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THE EMERGING POLITICAL ECONOMY OF HUMANITY 2.0
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'Humanity 2.0' refers to the title of my recent book (Fuller 2011), in which I present humanity as historically poised to re-negotiate its sense of collective identity. There are at least five reasons for this, which are addressed in this paper: (a) the prominence of digital technology in shaping everyday life and human self-understanding; (b) the advances (both promised and realized) in biotechnology that aim to extend the human condition, perhaps even into a phase that might be called 'trans-' or 'post-' human; (c) a growing sense of ecological consciousness (much of it promoted by a sense of impending global catastrophe); (d) a growing awareness of the biological similarity between humans and other animals, reviving doubts about strictly naturalistic criteria for demarcating the 'human'; (e) an increasing sense of human affection and sympathy migrating to animals and even androids, during a period when national health budgets are stretched perhaps to an unprecedented extent. The article is structured in two parts. The first part follows the humanistic implications of the claim that the computer was the innovation that most changed the human condition in the 20th century. The overriding significance of the computer provides a gateway to our emerging sense of 'Humanity 2.0'. The second part focuses on the implications of Humanity 2.0 for welfare policy, concluding with a thought experiment concerning health policy. Here the basic point is that the ontological framework for conceptualising the just liberal society is subtly shifting from the potential to the virtual as the normative benchmark of our humanity.

1. What the Computer Says about Who We Think We Are: A Portal to Humanity 2.0

You can tell a lot about the sort of creature we think we are by the value we place on the things we make. In October 2010, a widely watched on-line debate was staged on the most important technological innovation of the 20th century (*Economist* 2010). The challengers were the *digital computer* and the *artificial fertiliser*. (30-60 years earlier, *nuclear power* would have been a contender and possibly the winner.) Perhaps unsurprisingly, the computer won by a margin of 3-to-1. But why is this not surprising? After all, the artificial fertiliser is arguably the invention most responsible for a fourfold growth in the world's population over the past century, as well as reducing the proportion of those suffering from malnutrition by at least two-thirds. It would be difficult to think of another product of human ingenuity that has had such deep and lasting benefits for so many people. And even if it is true that in absolute terms there are more people living in poverty now than the entire population of the earth in 1900, the success of artificial fertilisers has kept alive the dream that all poverty is ultimately eradicable.

Yet, the artificial fertiliser was trumped by the computer – even though the computer's development has tracked, and in some cases amplified, global class divisions. Indeed, it is becoming increasingly common to speak of 'knows' and 'know-nots' in the way one spoke of 'haves' and 'have-nots' fifty years ago (Castells 2009). Here it is worth contrasting, on the one hand, the Protestant literacy drive accompanying the development of the printing press

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that over time served to reduce the power asymmetry between the producers and consumers of writing with, on the other hand, the tendency – most successfully promoted by that great computer illiterate Steve Jobs – to discourage digital denizens from having to learn programming code to get what they want from their gadgets (Appleyard 2011: chap. 6). Thus, the US media theorist Douglas Rushkoff (2010) has been compelled to compose a digital call to arms entitled 'Program or Be Programmed'. Its shock value trades on the absence of an earlier manifesto called, say, 'Write or Be Written About' – even though the epistemic authority of empirical social science over its subject matter arguably depends on the implied asymmetry. Put more pointedly: It is easy to imagine a counterfactual Steve Jobs associated with the 16th century print revolution who would have promoted a 'path of least resistance' consumer-oriented literacy policy akin to bluffing one's way through a foreign language by capitalising on cognate forms without ever properly mastering its grammar and semantics. Such a feat would require skills comparable to navigating Apple's sleek user-friendly interfaces. But would this counterfactual Jobs have been as celebrated as the actual one?

Over the ten days of debate at the *Economist* website it became clear that the computer was bound to triumph because, for better or worse, we identify more strongly with the *extension* than the *conservation* of human potential. Whether we categorise this extension as 'culture', 'technology' or, in Richard Dawkins' (1982) case, something still cast in Darwinian terms, the 'extended phenotype', it suggests that we are not fully human until or unless our biological bodies are somehow enhanced, if not outright transcended. The computer captures that desire in a twofold sense: It both provides a model for how to think of ourselves in such an enhanced state and the environment in which to realize it. UK media theorist David Berry (2011) has explored the implications of this development in terms of such computer-based technologies as iPhones and iPads that increasingly constitute the human life-world. Bluntly put, the more time people spend interacting with high-tech gadgets, the more grounds there are for claiming that what the previous generation called 'virtual reality' is becoming the actual reality in which people define themselves.

