

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[7] This term is borrowed from the Pre-Cogs in Philip K. Dick's short story, *Minority Report*. Steven Spielberg's filmic version visualises the way those with the gift of premonitory dreams are tranquillised and wired in to a computerised police surveillance system designed to predict crimes before they happen.

[8] See Keulemans (2011, p. 14), Holmes (2007), Haraway (1990), Deibert (2008), Franklin (2003), Latour (2010, 2007).

These real and imagined prototypes require a bigger leap of imagination in sociocultural and political terms however. Their costs and benefits for the future of democratic societies, implications for human rights, economic well-being and sustainable development are hotly contested; behind our computer screens, in high-level consultations, and on the streets.

My future vision (not 20-20)

My sense of what a future *information society* could be is nonetheless not a particularly techno-centric one. Neither do I begin with the assumption that *information* is necessarily reducible to this generation's understanding of computing and all its spin-offs; distributed data-packages of zeros and ones zooming through the ether and then being reassembled at the arrival point (our desktop or web-access interface) in seconds. Nor would I assume that information needs always be defined as a commodity to be bought and sold for profit. Like others I would want to maintain a distinction between information (something to potentially *know*, possess, and use) and knowledge (how someone, or some other agent understands or acts in ways based on, yet not reducible to their having certain information). This is why the philosopher Michel Foucault talks about how knowledge – not information – as power. A society that does not value, indeed stops teaching its children how to make the distinction between information (fact retrieval) and knowledge (independent thought) is not a future I envisage with enthusiasm. This would be one where wisdom and progress is measured in crude quantitative terms; reducing knowledge and understanding to the speed and efficacy by which networked computers and their interoperating programs can generate, process, and then shift vast amounts of cumulative data-clouds around. So what!

Like my colleagues in the *Futures* workshop, my vision is filtered through received ideas and experiences; in this case ideas from science fiction. Not all science fiction is built around hi-tech artefacts, showcasing the paraphernalia that underscores the Euro-Anglo-American sponsored *Big Science* narrative of the mid-twentieth century Space Race and its Cold War R&D commitments. The television series *Star Trek*, the *Star Wars* trilogies (original and prequels) dating from the Space Age and more recent, Internet age-based films such as *The Matrix* (1999), *Minority Report* (2002), and *Inception* (2010) variously deal with themes where human, and other organic matter are interpolated, mashed up with micro-processing machinery, large-scale robotics or mechanical systems; exploited, enhanced, or subsumed for strategic purposes.

My diet here is films, but also television series where hi-tech is decidedly lo-tech, advanced human-ness is slightly eccentric, time and space an ecological rather than a mechanical construct. Here, long-running, and I will admit culturally specific and cultish shows like *Doctor Who* (and I am a lifelong follower of the Doctor, the maverick Time Lord from Planet Gallifrey) and *Red Dwarf* have been formative. Add to this list, cusp information society-era films such as *Bladerunner* and *Alien* from the late 1970's and how these overlap in their future sensibilities more recent, retro-tinged offerings such as Danny Boyle's *Sunshine* and Duncan Jones' *Moon*. The themes I turn to later are taken from the 1960's classic, *Planet of the Apes*, and a book I read before seeing any of these films; Aldous Huxley's *Brave New World*. Much later reading Philip K. Dick's *Do Electric Sheep Dream in their Sleep*, the inspiration for the film *Bladerunner*, confirmed to me the power of science fiction to be both prescient and historically astute.

In these narratives, the interplay between traditional and futurist environments and gadgets, protagonists and their home-worlds, whether machine-like or organic, spooky or entrancing,

proffer multiple interpretations and possibilities. Also fascinating is how these futurist fictions extend to extraterrestrial worlds the grand narratives of western scientific discoveries and terrestrial colonization along with the flipside of these histories; the disenchantment of under-development, Cold War space-race and disenfranchisement despite everything. All through the narratives is an ambivalence towards what these achievements mean for humanity and society as a self-appointed higher authority. There is a melancholy in storylines that privilege the innate superiority of being organic (human) when encounters with non-organic life-forms (rogue androids, overbearing or depressive robots, ship computers with hidden agendas) reveal the plasticity and precocity of their respective integrated circuitry. Whether or not these protagonists are human-made, their knowledge based on human experience stored in memory banks, take form as malevolent communities of cybernetic organisms (cyborgs) or liquid lights, their role in the larger narrative is usually that of the Other.

