

# Dawn of Immortality: Dusk of Humanity?

The Consequences of Life Extension for Human Nature



Daphne Broeks

Student number: 3012905

Thesis supervisor: Pieter Lemmens, PhD.

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Faculty of Philosophy, Theology and Religious Studies

Radboud University Nijmegen

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## Abstract

The aim of this thesis is to investigate whether or not immortality will negatively affect human nature. First, the concept of immortality is replaced with the more realistic path of life-extension through biological, robotic, and virtual enhancements. Next, the concept of human nature is investigated. As it appears that most opponents of human enhancement argue from an essentialist account of human nature, whereas many proponents subscribe to a more dynamic view of the human, both these conceptualizations are taken into account. The essentialist account of human nature is used to predict that human enhancement will lead to the disappearance of three essential features of humanity: our vulnerability, our place in nature, and our sociality. This thesis reveals that life-extension is unlikely to negatively affect these three essential features. Moreover, it also reveals that life-extension is unlikely to negatively affect human nature if the latter is interpreted as a dynamic process, like Stiegler proposes. This leads to the overall conclusion that life-extension is unlikely to endanger human nature. However, the concluding remarks do warn against the improvident consumption of human enhancement technologies.

## Introduction

“I'll tell you a secret. Something they don't teach you in your temple. The Gods envy us. They envy us because we're mortal, because any moment might be our last. Everything is more beautiful because we're doomed. You will never be lovelier than you are now. We will never be here again.”

*Troy, Wolfgang Petersen, 2004.*

“We will never be here again”, a profound sentence which I would like to repeat. For I truly believe that we, humanity, will never be here again. Standing upon the threshold of the era of human enhancement, we are allowed a brief moment of contemplation before science and technology offer us the means to realize some of our most ancient dreams. If we use this time wisely, humanity will be ready to either conscientiously accept or decisively refuse the tools to steer its own evolution. If we, however, squander this time, then the uninformed use of human enhancement technologies might mean the end of everything we hold dear, or even see us off into extinction (Bostrom, 2002).

Therefore, and in line with the U.S. President's Council on Bioethics (2003), the first assumption that this thesis must make is that converging technologies (NSF, 2002) will actually allow us to become ‘posthuman’ somewhere in the near future. A posthuman can be defined as a being that has at least one of three capacities, which greatly exceed what can currently be attained by human beings. These three capacities are emotion, cognition and health span (Bostrom, 2013). It is on the last of these three, health span, that this thesis will focus, and by extension immortality.

But what is immortality? Rose (2013) states that the difference between what he calls “biological immortality” and “mythical immortality” is that biologically immortal beings, who will not die of old age, might still succumb to accidents, infections and mutations. However, I would like to go further than that, and state that every kind of immortality will be

unable to stave off death indefinitely. This is strikingly illustrated by Isaac Asimov in *The Last Question* (1956), where mankind, though eventually little more than immortal minds soaring through the vast universe, still cannot prevent the end of time.

Although the cosmological theory underlying this work has been questioned, entropy remains a well-established concept: the passage of time since the Big Bang has been turning order into disorder. Given astronomical time-scales, the pyramids will crumble, the Mona Lisa will flake, and human beings – whether still biological or something new – will inevitably disintegrate to shadows and dust. When immortality is mentioned in this thesis, it must therefore always be interpreted as indefinite, not infinite, life extension.

Now that we know which guise of immortality is beckoning us from beyond the posthuman threshold, it is time to introduce those who would have us cross it, the so-called transhumanists. Transhumanism is defined as “a class of philosophies that pursues the continued evolution of human life beyond its current human form as a result of science and technology, guided by life-promoting principles and values” (More & Vita-More, 2013, p. 18). Examples of famous proponents are Nick Bostrom, Ray Kurzweil and Aubrey de Grey. Transhumanists will be the first to mention that human enhancement will not solve all our problems, but will also argue that the supposed benefits outweigh the postulated risks.