Thus, it is not surprising that an invention that 'merely' keeps alive our normal biological bodies – the artificial fertiliser – should be ranked decidedly lower than the computer in terms of importance. Indeed, the artificial fertiliser may have contributed to a compounding of humanity's problems in the 20th century by enabling a relatively superficial level of survival for the species without adequate planning for their long term flourishing. From that perspective, the persistence of poverty noted above may be explained not in terms of a lack of resolve to follow through on one's good intentions but an original failure (sin?) to recognise the incapacity of human nature to live up to its own ideals. Drawn to its logical conclusion, as done by Darwin and Spencer, and more recently Peter Singer (1999) and Steven Pinker (2002), this line of reasoning sees the sort of 'idealism' associated with the desire to expand and prolong the ranks of *Homo sapiens* as a narcissistic denial of our fundamental animal nature that only promises to keep us forever in a state of tantalised torment. In that case, would it not be better to go with the grain of nature and simply give up any hope that we might turn the planet into what the Jesuit scientist Pierre Teilhard de Chardin (1961) called a 'hominised substance'?

There is evidence that individuals are already doing that. Nearly a half-century ago the economist Thomas Schelling (1968) argued that you can tell the value that people place on their own lives by the amount they are willing to pay for securing it. The argument was originally taken to show that large defence budgets worldwide meant that people placed a sufficiently high value on their lives to render a Third World War unlikely. But considered

today, whether 'security' is defined in terms of healthcare, life insurance, development aid or military budgets, one would be left with an open verdict on the exact value that people place on the indefinite maintenance of the bodies of their birth. Despite the lip service paid to the idea of a long and safe life, there is little neuro-psychological evidence for the spontaneous inclination to make the necessary savings along the way, absent coercion, say, in the form of state taxes (Aharon and Bourgeois-Gironde 2011).

So, if we identify people's preferences with what they do rather than what they say, it would seem that beyond a certain point, people prefer to forgo physical security in favour of the freedom (and risk) to explore alternative possible modes of existence. In this context, the computer is the paradigmatic technological portal, allowing for varying degrees of 'transhumanisation': from, say, the somewhat idealised web-based self-representations that are now commonplace, through a 'Second Life' avatar that enables one to live a fantasy self alongside the actual self, to Ray Kurzweil's (2005) vision of our uploaded consciousness in machines that can function indefinitely. There is evidence that even the developing world has bought into a scaled down version of this line of thought. For example, the number of mobile phones has outstripped that of clean toilets worldwide, even in India, an emerging economic powerhouse – and the penetration of mobile phones into the population of some Third World countries outstrips that of the United States (Giridharadas 2010). Declaring these 'impoverished' mobile phone users as suffering from 'false consciousness' or some other psycho-political pathological sounds like the death rattle of the Enlightenment recipe for achieving universal human progress. Indeed, we need to take seriously that people may order their existential needs differently from, say, those enshrined in Abraham Maslow's (1954) self-actualisation theory: to wit, that the capacity to communicate with others is valued more highly than the security of one's own material conditions. Interestingly, this prospect was foreseen over thirty years by public choice economists who argued that the desirability of meeting supposedly 'fundamental' life needs, such as secure food, water and shelter, maybe be offset by the lower costs involved in meeting ' higher-order' needs, such as being plugged into social media (cf. McKenzie and Tullock 1981: chap. 20).

The normative significance so attached to the computer puts paid to one popular projection of a 'transhuman' future, whereby we become able to slow or even reverse the ageing process through gene-based interventions (De Grey 2007). This prospect has been a source of great individual hope but also great collective fear – especially from the standpoint of welfare provision and ecological sustainability. Arguably much of the urgency surrounding both the converging technologies and the climate change agendas today is fuelled by the image of an increasing number of high-producing, high-consuming humans of indefinite longevity in the not too distant future (Fuller 2011: chap. 3). But it is by no means clear that this image is widely held beyond the precincts of its upwardly mobile 'middle youth' proponents who, say, populate the audiences at TED (Technology, Entertainment and Design) lectures that have been emanating from California's Silicon Valley since 1984. Those both younger and older, as well as poorer, than TED's target demographic might simply find a computer-based future more appealing than maintaining one's biological body indefinitely. Indeed, there is no clear reason why people would want to live a long time, once it becomes socially acceptable (aka legally recognised) to 'live fast, die young'. We are already seeing a steady neglect – perhaps even abandonment – of the embodied human by those who spend most of their lives in front of a computer screen. This goes beyond the fact that obesity and heart disease are back on the rise in the First World (as well as occurring for the first time in newly developing countries).