Tensions heighten when human protagonists are confronted by this Other, in their eyes a Savage (as in *Brave New World*, or *Planet of the Apes*), superior intelligence as non-embodied forms, or the malevolence of mutations; e.g. the Daleks' mastermind, Davros in *Dr Who* or the acid-splurging carnivorous alien metal monster in *Alien*, or the Borg in *Star Trek*. Humans are entranced or abhorred by these encounters with this Other – creature, intelligence, damaged individual, by the thought of what we may become as the limits of human-ness as flesh and blood locked in a mind-body dialectic are laid bare. When the plots are good, the narrative arc strong and the confrontation or reconciliation of beings from overlapping time-space continua includes well-drawn characterization, doesn't avoid moral ambiguity, and includes a good dose of (self-deprecating) humour, then I am taken into another way of thinking. In these other time-space continua and home-worlds, technology – informational or otherwise – is not strange. It is often the humanoids who are out of step, unaware of their own blind-spots. These science fiction adventures engage us with recognizable yet radically different futures to those PR and Marketing would have us buy into today.

So, where I would put the stress is on thinking about a future society less in terms of how much, how far, or how fast but rather in light of how the present one in which I live is no longer defined solely by physical (face to face) or territorial (nation-based) sorts of regulated, lived or desired relationships and community-formation. It is already and looks like it will continue to be one in which all sorts of intimate and distance-based (human-human, machine-human, human-avatar) interactions have traction as well. These social relations, commerce aside for the moment, are being facilitated and performed by a feedback loop of computer programming and social relations in a cumulative learning curve that affects both sides of the relationship, human organism and thinking machine, or network of thinking machines. What sort of society can we envisage by which these relationships are not simply posited in a Manichean or zero-sum stand-off; computing machines bad, humans good if flawed? After all mechanised and computerised means for enhancing everyday life and extending the human organism's survival rate are well advanced.

This brings us to another, more meta-level tension in much science fiction pertinent to this discussion. This is the push and pull between technology (gizmos, systems, weapons) on the one hand and society on the other as if they were polar opposites. It is more productive to consider how they actually collude and collide with one another in specific ways and forms; expand or devolve in mutual yet also asymmetrical ways. Straddling, and so also wrapped up in this dynamic are, first, single and communal bodies (and by association minds) and second,

individual and networked mechanical and digital devices. Thinking ahead means understanding the tension created by technology versus society as well as the *fruitful coupling* arising out of their interrelationship.[9]

Technology *and* society?

There are those who have been arguing within academic debates that human societies entered a post-human period some time over the last few decades.[10] Government-led social engineering projects or corporate-based experiments in artificial intelligence, neuromarketing, military cybernetics, or cyber-surveillance aside most of us who use information and communication technologies everyday have been engaging in various sorts of virtual relationships through computer-mediated communications or are increasingly dependent on our personalised devices or access-points. Along with our bodies, our everyday lives and working habits are increasingly co-dependent on computerised means to get things done, make sense of the world around us.

Popular debates tend to stress the downside of this cumulative process. The academic literature is deeply divided as well about whether information and communication technologies in general, and the Internet in particular is a social good or evil. Governments on the whole along with the private sector are advocates of the view that there is an economic, if not a geopolitical imperative to continuing to roll out the Internet in the first instance, and to keep a hi-tech competitive edge in the second. It would be difficult then to envisage any country-member of the European Union, or the OECD getting off this particular train.

Whilst it is faulty thinking to see these developments as either a foregone conclusion or simply a *function* of the overlapping generations of hardware and software that make up the Internet as we know it today, changes in the form and substance of everyday life over the last decades have been in tandem with computing and its spin-offs; consumer electronics, digital navigation systems, life-support systems, biotechnologies, digital communication devices. Computers – whatever form they take – and computer programming as the expertise required to make them work are now inseparable in most people's minds from the Internet. Advocates of the potential of the Internet, as indeed other technological marvels before it, for peace and prosperity base their hopes on the way it shapes and generates interconnections across time and space that have the potential to be fully rather than lopsidedly global.

For others however, the values and principles underlying this vision, based on strategic partnerships between state-actors and the private sector, are questionable; should *nowhere cease to exist?* Moreover the non-accountability of corporate ownership of crucial operations and geographical concentration in North American and western Europe of this informational vision is contested; seen as inequitable and unsustainable based on exploitation of human labour-power and natural resources from poorer regions.[11]

These less-publicised issues notwithstanding, as the 1990's world-wide web is superseded by today's Web 2.0 and the next generation of *killer apps* get underway behind our screens, a certain

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[9] The expression is from Donna Haraway's landmark essay, *A Cyborg Manifesto* (1990). For other points of view see Hamelink (1997), Latour (2010).