In direct opposition to the transhumanists we find those who would have us dawdle upon the threshold forever. They are called ‘bio-conservatives’ by the transhumanists, and believe that mankind should stay as it is, for various reasons. In *Our Posthuman Future*, Francis Fukuyama argues against genetic enhancement because he believes it threatens both our human nature and our human dignity (2002). Bill McKibben foresees that we risk losing all meaning by stepping across what he too calls ‘the threshold’ (2004). As a final example, Nicholas Agar counterbalances several transhumanistic, utopian future scenarios with far bleaker outcomes in *Humanity’s End* (2010).

A succinct characterization of these two opposing views would be to state that while transhumanism considers the enhancement of the human to be beneficial and therefore desirable, bio-conservatism considers it to be detrimental and therefore undesirable. Yet these two camps also have one important thing in common: both of them have a tendency to argue either in favour of or against human enhancement based on some conception of human nature. Where most transhumanists will state that human nature is malleable, most bio-conservatives would argue that human nature has a fixed, inviolable essence (Elkins, 2011). An essence, moreover, which stands to be eradicated by human enhancement.

I wish to investigate whether there is any merit to this bio-conservative claim that human enhancement will jeopardize human nature. Yet rather than writing yet another article that discusses the concept of human enhancement in general, I would like to specifically investigate one proposed enhancement and test if the criticisms still hold. I will therefore ask the question whether life extension will endanger human nature. I wish to see if these fears for human nature are still valid when we look, not at this large and opaque concept that is human enhancement, but at one particular enhancement that ought to do nothing else but increase our longevity. In the end, I believe that such practical analyses will help us to better understand and plan for our future, than continuing to publish articles that either demonize or glorify an idea.

First, I will view this question in the light of the essentialist conceptualization of human nature. According to the Stanford Encyclopedia, three features of human nature form the centre of the biotechnological enhancement debate: human vulnerability, humanity's place in nature, and human sociality (Juengst & Moseley, 2016). Bio-conservatives fear that human enhancement will erase these essential features of human nature, and I will question whether this is true when looking only at life extension. This analysis will take place in the second and third chapter.

Next, I will address the main question by introducing a non-essentialist definition of human nature, which at the same time gives us more to work with than the mere statement that human nature is 'malleable'. Specifically, I will introduce Bernard Stiegler's interpretation of the human and its relation to technology. Stiegler is neither a transhumanist nor a bio-conservative and considers human nature to be a dynamic process, which is never complete. Will life extension also jeopardize human nature if we interpret it as a process instead of as an essence? This analysis will happen in the fourth chapter.

Before I can do any of this, however, I must first characterize immortality based on current scientific advances and goals. I will do so in the first chapter. The speculative nature of this illustration will unquestionably be a weakness of this thesis, though one that is unavoidable, given that the intuitive definition of immortality as 'never dying' was already determined to be both incorrect and insufficient.

A final remark that must be made now is that this is neither an ethical nor a normative thesis; I will not try to convince anyone that either the transhumanist or bio-conservative view is the right one. Though, should I encounter any logical flaw in the reasoning of either side, I will surely point it out. Instead I mainly wish to show, as objectively as possible, which parts of our humanity we might have to sacrifice at the altar of immortality, if any.



## Chapter I Immortality

Homer composed the *Odyssey*, given infinite time, with infinite circumstances and changes, it is impossible that the *Odyssey* should *not* be composed at least once. No one is someone; a single immortal man is all men. Like Cornelius Agrippa, I am god, hero, philosopher, demon, and world – which is a long-winded way of saying that *I am not*.

*The Immortal*, Jorge Luis Borges, translated by Andrew Hurley

Try imagining what your existence would be like, if you had been born with the prospect of a much longer life. Would you have made different choices? Would you have never lost that childhood optimism, which vanished the moment you realized that you cannot walk all roads within one frail lifetime? Maybe you placed yourself in the midst of something like George Bernard Shaw's purposeful society of the long-lived, as portrayed in the fifth play of *Back to Methuselah* (1921). Or perhaps you counted yourself amongst the apathetic, inwardly directed sage-brutes who want nothing more but to be able to die again, as encountered in Jorge Luis Borges' *The Immortal* (1947). Or did you, as I did months ago, fail to summon a clear mental picture, and instead merely lingered on the intuition of how nice it would be, to be able to live forever?