At the same time, there is a growing underground trade in drugs originally designed to repair mental and physical deficiencies, but now retooled and remarketed to 'enhance' normal performance. Typically travelling under the rubric of 'open source' or 'do-it-yourself' biology, this development's democratic self-understanding masks the substantial risks often willingly undertaken by self-experimenting individuals (Hope 2008). To be sure, over the past half-century, there have been precedents in the development of amphetamines (Rasmussen 2008) and LSD (Langlitz 2010). Moreover, the adventurous end of bioethics has presented reasonable arguments that current 'Institutional Review Board' (IRB) constraints on human-based scientific experiments should be augmented, if not outright superseded, by a legally enforceable human 'right' or 'duty' to involvement in such experiments (Chan et al. 2011). (IBRs are university committees empowered to pass judgement on the moral propriety of proposed research.) The fundamental intuition here is that true individual liberty entails the personal assumption of risk: If people are 'free' to spend most of their disposable income on lotteries that they have little chance of winning, why cannot they be 'free' to subject themselves to research that typically has a better -- though still often less than 50% -- chance of improving their lives? One might add to this case a sense of personal responsibility for the welfare of society as a whole: After all, even a treatment that fails to improve the lives of those who undergo it will have set a negative example to be avoided by others in the future. In contrast, one's failure to pick the winning lottery number is designed precisely *not* to allow for such a collective learning experience.

At a deeper level, of course, there is nothing new about treating our biological bodies as living laboratories. Any mass change in a population's dietary regime has had long-term psychotropic effects, typically marked by a shift in the default expectations of normal behaviour (Smail 2008). Of special significance is the shift that occurred in Europe over the 18th century, whereby a diet consisting of constant low levels of alcohol consumption (partly as a water purification strategy) was replaced by one with constant low levels of caffeine consumption (via coffee and tea), alongside more concentrated doses of alcohol consumption (via spirits). This period corresponds to the Enlightenment, when radical ideas – many of which had been in the air for at least a century – began to acquire a vividness that inspired organized action, not least revolutionary overturns of ancient regimes. And even though many of these efforts turned out to be abortive, a step change had taken place in the Western collective psyche. Life's baseline pulse was quickened, such that by the 19th century the similarity of the present to the past came to be seen less as reassuring than stultifying, and products of the imagination ranging from scientific theories to economic policies were granted greater license for changing the world.

At the same time, our capacity to suppress and mask the novel forms of pain and suffering that accompanied these transformations also increased. The mass consumption of aspirin and plastic surgery in the wake of the First World War perhaps marked the tipping point into today's mindset, which is averse to any routine form of pain or suffering – indeed, to such an extent that it is now a commonly accepted standard of moral relevance, with those who inflict or suffer pain indefinitely regarded presumptively as evil or perverse (Singer 1993). But here it is worth recalling that both aspirin and plastic surgery were originally designed to minimize, if not over time erase, memories of the war experience so that soldiers who had survived the First World War could function as confident citizens in peacetime. Not surprisingly, then, these innovations were quickly marketed in the 1920s as means to increase one's positive outlook in an increasingly complex and competitive world (Chatterjee 2007). In other words, originally the pain threshold was treated as a Nietzschean challenge to be overcome in the spirit of 'what doesn't kill me makes me stronger'. But as the 20th century

wore on, no doubt influenced by the anxieties generated by the Second World War and the Cold War (and extending into the ambient 'war on terror' of our own times), the pain threshold came to be regarded in a more Schopenhauerian fashion as something to be avoided at all cost, even if that meant suicide, say, once the doses no longer have the desired effect.

While many have pathologised humanity's increasing willingness to treat the body as a biochemical testing ground, the phenomenon may also be characterised in terms of a shift from what the transhumanist philosopher Max More (2005) has called a 'precautionary' to a 'proactionary' world-view. In practice, it may point to an impending and profound division in lifestyles between those who would ideally live in perpetuity and those who would wish to make their mark as soon and sharply as possible regardless of longevity. In that case, the challenge will be to reap the most social benefit from those who wish to be 'shooting stars' so that their lives are not merely self-consuming. In principle, this should not be too difficult. Since such people, even if they are not participating in cutting edge experiments, will be leaving tracks throughout cyberspace, each one's 'death' may be seen as an absorption into virtual reality (what the 'Second Generation' of *Star Trek* called a 'borg'), a passage from one's carbon-based bodies to an immortal silicon existence. Backing this specific rite of passage is long-standing psychological evidence that genius in various fields tends to be exhibited at particular ages, after which the geniuses fall into often pathological decline, at least partly due to their felt inability to maintain that level of performance throughout their lives. While anecdotally most closely associated with mathematics and poetry, those fields are distinctive only in the relative youth of the onset of such feelings, but the feelings themselves are widespread across all fields (Simonton 1984).