[10] See Hayles (1999) and Haraway (1990) in particular.

[11] Modern-day computers and information and communication technology systems are dependent on a range of precious metals, mined in central Africa under violent and war-torn conditions. At the other end of the information and communication technology equipment life-cycle non-recyclable components and technology dumping in the Global South exacerbate deteriorating environmental conditions. Our information society is highly toxic; not something to wish for in the future; see the *Basel Action Network* (http://www.ban.org/).

cultural anxiety has set in; political elites and corporate actors are working hard to convince citizens that everything is under control. Meanwhile dissenters ask who is monitoring the gatekeepers to the informational citadel; is non-use, disconnection from the global information infrastructure an option? Where does that leave how we think in future terms?[12]

First, let me present a particular way of approaching the link between past, present, and future relationships between technology and society that is often overlooked in policy-making and R&D circles and the media where technological determinism tends to prevail. This approach, *social constructivist* thinking treats even the most simple and complex and hi-end systems and devices as more than objects or tools. For instance, this means looking at how a washing machine is designed according to certain assumptions about gender-based domestic chores, work, and leisure in consumer societies; a computer's operating system based on an accessible (open-source) or non-accessible (proprietary) source-code is based on assumptions about who has the right to change and adapt the program, as well as designate which functions will become *user defaults*.

In some quarters, social constructivist thinking goes a step further. It treats even the most powerful and seemingly immutable technologies as carriers of, indeed incarnations of ideas and values. Seeing them in historical and socially specific terms means noticing where and how their development has been subject to circumstance and contestation; corporate battles over video and compact disk formats are cases in point. Just because things and programs arrive to us off-the-shelf or legislation enforces national switchovers (e.g. to digital television) doesn't mean that these outcomes are inevitable, beyond question. More radical social constructivist views study technologies as composites; as fluid not static entities despite their appearance as monolithic (systems) or default settings. Market penetration or legislation gives the illusion of inevitability. As Walter Benjamin noted back in the golden age of cinema,

> [t]he manner in which human sense perception is organised, the medium in which it is accomplished, is determined not only by nature but by historical circumstances as well."[13]

The Internet *versus* society?

So far I have set the Internet, and its composite software and hardware elements next to previous moments where technological and social change went hand in hand. What many writers from the early days of computing and up to the present day have noted that is different about information and communication technologies is the role played by computer programming; a learning curve in which machine and human, or non-human operator are both active participants in various measures. The politics lie in the design. For computing-based goods and services, the rule of law and its contention now resides with software designers, the code.[14] Those scientists, anthropologists, and engineers working on systems based on the cybernetic feed-back loop were well aware of this tension from the first days of computing.[15] To cite Douglas Rushkoff (2001):

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[12] The literature is vast; see Wyatt et al (2002), Lovink (2003), Deibert (2008), Everitt and Mills (2009), Latour (2010).

[13] Benjamin (cited in Franklin 2003, p. 591). See also Latour (2007), Mansell and Silverstone (1996), Rogers (2000) for different social constructivist takes.

[14] Coined by Lawrence Lessig (2006).

[15] Hayles (1999) reconstructs the 1940's Macey Conferences where the groundwork was laid for later generations of cybernetic thinking and its applications for civil and military uses. See also Haraway (1990), Franklin (2002), Ramage (2010), Holmes (2007), Mendoza (2011).

> computers and networks are more than mere tools: they are like living things, themselves. Unlike a rake, a pen, or even a jackhammer, a digital technology is programmed. This means it comes with instructions not just for its use, but also for itself. And as such technologies come to characterize the future of the way we live and work, the people programming them take on an increasingly important role in shaping our world and how it works. After that, it's the digital technologies themselves that will be shaping our world, both with and without our explicit cooperation.

It may look here that Rushkoff is behaving like an exponent of technological determinism. However, this cautionary note needs to be seen as what could happen if we ignore this capacity of information and communication technologies to actively shape "our world and how it works" (ibid). Not because these technologies are magical but because their designs are cultural practices and values, not simply a cluster of neutral protocols; e.g. a web-search works by pre-set hierarchies of frequency not random selection.

Let me focus on three implications of the above observation. First, thinking about any technology, single or as a system, as a social and thereby a cultural artefact, lays the stress on the etymological roots of the term technology; the Greek concept *techne* (τέχνη). *Techne* ecompasses the art as well as the craft of inventions wherein practices and *savoir-faire* count as much as the end-product.