Prior to investigating how human nature will be affected by immortality, I will therefore undertake the slightly less daunting task of illustrating the science and technology behind life extension. Perusing the related literature immediately reveals that the possibilities are as varied as the fields that seek to realize them, and three different paths to immortality become visible.

### *1.1 Biological Immortality*

The first, biological immortality, seeks to slow aging and prevent death caused by illness and old age, while still maintaining our current, biological form. Progress is made by several disparate disciplines, which will most likely have to work together to achieve biological immortality. Genetic engineering, for instance, with which gene therapies can be designed that can reduce or even revert biological aging (BioViva, 2016), and synthetic biology, with which new tissues can be created (Church & Reges, 2012). Nanotechnology also finds many applications here, of both the disease-fighting and tissue-restoring type. Ray Kurzweil has even gone so far as to state that by 2030, nanobots will have eliminated the consequences of aging (2005).



Now, more than a decade later, the proof for Kurzweil's statement is still scarce. Nevertheless, trials in mice have shown that nanotechnology can at least treat one of the most common geriatric diseases: cancer, for gold nanorods are capable of destroying a cancerous tumour with little to no damage to the surrounding regions (Soni, Tyagi, Taylor & Kumar, 2013). Human trials are forthcoming, as they should be, considering that the advantages of nanotechnology are tremendous when compared to chemotherapy or radiation. Nanoscale devices are less invasive, can be implanted, and can be excreted before becoming toxic (Kirubakaran & Thiruvengatam, 2016).

However, the truth remains that we are still only curing mice at this stage, and while we're on the subject of these tiny rodents, there is a special kind I would like to introduce: the so-called 'Methuselah-mice', who have beaten us all to the punch by achieving biological immortality, or at least greatly extended lifespans. I shall mention two of the examples that can be found on the website of the "Methuselah Foundation", which hands out grants to further longevity and rejuvenation research. Mice are chosen for their genetic similarity to humans, for that is the ultimate goal: to achieve greatly extended human health spans. One study decelerated the rate at which mice aged by restricting their caloric intake, which caused genes to express themselves in a way that on average extended the mice's lifespan by 42% (Dhabi, Kim, Mote, Beaver & Spindler, 2004). Another study managed to extend lifespan by 14% in female mice and 9% in male mice by pharmacological means, specifically Rapamycin, which most likely prevented age-related diseases like cancer, but perhaps also slowed aging generally (Harrison, Strong, Sharp, Nelson, Astle, Flurkey, et al., 2009).

Scientific progress has shown that it is certainly possible to extend life and retard aging in other mammals. It also, however, reveals a link between prolonged life and sterility, as mentioned in the President's Council on Bioethics' report: "Most of the age-retardation techniques tested in animals to this point appear to result in very significant decreases in fertility (though, as noted earlier, in some cases the effects can be uncoupled)" (2003, p. 188), and by Savalescu, Ter Meulen and Kahane: "evolutionary biologists have developed successful techniques to postpone aging in a variety of species, such as insects and rodents, by delaying the onset of reproduction" (2011, p. 440).

Explanations for this phenomenon vary. Some believe that mortality and fertility may be biologically linked. A more philosophical explanation is given by Diana Shaub, who states that "it seems as if, in pursuing an ageless body, the balance between the individual and the species is altered. When we choose vastly longer life for the individual, the propagation of the species is sacrificed" (2004, p. 40). Whatever the reason, it seems safe to assume that

biological immortality might have some negative effects on our fertility. This is not set in stone, but too common a phenomenon to be overlooked or dismissed.

In conclusion we can state that, based upon current scientific advances, it is neither certain, nor is it inconceivable, that humans might one day become biologically immortal beings, who will no longer die of old age. If we do, then this will partly be because many of the ailments of old age will be cured by advances in nanomedicine in particular, and partly because aging will be either slowed, or fully stopped, as a consequence of dietary habits, pharmacology, tissue replacements, and genetic modifications. However, like the black plague in medieval times and cholera in the industrial era, there might be a new ‘unbeatable’ illness in our future. Biologically immortal humans will, after all, always remain vulnerable to diseases, accidents and mutations (Rose, 2013).