A precedent for such self-affirming planned obsolescence is the euthanasia 'departure lounges' in Richard Fleischer's 1973 dystopic film, *Soylent Green.* In this case, those already with significant achievement to their credit need not bear the burden of surpassing it, once they are provided with an opportunity to witness their digital immortalisation, whereby they are captured in their prime forever, without the need to record years of decline and degradation. The price, of course, is that they agree to die now. In that case, tomorrow's 'welfare safety net' may be to do mainly with protecting one's posthumous reputation by securing a place in humanity's collective narrative. This 'politics of recognition' would mark a turn away from the Hegel-inspired version popularised by Marx as an explicit political demand made on behalf of some subaltern social category, which is supposed to be met by one's contemporaries, say, through 'affirmative action' or 'positive discrimination' legislation. Instead it would mark a return to the original Greek preoccupation for posthumous fame as the ultimate form of respect, but now understood as repeatable invocation in anecdotes or gossip or, increasingly, digital hits (Fuller 2006: chap. 9). Taken to the limit, one might envisage here a revaluation of what Hegel originally derided as 'monumentalism', the first moment in aesthetic history, exemplified by the Pyramids of Egypt, those perpetual memorials for great souls that succeeded only in establishing death cults. But now we have 'BioArt', the radical end of which envisages that a significant aspect of a person's identity (organic material, genetic code or digitised memory) might be embedded 'informatively' into an artefact that outlasts the original person (Mitchell 2010). There is already precedent in the idea of 'living architecture', whereby organic (typically plant) material is inserted into buildings to enable them to respond more flexibly to environmental changes (Armstrong 2012). Perhaps in the future buildings will be named for people who have given their very being to their construction and maintenance.

The idea that the human condition might transition from one of biology to technology revives the theological impulse that drove the Scientific Revolution of 17th century Europe, namely, that we understand the totality of life as an artefact that bears the Creator's design (Fuller 2010), a secular version of which continued to inform Kant's *Critique of Judgement*, which systematically pursues the analogy of 'purpose' in art and nature. But even if we stay within the history of biology proper, the idea of humanity as literally a 'work in progress' reigns supreme. Once the discipline entered its current scientific phase by abandoning a typological approach to species (understood as either Platonic archetypes or Aristotelian natural kinds) in favour of a populational approach (common to both Darwin and Mendel), the default position in the normative status of the individual, human or otherwise, vis-à-vis the collective also shifted. The individual came to be seen 'instrumentally' in one of two senses: either as a means to improve the species or, more simply, a vehicle for reproducing the species (Fuller 2011: chap. 5).

To be sure, 'species' does not have quite the same meaning in the two cases: the former presumes a clear *telos* that the latter does not. We now think about this difference in terms of Lamarck vs. Darwin but the original population theorists – Condorcet and Malthus – adopted these two positions, respectively. Thus, Condorcet valued unlimited population growth as an extension of the 'two heads are better than one' principle, whereas Malthus regarded population as the stage on which God displays his mastery over nature, which humans are capable of grasping in statistical terms (Fuller 2006: chap. 13). The difference here is largely theological: As heretical Catholics Lamarck and Condorcet share the Pelagian idea that humans can voluntarily achieve salvation, perhaps even by responding solicitously to perceived divine cues. In contrast, Darwin and Malthus presuppose the more Calvinist idea that individual survival is entirely in God's hands (aka natural selection), in which case our behaviour counts merely as data for the deity, not acts of persuasion that might turn the divine mind in humanity's favour (hence the 'blindness' of natural selection). To be sure, in both cases, the individual is ultimately sacrificed for some imagined end that is presumed to be of collective benefit, however that collective is defined. I have called this general emerging worldview 'Humanity 2.0' (Fuller 2011).