This nuance is often lost in Anglo-American translations where the rhetoric pivots on the *thing-ness* of a technological device; essentially tools, instruments, systems that then gain *added value* or strategic value in market or geopolitical contexts. This effectively places technology outside the social, product outside process. It also renders such tools as innocent; neutral until the moment they are put into use whether for good or ill. Social constructivist approaches, returning to the older notion of *techne*, counter this assumption of neutrality in principle. Even if there is a difference between a technology that is used or not used, e.g. a gun whilst designed for killing does not kill or maim unless it is fired, this does not *ipso facto* neutralise the intent of its design.

Second, if technologies are *socially shaped* as well as social shapers then the way they become integrated with everyday life, work, and politics also means they leave their imprint on the future; e.g. the mixed legacy for indigenous populations of the railways linking west and east coast in early Settler America, as the backbone of in British colonial rule in India, or how rail connections were exploited by the Nazi war machine. Without wanting to confuse a device with a complex system, or a consumer item – even with all three are increasingly integrated in design and use terms – Internet technologies, comprised of a supraterritorial architecture, hand-held access points, and a myriad of software programmes now co-construct life-worlds, statehood, and markets.

However, and this is the paradox, initial designs and intentions can change as technologies are used, subverted or redesigned according to different principles. Back to the gun example; a flower in the barrel of a rifle (a famous photograph during the 1960s' anti-war protests symbolising *flower power*) can alter our perception of what is possible. In information and communication technology contexts, a computer, smart-phone, transmissions architecture, or operating system can be always adapted. Yet as generational layers of programs they can also become difficult to redirect. Integrated systems and their increasing levels of complexity and long-term investment commitments thereby start to take on a quasi-autonomous quality. Indeed the whole principle of mechanical and now digital forms of automation seek to exploit these qualities, as time- or cost-savers; recall the washing machine and its increasing reliance on digital programs.

The double function of software and duality of civil-military applications come into play here. Software as ideas and codes are by definition malleable making them a form of *soft power*; historically developed and appropriated by civil and military agencies. An everyday example; the compulsion to text or check our emails or social networking *wall* is based on a self-gratification feedback loop; marketers and developers exploit this Pavlov Dog reflex to develop web-based techniques for profit; automatically linking the personal information (names, photos) of users to generate tailor-made advertising revenue without permission prior to activating these functions. That sort of informatics ethos based on market penetration into my *own private cyberspace* is not a future I particularly relish either.[16]

Once significant, and I think that we can venture to suggest that the Internet falls into that category, technologies also emerge and operate as particular sorts of power. In Internet terms, control over the root server, Internet address assignations, access, or proprietary ownership of the source codes for widely used software (e.g. the operating systems running personal computers and servers) can be exercised in non-transparent, oppressive ways. This is why those technologies that have become major forces of change are held in both reverence and fear.

This brings us to the shadow side. As Douglas Rushkoff notes, many pioneers of the Internet as a social and inclusive communicative medium have become disenchanted with the direction it has been taking of late. The future here looks gloomy; the issues at stake are less technological than they are political. The implications for thinking ahead is that it is less about the techie-stuff but more that those claiming future leadership must (Rushkoff, 2011)

> take a good look at the highly centralized real world in which we live – as well as how it got that way. Only by understanding its principles, reckoning with the forces at play, and accepting the battles we have already lost, might we begin to forge ahead to create new forms that exist beyond any authority's ability to grant them protection.

What the latter statement is getting at is how Internet governance, despite its being based on a functional form of geographical distribution rather than central location (a *network of networks* whereby worktops, data-retention, and transmission are separated from one another by stationary orbital nodes or mobile antennae rather than concentrated in mainframes), is nonetheless culturally and geopolitically concentrated. How, where and when the early Internet actually began, was then developed from several quarters, was or was not a product of the US industrial-military establishment, was or was not invented by Anglo-European researchers, its commercial and civic success down to market-forces and entrepreneurship alone is a question for the history books. The point here is that at all points there have been vested interests, overt and covert looking to claim ownership, and so steer its future trajectory; by tightening their incumbent grip on critical Internet resources or dictate the terms of debate on the other. There is a lot at stake behind our screens.

Following a social constructivist line of reasoning as opposed to a determinist one, tempers this gloomy prognosis. If all technologies, large and small, simple and complex, localised and spanning the planet's surface and outer atmosphere, can be shown to be socially embedded

[16] Privacy activists and advocacy groups are very active in this area. See for example recent interventions by groups like *Bits of Freedom* against sites like *LinkedIn* using individuals' names and photos for advertising purposes (https://www.bof.nl/).

then there is room for manoeuvre. This may well require expertise, commitment and political wherewithal but as hackers (self-taught and professional) and digital activists have shown, programs are contestable, and so controvertible. I would argue that this possibility is a crucial aspect to a healthy information society; that alternatives, dissent even are not futile or excluded by default. Experts and ordinary users, and non-users as it happens have a role in a technology's future as they have had in its past.