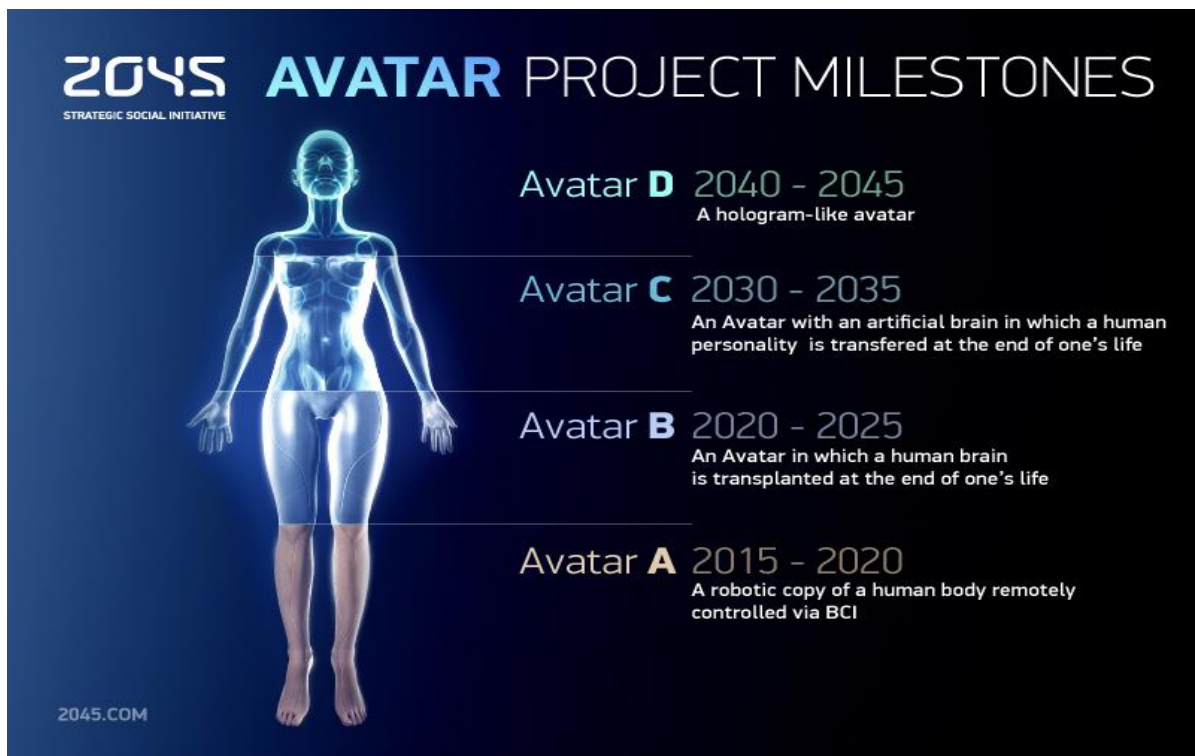
### *1.2 Robotic Immortality*

The second kind of immortality, which I call “robotic immortality”, has the appearance of making us much more robust than biological immortality ever could. In this scenario our bodies, and eventually even our brains, will be replaced by robotic or bionic parts. However, it is currently impossible for a machine to emulate a biological body part for longer than a few years. Biological systems are phenomenally robust and durable compared to engineered ones, because they are able to repair themselves. Until we can engineer robotic bodies with the ability to self-regenerate, we can hardly consider them an upgrade at all, certainly not for our longevity.

Yet even if we have self-regenerating bionic body parts, different scientific fields will still have to cooperate to make robotic immortality a reality. Most important of all are the neurosciences and computer sciences, because the success of this project will most likely depend on how advanced we can make so-called “BCIs” – Brain-Computer Interfaces.