2. Redefining Welfare for Humanity 2.0: From the Potential to the Virtual Human

To privilege the computer as a medium of human self-expression is to challenge our well-being on at least two levels, which might be called *intensive* and *extensive*, to be explained below. Conceptually speaking, 'intensive' magnitudes presume a limit or end in terms of which one may be nearer or farther, whereas 'extensive' magnitudes exist along a dimension that may be increased indefinitely. (The underlying practical intuitions concern, respectively, measuring and counting.) But with regard to intuitions about human well-being, the natural integrity of the human body is not taken as a stable baseline intuition. In this context, it is useful to speak of an emerging world-view of 'Humanity 2.0', where 'Humanity 1.0' consists of those autonomous but sociable individuals that we normally imagine ourselves to be. Humans 1.0 are the beings that our laws have been traditionally designed to empower and protect. This aspiration was finally given global recognition after the Second World War in the United Nations Declaration of Human Rights (1948). Of course, as demonstrated by the subsequent diplomatic condemnations, trade embargos and occasional wars, the Declaration has not been sufficient to secure the well-being of Humanity 1.0. Nevertheless, it has provided a normative standard against which regimes and policies have been legitimately judged on the world stage.

One might imagine that any ideas of 'Humanity 2.0' would build upon the principles enshrined as 'Humanity 1.0'. However, this is not the case – not only because most of the world's population still lives without the material prerequisites for human dignity outlined in the Declaration – and not only because many of those people, as we saw in the last section, seem themselves to prefer having easy access to information and communication than secure food, water and shelter. Most tellingly, the concept of dignity itself is under fire as unfit for purpose as a defining characteristic of human well-being, at least if the editors of the journal *Bioethics* are to be believed (Schüklenk and Pacholczyk 2010). For them -- and they are hardly alone (see also Pinker 2008) – 'dignity' offers little more than a euphemistic invitation to think of humanity in relatively static natural law terms that sharply distinguish, say, 'therapy' and 'enhancement' as goals of biotechnological interventions, whereby the former refers to restoring someone to their original ('natural') state and the latter to some hypothesised improved ('artificial') state (Fukuyama 2003). Enforcement of this distinction lay behind George W. Bush's withholding of US federal funding from stem cell research (Briggle 2010).

More specifically, Humanity 2.0 challenges our sense of the human from an *intensive* standpoint, such that what distinguishes the 'human' from the 'non-human' is increasingly subject to degrees and variation. This is happening in the context of a neo-liberal political economy, in which what is 'normal' (either statistically or normatively) is subject to market forces. Thus, a drug that we might now consider 'brain boosting' because it enables performance that exceeds the norm may itself set the norm in the future, simply by virtue of increase uptake or even aspiration to uptake. This prospect is governed by an ideology of 'able-ism', i.e. that we end up being 'always already disabled' as the norm of competent performance drifts upward (Wolbring 2006). Health will have become a 'positional good', whereby our sense of well-being is tied directly to our comparative advantage vis-à-vis others (Hirsch 1976). Indeed, the most recent edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), due for publication in 2013, appears designed to promote this fluidity of normal human performance, much to the consternation of Allen Frances, the chief editor of the previous edition (Greenberg 2011). In particular, an increasing number of mental disorders are characterised – *à la* Freud *vis-à-vis* neuroses – in terms of a sliding scale or spectrum, as well as a larger range of 'risky' environments that might trigger a mental disorder. In the latter case, as we shall see below, the emerging science of 'epigenetics' purports to provide a biological basis.

Behind these moves to relativise quite radically the distinction between 'normal' and 'pathological' states of being is a fundamental ambivalence on the part of humans towards the bodies of their birth. After all, when compared with other animals, we take a long time to reach adulthood. This bare fact has led philosophers down through the ages to muse that we are by nature premature beings who must go beyond our native biology to complete our existence. In the 20th century, the school of thought known as 'philosophical anthropology', especially as fashioned by Helmuth Plessner, emerged to explore systematically the implications of our biological incompleteness. This project has been arguably operationalised in recent years under the rubric of 'epigenetics', an empirical investigation into the finalisation of the exact genetic make-up of individuals, which usually occurs in infancy and early childhood. The last major thinker to have taken this idea seriously was Sigmund Freud, whose claims for an Oedipal and Electra Complex was the source of ridicule by much of the scientific establishment for most of the 20th century. To be sure, Freud unfamiliar with the molecular basis of genetics, held the Lamarckian view that traumatic memories as such could

somehow shape the genome. Nevertheless, he managed to elude the spell that the Weismann Barrier (i.e. somatic changes can never *ipso facto* result in genetic changes) had cast on 20th century evolutionary theory, from which we are emerging only now (*Economist* 2006).