Getting down to business

Let's look briefly at how a social constructivist vision works for specific operations, by treating terms such as *interoperability*, *standard*, or *Internet protocol* as cultural ideas as well as techno-legal specifications. In the first instance we are looking at designing communications systems whose operating premises are defined by the goal to connect, and be connected to. The computer protocols and then design standards by which this goal is to be attained and then maintained for future generations, particularly given the high level of investment required from the public purse, can only make sense if others are willing to *play the game*; willing to negotiate, plan, compromise in ways not determined entirely by supply-and-demand. Hence, even when alternative notions of interoperability, based on open source software or internationally pre-set standards (versus *de facto* ones) or even refusal to comply are in play, we are looking here at questions of on whose terms connectivity takes place. Even online dictionary and encyclopaedias make this point. The *Wikipedia* entry for *interoperability* defines it as

> a property referring to the ability of diverse systems and organizations to work together (inter-operate). The term is often used in a technical systems engineering sense, or alternatively in a broad sense, taking into account social, political, and organizational factors that impact system to system performance. [... S]everal criteria [...] can be used to discriminate between systems that are "really" inter-operable and systems that are sold as such but are not because they don't respect [...] aforementioned criteria.[17]

If "social, political, and organizational factors" are integral to ascertaining whether a system is truly or fully interoperable this raises the question of what sorts of "diverse systems" are able or willing to opt in, or are required to "respect [certain] criteria." For instance, other communicative systems, cultures based on filial loyalty, extended kinship structures around gendered blood lines, communal rather than individualistic priorities, oral and pictorial rather than written knowledge organise and live their *system* differently.

In western debates, the *system* is often posited in an oppressive relationship to everyday life or as the determining factor for human behaviour in the final analysis. In science fiction, however, the relationship between human being and *system* oscillates between its indispensability as life-support and as a malevolent force. For instance, in the film *The Matrix*, the system (said *matrix*) is at once a source of blissful ignorance and domination once innocence is lost. In *Minority Report*, the system here is a surveillance one in which Precogs (humans) are wired into a crime-prevention

[17] Wikipedia, entry for interoperability: http://en.wikipedia.org/wiki/Interoperability (14 July 2011).

system to apprehend future – potential – perpetrators for the greater good. Compelling ideas both and not so far into the future as you think.[18]

So interoperability as a necessary component to interconnected, *integrated systems* entails a trade-off between dependence and autonomy, diversity and conformity.

Moving to the building blocks of interoperability, *standards* and *protocols*. Let's return to Wikipedia; after all everyone goes there and in a future world I would want Wikipedia to continue to thrive. As there are Wikipedias in many languages, albeit some more robust than others, here too we can discern how different ways of formulating a core idea affect our vision. For instance, the English language Wikipedia defines *protocols* in purely engineering terms as a "description of a set of procedures to be followed when communicating."[19] In contrast, the Dutch Wikipedia site puts these procedures in a wider social context. This reminds the Dutch (not the English) reader that a protocol is first and foremost

> een gedragsovereenkomst, meestal in de vorm van een aantal uit te voeren stappen. Er bestaan verschillende typen protocollen, zoals 1)communicatieprotocollen, 2)computerprotocollen, 3) wetenschappelijke protocollen, 40 ceremoniële protocollen, 5) ethische protocollen, 6) verdragsprotocollen.[20]

This definition highlights what is actually at stake. A protocol is basically *an agreement about how to behave and in what order*.

Third, a brief look at the notion *standards*. To be able to interoperate parties need to "respect [certain] criteria" of which some become *standards*. Here the Dutch entry serves us well; a standard is

> een procedure of een maat waarvan een groep mensen met elkaar heeft afgesproken dat ze hem zullen gebruiken.[21]

However, in the English entry we are reminded that a *standard* is also a benchmark of quality, a form of identification, signal of belonging, and rallying point such as a flag or banner.[22] Whilst in computing terms these are embedded deep in the program, invisible to the everyday user from here we can see how technical, *de jure* and *de facto* operating standards include economic and political sorts of "agreements made between groups of people about an agreed upon procedure, quantity or measurement" (freely translated). In this way even the most arcane standards can operate as power-brokers. When institutionalised with the enforcement and decision-making power behind them by organizations such as the ISO, WTO, WIPO, or ICANN, contravening these agreements is not a technicality.