BCIs are defined as systems which detect changes in brain signals and translate them into control commands (Wolpaw, Bidbaumer, McFarland, Pfurtscheller & Vaughan, 2002). Take, for example, an imaginary quadriplegic woman. In any other time, she would have been utterly helpless. Now, however, she can control her own wheelchair with her mind, because a BCI reads her intentions and translates them into commands (Carlson & Millan, 2013). She could even control a fighter plane in virtual reality, if she wanted to (Philip, 2015). Likewise, someone who has gone mute could have never hoped to regain speech until BCI spelling devices were invented (Birdbaumer, Ghanayim, Hinterberger, et al., 1999).

Assuming that it is still unclear how BCIs relate to immortality, let me introduce one of the most elaborate and well-funded immortality-projects of our time: Project Avatar.



2045.com

According to this plan, we will be able to closely approach immortality within the next decade, when Avatar B is expected to arrive. All we will apparently need are our brains and BCIs advanced enough to translate every neural impulse to a command over our new bodies. I am quite willing to believe that both speech and movement can be realized this way, based on the aforementioned research. However, what about sensation?

Take the feeling of the wind on your face, for example. To mimic sensation, Avatars will need something akin to nerve endings, along with a way to inform the brain of their input. This means that BCIs will have to initiate changes in the brain, rather than merely detect and translate them as they currently do. However, should BCIs learn to wholly mimic our original sensory experience, then life could actually feel quite similar.

Still, it should be noted that if this comes to pass, experiences like pain suddenly become elective. Assuming that the Avatar's body will be far more robust than our current biological form, it might be preferable to limit the feeling of pain to only those experiences that could damage the Avatar. Otherwise we would be left with useless suffering. The same rhetoric can be used to limit shivering, hunger, thirst, and countless other examples of feelings we experience because our biological body needs something.

Akin to sensation is emotion. Indeed, William James said that emotions were the experience of bodily changes (1884). A crude characterization of his theory: according to James we are afraid because we tremble, and not the other way around. However, this way of thinking would mean that people who lack sensation in their biological bodies, such as quadriplegics, would automatically also be incapable of feeling emotions. This is not the case (Bermond, Nieuwenhuyse, Fasotti & Scheurman, 1991). Instead neuroscientists have defined emotion as “an affective (positive or negative) *mental* response to a stimulus that also *may* be expressed physically (e.g., by change in heart rate, facial expression, and speech)” (Gazzaniga, Ivry & Mangun, 2009, p.670, emphasis mine). We will use fear as a means to compare our current emotional experience with that of Avatar B.

A contemporary, mortal human perceives a fearsome tiger lurking in the shadows and is immediately terrified. Then he realizes it is just a trick of the light and he no longer feels afraid but merely silly. Neurologically, two things have happened (Gazzaniga, 2009, p. 372-373). First, the visual information was projected to the thalamus, which directly sent a crude signal to his amygdala, which immediately activated his autonomic nervous system (ANS). He started to draw hurried breaths, his heart pounded in his chest as his blood pressure increased: an experience that is explained by stating that the brain is preparing the body for flight, but which is phenomenologically experienced and interpreted as fear. Simultaneously, however, the visual information was not only relayed through this quick subcortical pathway, sometimes called the ‘low-road’, but also through a slower, cortical pathway, called the ‘high road’. Here it also passed through the sensory cortex, which analysed the input more closely, and concluded that there was no tiger. This information is relayed to the amygdala, which tells the ANS to calm down, as it were.

The question, of course, is whether robotic immortals could experience fear in this same way. The proposal is to place a human brain into a robotic body, so both cortical pathways will most likely be left intact. The problem arises when we consider the ANS, which appears to be responsible for many of the outward signs and inward feelings associated with emotions. Indeed, studies have suggested that disgust, fear, embarrassment, love and compassion are all associated with different autonomic responses (Oatley, Keltner & Jenkins, 2006). Together, the parasympathetic and sympathetic branch of the ANS control everything from pupil dilation to heart-rate, from our tear glands to the rapidity of our breath (Gazzaniga, 2009, p. 87-88). Simply transplanting a brain therefore seems insufficient to safeguard the totality of our emotional experiences.