Even with the Weismann Barrier in place, it was thought that we might beat the genetic odds stacked against us by mastering the laws of heredity. This view was of course associated with the eugenics programme of Francis Galton, whose cousin Charles Darwin refused to endorse. Nevertheless, such 'Genetically Modified Darwinism', so to speak, survived as what may now be seen as the underground prehistory of transhumanism. A trajectory that includes various attempts – say, from US developmental psychologist James Mark Baldwin to the UK animal geneticist Conrad Waddington – to simulate Lamarckian evolution by strictly Darwinian means (Dickens 2000). Their broad common goal was to explain the apparent inheritance of acquired traits as a macro-level consequence of selection pressures on a population by proposing that those individuals already capable of expressing the requisite traits in a changed environment are reproductively advantaged. Thus, over time economic classes could morph into biological races that amount to a caste system.

Of course, the meaning of 'inheritance of acquired traits' has become more fluid with recent advances in gene therapy and other forms of biotechnology that permit strategic intervention (what theologians might regard, perhaps with some consternation, as 'intelligent design') at both ante- and post-natal stages. It is in this context that one nowadays often speaks of epigenetics as reviving the early modern idea of 'epigenesis' (Shenk 2010). In its original 18th century context, epigenesis was one side of a dispute about how to interpret microscope-based experiments concerning an organism's pattern of development. The other side was preformation. At stake, we might now say, was whether development was 'matter-led' (*epigenesis*) or 'form-led' (*preformation*). In the former case, the maturing organism is open to multiple paths of development, which in the end is determined by environmental input. In the latter case, the organism has a predetermined path of development that ultimately overcomes whatever interference the environment provides. In the language of systems theory, classical epigenesis was committed to 'plurifinality', preformation to 'equifinality'. I have referred to 'underdetermination' versus 'overdetermination' to capture this narrative difference as a general feature of historiography (Fuller 2008).

The two great 19th century evolutionists, Lamarck and Darwin, both more concerned with the natural history of entire species than the life trajectory of particular individuals, may be seen as having held opposing combinations of these two views. Lamarck was an epigenesist about individual lives but a preformationist about natural history as a whole: He believed that individuals could improve upon their inheritance in ways that brought their offspring closer to some ideal state of being. In contrast, Darwin was normally read as a preformationist about individual lives but an epigenesist about the overall course of natural history: For him, the largely genetically fixed nature of organisms discouraged any hope for indefinite survival, let alone improvement, against an environment possessing no concerns of its own, let alone those of particular organisms.

The emerging science of epigenetics renders the workings of epigenesis more transparent and hence more controllable, which arguably means that it can simulate the directionality implied in the preformationist perspective. Unlike the 20th century-style 'Genetically Modified Darwinism' discussed above, epigenesis-based policies favouring transhumanism need not be limited to realizing individual genetic potential by matching the right genomes to the right general environments. Rather, they can draw on the finding that genomic expression as such

requires exposure to the environment, especially via the chemical process of 'DNA methylation', which has been experimentally induced in animals to switch specific genes on and off (Borghol et al. 2011). By undergoing this specific process, so say today's epigenesists, organisms come to possess determinate traits, which they then maintain in the face of subsequent environmental changes and their offspring find easier to express.

At first glance, epigenetics appears to shift evolution's horizons away from Darwin's back to Lamarck's, except that Lamarck portrayed animals as deliberately changing their genetic makeup through willed effort, whereas epigenetics is, strictly speaking, about the completion of one's genetic makeup, willed or otherwise, which at birth is still not fully formed. In this respect, epigenetics challenges an assumption shared by Lamarck and Darwin – namely, that we are born with a determinate genetic makeup. This shared assumption underwrote Galton's 1874 christening of 'nature' and 'nurture' as the two independent variables involved in an organism's development. However, epigenetics would have us revisit the 18th-19th century debate between epigenesis and preformation as alternative accounts of such development (Moss 2003). Back then the concern was less with how an organism might overcome its genetic load than how it constitutes a relatively open or closed system. From this standpoint, *transhumanists* differ from *posthumanists* in their willingness to engage in epigenetic interventions to reach a desirable closure to the genome's makeup, whereas the posthumanists doubt the long-term efficacy of such efforts at strategic closure. For them all living systems are irrevocably open. In that respect, epigenetics appears exciting because it might advance the transhumanist agenda by enabling the preformationist perspective to be simulated within an epigenesis framework, as the cosmic designer comes to be internalised as a feature of the environment to which an organism is exposed during its development, namely, the 'soft eugenicist' who applies gene therapy via, say, DNA methylation.