To sum up; becoming fully or even partially interoperable means being subject to the politics of standard-setting. In market-based economies the general rule has been that these standards are set by supply and demand, governments acting as project managers and only intervening when

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[18] In the United Kingdom, closed-circuit television (CCTV) systems are being currently developed whereby computer programs can process masses of data of people's movements that can isolate *suspicious* behaviour and so identify future terrorists.
[19] Wikipedia, entry for protocol; (http://en.wikipedia.org/wiki/Communications_protocol (14 July 2011).
[20] http://nl.wikipedia.org/wiki/Protocol (accessed 14 July 2011).
[21] Wikipedia, entry for standard: http://nl.wikipedia.org/wiki/Categorie:Standaard (14 July 2011).
[22] Wikipedia, entry for standard: http://en.wikipedia.org/wiki/Standard (14 July 2011).

private actors step over the line of anti-competitiveness. The reality is that intergovernmental standard-making authorities like the International Telecommunications Union are hostages to the speed by which everyday life and web-based communications are governed by corporate products and services. Whilst the US Department of Justice and European Commission settle their anti-trust cases with the likes of Microsoft out of court, the *de facto* standards by which the vast majority of the internetted world interoperates arise in ways that are neither transparent nor fully accountable. Fine when all is well, corporate players mind their manners, and governments don't misbehave. However what options are there when things go awry (e.g. the Mubarak regime and mobile phone operators in Egypt cutting off web-access during the uprisings in Tahrir Square during Spring 2011, or phone-hacking)? Is the genie out of the bottle already?

2. Imaginary futures: literary and cinematic post-human adventures

> The [future] narrative is a text of observation haunted by its Other, the imaginary. … a "culture" haunted by its "savage."[23]

Writers and film-makers in the science fiction/fantasy genres play on these tensions and power-plays. To illustrate in fictional terms and then ground these reflections in current events the next sections reconsider what interoperability means in terms of the encountered, and imaginary future Other; our alter egos, avatars, or nemeses.

With *The Matrix* in 1999 to *Inception* in 2010 where technological systems rule the external and the inner worlds, where humans are the pre-civilized and post-apocalyptic Other to non-organic agents it is easy to overlook how in many popular science fiction plots humans are but one sentient being in the universe; their machine-human relationships integral rather than added onto their everyday dealings; where machines, networks, information and other worlds are other sorts of cyborgian, organic and programmatic matter.[24] To think of any future information society is also to consider the question of what it will mean to be human. Two examples are *Brave New World* and *Planet of the Apes*.

Aldous Huxley wrote the short novel, *Brave New World*, in 1931. The future sketched there was one where test-tube babies undergo selection processes along eugenic principles of intelligence (Alphas) and physical strength. The Leisure Drug of choice is Soma; a narcotic with which burnt out citizens can space out. The anti-hero of the novel escapes his predestined fate and takes off into the no-tech hinterland to pursue an alternative lifestyle. There he meets John, the *Savage* who he takes back with him to the hi-tech heartland of the *World State*. For those who haven't read this book I won't spoil the plot.

Huxley's opening scenes describe a future that is now a reality for paying couples who want babies with a certain skin/hair colour, intelligence quotient, or physical abilities. In some parts of the world where female children are considered a burden, pre-natal scans have become a factor in a major demographic shift in India and China. In western societies, pre-natal screening technologies reveal congenital defects or genetic predispositions to expectant parents.

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[23] Certeau (1991, p. 225).

[24] The term *cyborg* refers to something quite distinct from the Blockbuster cyborgs in films such as *Terminator* or *Robocop*. It is a metaphor for a future sexual techno-politics that is not necessarily embodied as a futuristic avenging angel; given the option Haraway states she'd "rather be a cyborg than a goddess" (1990, p. 223); see also Franklin (2002, 2009).

The future vision in this novel predated the second World War and the legacy of the Nazi war machine and eugenic experiments. Yet reading the novel now in light of the PR and Marketing of biotechnology firms, the hopes held out by the Human Genome Project, and all the visualised information that hi-tech medicine has to offer health-conscious populations makes the existential struggle of the Savage and the cost of his inability to conform, his refusal to become fully interoperable, respect the dominant protocols, just as poignant as when the novel was published. The price paid for not living by the rules is a high one in *Brave New World*.