Human emotionality might be realized in the brain, but we often feel it in our bodies. Therefore, if we want to preserve our current phenomenological experience of emotions, then, upon seeing a frightening stimulus, the robotic immortal's amygdala will still have to relay this information to a system much like the ANS. However, where the biological ANS would activate a host of biological processes such as the secretion of adrenaline, the dilation of bronchi and the acceleration of heart rate, the robotic substitute should only make it feel as if we are afraid. Meaning that this robotic immortal should still feel his absent heart beating in his bionic chest, his long-forgotten lungs drawing in rapid breaths; that he should still experience that rush of fear, in short. In order to preserve our current emotional experience, BCI's would have to become advanced enough to replicate and make us aware of those sensations that would normally be caused by activation of the ANS.

The question of whether this is scientifically and technologically possible is not something I can answer. All I can say is that without something like an ANS-substitute, we might still experience emotions as mental states, but we would be deprived of part of the phenomenological experience that comes with it. In all likelihood we would lose those abilities that rely on the ANS, such as the ability to make decisions based on gut feelings – somatic markers in psychological jargon –, the ability to calm our nerves by getting a massage, or the awkward ability to feel both startled and silly all within the range of a few seconds. Perhaps we will even lose the ability to fall in love at first sight. assuming that such a process takes the 'low road'.

Besides these hypothetical negative effects – the reduction of our current sensory and emotional capacities - there are also what could be called the 'positive effects' of having your brain transplanted into an Avatar. Besides the already mentioned freedom of having the choice to feel pain, I will list three more examples. First, why settle for only five senses? Robotic optics could be set to detect infrared, electromagnetism or radiation, or we could download a module for echolocation, for instance. Second, why settle for our current human shape? We can design these robotic bodies as we wish, with wings and four arms, for instance. There is already talk of "moulding or sculpting the human form" (Vita-More, 2013), and Sandberg has argued that every human has a basic right to 'morphological freedom' - the right to modify one's own body (Sandberg, 2013). Third, if a BCI can translate brain signals into words, why shouldn't it be able to translate these same thoughts into files, which can be instantly downloaded by someone else? Once again, technology would then allow humans to do something we before would have considered to be magic: to converse with one another telepathically.

Finally, it ought to be mentioned that our brains, being biological tissue, will perish sooner than our Avatar bodies. Therefore we will have to upload our mind onto an artificial brain if we wish to stay ‘immortal.’ According to the 2045-initiative, Avatar C “requires the development of an artificial brain and a procedure for the transfer of consciousness; OR the gradual replacement of functional parts of one’s brain by equal or superior artificial versions” (2045 Foundation, 2016). The latter requirement seems easier to accomplish, especially given the BCI-infested future of our brains I have been describing. I would therefore classify it as robotic immortality. The former, mind-uploading, is still a completely hypothetical procedure, which will be discussed in the next part.

### *1.3 Substrate-Independent Immortality*

The third route to immortality proposes uploading a mind to a substrate that is not the brain, where the individual can continue to exist. We can recognize both Avatar C and D of the 2045 Initiative in this definition. Such hypothetical forms of existence are called Substrate-Independent Minds or SIMs. However, before we can even attempt to upload our consciousness onto something other than the brain that has always been its seat, we need to know what consciousness is and how it is realized. To this end, the invention of AI – artificial intelligence – could go a long way. However, science and technology are simply not there yet. Uploading a mind now would therefore be just as risky as it would have been to navigate space when only Newton’s gravitational laws were known in the past. The Einstein of consciousness has yet to arrive, and until he or she does, it is my firm conviction that we ought to tread very carefully.

There is one author, however, named Randall A. Koene, who has published quite a bit on the subject of SIMs. Here I shall discuss two of his recent works, hoping to catch a glimpse of the possible future of substrate-independent immortality. Koene states that the purpose of substrate independence is “to continue personality, individual characteristics, a manner of experiencing, and a personal way of processing those experiences” (2013, p. 219.). One of the technological paths that might lead us to SIMs is Whole Brain Emulation – WBE– which Koene discusses at length. WBE carefully studies and copies tiny parts of the brain. It tries to understand both the structural and functional aspects of our brains, and the interaction between structure and function. The problem is that creating a WBE neither guarantees nor requires a full understanding of the brain or, more importantly, of the mind.