This is a good point to turn to the specifically *extensive* challenges to our well-being. These involve the prospect that a wider range of beings may be incorporated into society's welfare function in the future – not only non-human animals but also non-animal humanoids. At the outset, it is worth recalling that classical definitions of a liberal society presuppose a set of beings, clearly marked as humans, whose capacity to affect each other is roughly the same. Thus, the ideal of such a society is often said to involve everyone enjoying the most jointly realizable freedom. In other words, I am allowed to do whatever I want as long as it does not interfere with your ability to do likewise. The ideal has been traditionally thought workable because, in the end, however much we may differ in our ends, the means at our disposal are limited to what we make of the bodies of our birth and those of consenting others. Moreover, the fact those means are roughly the same, finite and focussed on certain basic common wants and needs provides the ontological framework for both sociality and tolerance.

To see the nature of the extensive challenges to this liberal ideal, consider two senses in which societies might be judged in terms of whether they enable individuals to flourish as human beings. The usual way focuses on human *potential*, namely, the opportunities people are given to exercise their talents or 'capacities', to recall the version of popularised by Amartya Sen and Martha Nussbaum (Nussbaum and Sen 1993). To be sure, there is no predetermined sense of what people will do with those capacities, but sheer possession of them constitutes a form of natural capital that deserves to be exploited to increase the world's overall good. A rather different way of evaluating the level of humanity in a society is in terms of its overall ability to bring about human-like or humanly relevant effects, regardless of how or by whom they are achieved. In that case, sheer possession of a human body may not be necessary or perhaps even sufficient for enhancing a society's humanity. Rather, one

might think of computer avatars, android companions or even some pets as *virtual* humans who, in virtue of the networks they form with other actual humans, might be counted as functionally more 'human' than other actual humans.

The politics of the potential-virtual distinction are in practice quite subtle, but the differences in their theoretical starting points are clear enough. In terms of our earlier discussion, the potential/virtual distinction tracks the epigenesis/preformation debate, if we imagine the latter two positions as referring to entire populations rather than individual organisms. The distinction is ultimately grounded in alternative ways of glossing the expression 'being human': The politics of potentiality leads to an emphasis on what it means to *possess* humanity (and hence lends itself to talk or 'rights' and 'opportunities', both of which pre-exist any action taken by the candidate human), while the politics of virtuality pushes towards what it means to *produce* humanity (and hence lends itself to talk of 'recognition' and 'outcomes', both of which are consequent on what others make of the candidate humans). In short, the distinction turns on the difference between 'having' and 'doing' one's humanity. Separating them is a difference in temporal horizons -- a present that points to, respectively, the past and the future. Each has been compelling in formulating the ideal of a 'free society': On the one hand, we might want to live in a society that enables those marked as 'humans' from the outset to do whatever they want, regardless of consequences. On the other, we might want to live in a society composed of those that, no matter their material (including biochemical) origins, enhances the sense of humanity with which each of them most strongly identifies. Let us take each in turn.

The former society – of the 'potentially' human -- would be constituted by individuals who already at birth are sufficiently similar to allow for mutual toleration of whatever they happen to do. This line of thought, crucial to the 'rights revolution' of the 18th century, may prove to be the most persistent residue of the Biblical idea that we are all descendants of Adam. (John Locke's version of Christian dissent would be the place to begin pursuing this strand.) In Isaiah Berlin's (1958) influential terms, it provides a basis for 'negative liberty', whereby the just society is defined in terms of those willing and able to absorb the consequences of each other's actions. In contrast, the latter society -- consisting of the 'virtually' human – understands 'humanity' mainly as an end-state or a 'work in progress', which implies both a greater a tolerance for the diverse origins of its prospective members and a more exacting sense of their permissible outcomes. Such a society's would-be members would be burdened with showing that, whatever their material makeup, they are nevertheless making a recognisable contribution to the collective human project. Underwriting this conception is what Berlin called 'positive liberty', which has been associated with socialism of all ideological shades.

To be sure, a liberal society may combine elements of the potentially and the virtually human. To recall a point especially driven home by Peter Singer (1993), even if societal membership is defined in terms of possession of the relevant capacities, those capacities are salient not simply because *Homo sapiens* happens to be born with them but because they provide the means for leading a meaningful 'human' life. This suggests a more 'virtually human' welfare orientation, which in turn may require that humans make room for sufficiently 'capable' animals that could also lead such lives. Arguably this strategy was at play in the 19th century as women turned to the justice implicit in animal societies to demonstrate, by contrast, their 'inhumane' treatment in human societies (Bourke 2011). In such cases, the potentially human would seem to verge into the virtually human, such that once women secured legal rights, the idea of 'animal rights' acquired a literalness previously

lacking. Moreover, much of the excitement surrounding the recent emergence of epigenetics, noted above, is the prospect of a 'soft eugenics' programme that takes advantage of our genetic plasticity even after birth (e.g. treatments that switch genes on and off) to enable a group of beings – perhaps human and animal – to live in a more mutually compatible world.