The film *Planet of the Apes*, the original version made in the late 1960's within a year of Stanley Kubrick's *2001: A Space Odyssey*, inverts the Savage motif. Here the scenario makes full use of the Space Race and achievements of both US and Soviet space exploration; the Moon landing was in 1969 and colonies on the Moon and even on Mars were projected as viable and desirable. If there wasn't life on Mars then human beings would make sure there would be.

Our heroes crash-land on their way back to Earth after achieving their mission. Three manage to free themselves from the wreckage and make their way across a desert to what they think is civilization. There they see humans in a slave-like conditions working a field; easy to conquer as the captain, played by Charlton Heston in the original, remarks. It is at that point they find themselves in the middle of a hunt. The masters in this world are apes, rounding up the humans on horseback, capturing them in nets and then imprisoning them in compounds. Our human astronauts then find themselves the subjects of experiments by ape scientists.

Here we see the western master-slave civilizational relationship inverted; throwing into relief (then 1960's) civil rights' issues around race, gender and socioeconomic disenfranchisement. The means of oppression in the name of scientific and technological advancement are in the hands of non-humans. It is only at the very end of the film that the stranded astronauts, having taken leave of friends they have made with dissident Ape-Scientists realise exactly where and in what time period they have been. Without spoiling the plot again, the final scene makes the film's critique of the limits to hi-tech modernization all too clear.

3. Real Life: the ghosts of Internets past and present

It is only recently that a number of *underwater* issues have started to bob to the surface as the Internet heads into its third if not fourth incarnation. This generation's major players are staking their future claims, taking their places for the next struggle over who controls the next generation of digital natives' news and entertainment, learning, and working lives. In this respect the Dotcom party from the 1990's and early noughties is well and truly over, the euphoria of Web 2.0 generations of social networking is fading in the face of rising anxieties over the effect extensive web-use is having on younger generations. The hangover of the day-after-the-decade-before and disillusionment about Information and Communication Technologies for Development and E-Democracy are kicking in.

Yet, at time of writing, the future of the not-yet-interoperable world is more firmly than ever premised on the advancement of computers, microprocessors and the role in enabling global levels of interconnectivity, mobility, instantaneity, and transparency; in corporate strategising documents and governmental legislation. For many observers from the pre-Internet generation, born before the digital natives of the Google Generation and so who can remember life when television was the object of comparable anxiety, this is the dystopia of the here-and-now. Future generations would do well, according to more pessimistic views, to consider their over-dependence on all things Internet, all things computer-programmed.

Here too gurus of the Internet boom period in the 1990's have been expressing misgivings about the way the Internet has been evolving. Douglas Rushkoff, cited earlier, argues that the Internet of today should not be the global standard for tomorrow. Stronger still he remind us about an overlooked historical characteristic. Namely that the (Rushkoff, 2011)

> Internet was never truly free, bottom-up, decentralized, or chaotic. Yes, it may have been designed with many nodes and redundancies for it to withstand a nuclear attack, but it has always been absolutely controlled by central authorities. From its Domain Name Servers to its IP addresses, the Internet depends on highly centralized mechanisms to send our packets from one place to another.

Nonetheless, the Internet, however defined, has become the means, the end, and the mediator of these anxieties and their future resolution. Future visions appear now to reside in virtual worlds like *Second Life*, the scores and levels of difficulties aspired to in computer games, as well as in consumer electronics like *Gameboys* and *Wii* consoles. The way these issues and devices then come to us in literary, cinematic, artistic, and popular cultural forms loops the loop; "if it isn't on Google it doesn't exist" as a child somewhere supposedly said about the marker of our present information society. Rushkoff then goes on to propose that (ibid)

> we abandon the Internet, or at least accept the fact that it has been surrendered to corporate control like pretty much everything else in Western society. It was bound to happen, and its flawed, centralized architecture made it ripe for conquest.

In the second decade of the 21st century suddenly everyone wants to have a say in how the Internet as a global imaginary should look, feel, and work in the future. Since the Wikileaks affair and the events around the Arab Spring in 2010-2011, preceded by those in Teheran and Athens where web-based *citizen journalists* and *digital activists* making full use of everyday *social media* to politically mobilize and not wait for the mainstream media to carry their message have grabbed the headlines. The politics of the future Internet's design and purpose are now in the public eye as rights-based mobilization based on digital rights make their way slowly into multilateral decision-making arenas around Internet governance; a new page may be turning but only the future will tell.[25]

4. Concluding comments, future scenarios: right here, right now

To draw these reflections to a close some final thoughts. First future thinking for those who no longer know how, or want to play is hard work with little social, economic, or political pay-back. It takes time and requires participants to let go of goal-oriented thinking, agendas, competitiveness and the urge to colonise and control the horizon of possibilities. As Brian Holmes (2007, pp. 6-8) notes:

[25] To name but three; the Brazilian Ministry of Justice partnership with the Centre for Technology and Society *Bill of Digital Rights* project. The Association for Progressive Communications' *Internet Rights Charter* (http://www.apc.org/en/node/5677), the 2011 *Charter of Internet Rights and Principles* from the Internet Rights and Principles Coalition (http://irpcharter.org/wpcharter/), all of which have emerged out of the WSIS and IGF processes. These build on precursor initiatives; see Hamelink (1997), MacBride (1980), and Jörgensen (2006). Not to be overlooked is John Perry Barlow's *Declaration for the Independence of Cyberspace* (1996): http://w2.eff.org/Censorship/Internet_censorship_bills/barlow_0296.declaration (3 August 2011).

> Our society's obsession with controlling the future – and insuring accumulation – has two consequences. The first is the organization of a consumer environment for the immediate satisfaction of anticipated desires, with the effect of eliminating desire as such. [...] The second consequence, which we have seen with such violence in recent years, is the simple removal of those who might conceivably trouble this tranquillised landscape with any kind or disturbing presences of speech.

Holmes' reference to the violence by which non-conforming communicative practices or programming configurations are removed of late, by state authorities (from the US to China) or corporate entities (e.g. the Music Majors' campaign against *piracy*) recalls the soliloquy of the dying *replicant*, played by Rutger Hauer, in Ridley Scott's film, *Bladerunner*. The soliloquy is an evocation of remembered visions of other worlds, other planets, the replicant's sadness at his pre-programmed, for him premature death; what he will be missing. The outlaw replicants desire to be treated as fully human, even when technically they are not (see the film's first scene) is comparable I would argue to the underlying tension inherent in any project of social engineering; the social choices made between closed or open-ended options, conditional access or inherent inclusiveness. In *Bladerunner* (and the original book) these replicants were interoperable yet they became social outcasts to be hunted down because of their ferocious certainty that things could be otherwise. It is not their programming that is dysfunctional but rather the underlying premise of inbuilt obsolescence that is unjust.

If the aim is to create an interoperable future (in the case of this volume one in which an *Interoperabel Nederland* can enjoy the benefits if not be part of the decision-making) then what kind of protocols and standards in social terms are at stake; what kinds of worlds do our futures want to live in and visit? Are we designing hospitable online environments as well as offline ones? Is interoperability only possible on our terms? The challenge here once again is a social and cultural attitude rather than a technical problem.

Finally, I began with an anecdote so I would like to end with a philosophical challenge. The philosopher Jacques Derrida in conversations he had with Jürgen Habermas, moderated by Giovanna Borradori shortly after the attacks of September 11, 2001 draws a provocative contrast between how we currently understand the notion of tolerance and that of hospitality. First, tolerance is in actually more a form of

> conditional hospitality ... the condition that the other follow our rules, our way of life, even our language, our cultural, our political system and so on. That is hospitality as it is commonly understood and practised. ... on a national and international – indeed, ... a "cosmopolitical" scale.[26]

By contrast, Derrida posits a more radical understanding based on a "pure and unconditional hospitality" (another sort of interoperability). One which is

> in advance open to someone who is neither expected nor invited, to whomever arrives as an absolutely foreign visitor, as a new arrival, ... wholly other. ... The visit might actually be very dangerous, and we must not ignore this fact.... An unconditional hospitality is, to be sure, practically impossible to live .... But without at least the thought of this pure and unconditional hospitality, of hospitality itself, we would ... not even be able to determine any rules for conditional hospitality (with its rituals, its legal status, its norms, its national or international conventions).[27]

[26] Jacques Derrida, in: Borradori (2003, p. 128).
[27] Derrida (op cit: pp. 128-129, original emphasis).

If interoperability is to be envisaged as a cornerstone of our future information society then which sorts of standards and protocols will enable a "pure and unconditional hospitality" or a "conditional hospitality." It is a social and cultural question. In the Netherlands and elsewhere in Europe, these two ends of the spectrum and what is possible between and alongside them is a political lightening-rod in cyberspace and on the ground.

Thinking ahead then, we need to be very wary of relying on either technological or cultural forms of determinism based on exclusionary forms of interoperability. If we do then we could well end up finding ourselves in a comparable position to the Savage in *Brave New World*, the renegade replicants in *Bladerunner*, or the stranded astronauts in *Planet of the Apes*. In that respect, we (whatever and whoever we want to be) may well be developing the means to disenfranchise the life of future generations in ways they too do not deserve.

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