Although Koene believes that the current lack of scientific and technological feasibility regarding SIMs can be overcome in our lifetimes, there remains one great issue: fidelity. When emulating another substrate, there will always be some divergence (Koene, 2011). A synthetic brain will simply never produce the exact same internal and external interactions that a biological brain does.

However, Koene considers this problem to be a strawman. I shall use a version of his own example to explain why, though I have to point out that it seems to rely upon an almost Cartesian dualism. Windows 10 is the operating system on my laptop. Nevertheless, I can run Mac programs on it if I wish. Running this program will not create the exact same patterns of heat in my Windows laptop as it would on a Macbook, but the program does run properly. The point here is that though the architectures may be different, we can still emulate a Macbook on my laptop and run Mac programs on it. Similarly, though the architecture of the synthetic and the biological brain are bound to differ, we can still achieve similar or, what is more likely, even better cognitive results on a synthetic substrate.

But what would our enhanced cognition be aware of? In their paper regarding WBE and its relation to embodiment and death anxiety, Linssen and Lemmens (2016) answer this question. It seems there are two options once our mind has been uploaded. The first is that of robotic telepresence: “Even though our brain emulation is taking place remotely, somewhere safe, our experience can be instantiated in these robotic avatars, which are free to roam within the range of the wireless communications link” (2016, p. 7). Yet, it is also quite possible that we do away with almost all physicality – except for the servers that emulate our brains - and instead exist as a virtual avatar in a virtual world. Both of these options have one great common denominator: that the death of the avatar, be it robotic or virtual, is not the death of the individual remotely controlling it.

Still, death remains a possibility, and we will still be aware of our mortality. “It is fundamentally impossible for WBE to offer a guaranteed, absolute immortality, only a receding probability horizon of death.” (2016, p. 11). This leads the authors to conclude that death anxiety will not vanish with uploading, but will instead take on new forms.

Assuming that SIMs can emulate all our thoughts, memories, desires and quirks, the real question is whether we would want them to. Take, for example, an individual plagued by schizophrenia. Would he prefer his mind be emulated upon a synthetic substrate as is, or would he rather that the structural and functional problems that caused his illness were corrected in the new substrate? Would this be the same person? What if he is merely at risk of developing schizophrenia, and uploading to a SIM could prevent its emergence?

Clearly, SIMs raise many questions regarding the persistence of personal identity. The same problem arises just as well for less dramatic examples. I personally have trouble remembering names, for example, so I would prefer it if the new substrate functioned slightly better in this respect. Someone else might wish they were slightly better at math, or be cleansed from a haunting childhood memory. An advanced SIM could grant such wishes, resulting in a different mind than the substrate dependent one that resided in the biological brain. This need not be an objection against SIM in and of itself, however, since a mnemonic technique, a math-camp, or a neurodegenerative disease can deliver similar results.

Unfortunately it is impossible to further investigate the problem of personal identity here. It is simply too big. However, I have thoroughly investigated this issue already (Broeks, 2016), and will summarize the most important conclusions. If we consider personal identity to be little more than a narrative fiction, then emulating our minds on another substrate need not harm our sense of self. Not even if we change some things along the way. If we, however, consider personal identity to be a pattern of mental traits or something that rests in our biological form, then our sense of self will be in danger of dying in its attempt to reach substrate independent immortality.

There is one more issue which ought to be mentioned. When we upload a mind, and grant it an embodied existence either in a virtual reality or in a robotic avatar, we once again run into the problem of how much of this existence should feel like our current existence. Will we still be hungry? Feel pain? Fear non-existent tigers or fall in love at first sight? To answer these questions would be to tread deeper into the dark reaches of speculative thought than I have already had to, given the future-oriented nature of this chapter. And yet we cannot escape them if we wish to investigate how greatly extended lives will affect human nature. Certainly, if we imagine immortal minds soaring through a vast universe on their own, then there seems little point in arguing about the state of their humanity. Similarly, if we entertain the possibility that these lives might be led in a virtual reality indistinguishable from our current existence in any way, shape, or form, then the conclusion is foregone as well.