But even before the therapeutic virtues of epigenetics have been proven, one practical political context in which the virtualisation of the human may well have some purchase in the future lies in the rationing of healthcare in social security systems associated with the welfare state. At that point, 'Humanity 2.0' is no longer a science fiction slogan but an explicit policy agenda. For example, we are mentally prepared to extend the idea of 'health' beyond the capacities of the normal human body. Indeed, we are prepared to extend it in two rather different senses. To see what I mean, imagine a two-question survey that might be conducted on the future priorities for provision by, say, the UK's National Health Service (NHS):

1. By responding to this survey, you will be covered by the NHS. Now name your two most 'significant others' who reside in this country and whose basic health needs should be covered by the NHS. You are not limited to humans in your answer (i.e. animals and androids may be named).
2. Various mental and physical 'enhancements' are regularly introduced into the market, subtly altering our default settings for normal health. At what level of market saturation for these products should the NHS make them as readily available as eyeglasses and hearing aids?

Of course, we live in tight budgetary times, but even in the best of times we would be unable to honour everyone's requests. So on what basis do we make choices? To be sure, there are many imponderables but I would like to propose the following hypotheses.

In the case of the first question, *Homo sapiens* would constitute less than 100% of the list of significant others; perhaps significantly less, if people take the question seriously. This suggests that we need to re-focus not only health provision but also medical research, as well as open up medical research budgets to, say, engineers in the business of repairing and enhancing androids. In the case of the second question, the various enhancements would alter our sense of what it means to live a fulfilling and meaningful human life. There may be some unexpected and even perverse results. Would the overall effect be to assign less value to the lives of those who, by choice of by fate, are unenhanced or unenhanceable? Moreover, some may wish to enhance their animal and android companions, whilst others may wish to turn 'enhanceability' into a threshold for a fulfilling life, below which public health provision may be withdrawn. The two wishes might even work in concert to raise the moral status of some animals and androids above some humans. Peter Singer opened the door to this way of thinking when he proffered sentience as the threshold for moral relevance in defence of animal welfare.

The NHS is a useful concrete site for thinking about Humanity 2.0 because, as the cornerstone of the UK's welfare state, it gave a very clear sense of the quality of life to which everyone was committed on behalf of everyone. The 'everyone' of course was understood to be all and only members of *Homo sapiens*, the vast majority of whom would contribute to the funding of the NHS through their taxes. Humanity 2.0 is about possibly redrawing that boundary and all the implications this has for health policy, public policy more generally and broader social and economic relations. If you still think that it is premature to take these matters seriously, I would ask you to keep three considerations in mind.

First, even though Humanity 2.0 is still in its infancy, people are already voting with their feet to get into it. The best indicator is the increasing amount of time that people spend in non-face-to-face, non-human communication. This trend may be most easily seen in the increasing number of single-person households. But even in more 'normal' social arrangements, the time spent both with animals and in front of computer-based devices implies a radical, albeit relatively quiet, transformation of the terms in which the bonds of our social life are being forged. One does not need to join in the jeremiads of Sherry Turkle (1984) and Susan Greenfield (2003) to think it is probably true that our cognitive and emotional ties are in the process of substantial re-wiring.

Second, both public and private agencies are devoting increasing resources to the 'anticipatory governance' of Humanity 2.0. This involves inviting people to test-drive innovative lifestyle-changing goods and services by participating in focus groups, citizen juries, scenario construction, wiki media and virtual reality (Barben et al. 2008). The underlying principle here is that any misgivings that people might have about such innovations – whatever their basis – may be rectified before the products come on stream. In any case, people will have begun to expect the regular appearance of, say, 'enhancement' technologies, and may even call for them to come sooner.

Consider finally, the unravelling of the social contract that underwrote the NHS and the rest of the post-World War II welfare state, which presupposed the clarity and integrity of Humanity 1.0. It is signalled in the failure of modern political ideologies to capture the imaginations of the vast majority of people, not least the young. Yet, the resurgence of fundamentalist movements focussed on race and religion points to an appetite for rethinking the boundaries of social and moral concern. At the same time, the ease with which people can opt out of any collective engagement with social welfare issues – the various flavours of 'privatisation' on offer today – suggests that a strong political vision will be needed to ensure that the identity of Humanity 2.0 doesn't simply turn into a perverse aggregate effect of many narrowly self-interested decisions.

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