Because I am faced with this level of uncertainty, in which any and all scenarios might be valid, and because SIMs are still several scientific mile-stones away, I have decided to exclude substrate independent immortality from further analysis. I felt it was important to show that the mysteries of consciousness and identity ought to be solved before we continue down the third road towards immortality, and that there is certainly still reason to beg the question of how such a transformation would impact human nature. Yet I am also convinced that it is too early to give a meaningful answer to this question.





## Chapter II

### Fixed Human Nature

Death (or reference to death) makes men precious and pathetic; their ghostliness is touching; any act they perform may be their last; there is no face that is not on the verge of blurring and fading away like the faces in a dream. Everything in the world of mortals has the value of the irrecoverable and contingent. Among the Immortals, on the other hand ... Nothing can occur but once, nothing is precious in peril of being lost.

*The Immortal*, Jorge Luis Borges, translated by Andrew Hurley

In the first chapter I have illustrated to the best of my abilities what we can reasonably expect immortality to be like given our current scientific goals and advances, despite the speculative nature of such an enterprise. Substrate-independent immortality was discussed, and excluded from further analysis because it is still too unclear what such an existence would be like, making any claims seemingly meaningless. Biological and robotic life-extension were also described, and despite many similarities between such an existence and our current lives, some divergences were also encountered. Most notably the link between biological life-extension and infertility, and the reduced emotional experience that robotic immortals may face.

In this chapter I will address the three essential features of human nature, why they are valued, and why they are believed to be in danger of being jeopardized by human enhancement. In the subsequent chapter I will analyse whether biological and robotic immortality will indeed endanger them. As stated before, the belief that human nature has fixed features is an essentialist point of view, mostly championed by bio-conservatives. It is not until chapter four that we will encounter a different interpretation of human nature: Bernard Stiegler's conception of the human as a dynamic process.

#### *2.1 The Vulnerable Human*

Some might say that to be human is to be flawed, to be fragile, and yet to strive ceaselessly. On this subject the Stanford Encyclopedia states that "according to one prominent view, human beings are creatures that suffer, age and die, and our struggle to deal with this vulnerability is a central aspect of what makes human life valuable (Parens 1995)." (Juengst & Moseley, 2016). There are several subgroups within this prominent view, of which two relate to the immortality-query: life-cycle traditionalists and personalists. These two groups shall be introduced after a thorough review of Parens' overarching work.

### 2.1.1 *The Fragile Human*

In the cited work by Erik Parens, the question is posed whether human enhancement might actually impoverish humans by reducing their fragility. Despite the fact that our fragility is the cause of much sorrow, several reasons are mentioned in favour of the statement that our fragility grants value to our experience of life (1995). Fragility should be understood as being subject to change and to chance. We will first discuss change.

Being subject to change means to grow, to age, to one day even die. What value could there be in this transience, the very weakness immortality attempts to overcome? According to Parens three goods are at stake: (i) the good that is our experience of some forms of the beautiful; (ii) the good that is relationships of care; (iii) and the good that is diversity across the lifespan.

The first point, regarding beauty, can most artistically be summarized in this quote: “Death is the mother of beauty” which Parens finds in Wallace Steven’s poem *Sunday Morning*. He precedes this quotation with an example of a flower’s beauty, our experience of which is enhanced by our anxiety about its demise. We appreciate a thing’s current beauty more keenly because we know that it will decay over time. If human enhancement were to reduce the degree to which we are subject to change, then, according to Parens, it might also reduce the degree to which we experience beauty.

The one, however, does not follow logically from the other. Me being subject to change or not does not matter in the slightest when I appreciate the flower. It, after all, is still mortal. Once it has withered, it will never exist again, and I, in all my changelessness, cannot change that.

The second point, regarding care, calls into question whether we, once enhanced, will ever experience caring or being cared for again. If we are no longer subject to change, we will never fall ill, but we will also never feel the warm glow of gratefulness elicited by a mother’s soup or a nurse’s expert touch. Nor will we know what it is like to care for another, assuming everyone has been immortalized. Enhancement might solve the difficulties we have with a growing elderly population, but at the cost of these valuable experiences, as well as at the cost of the valuable “shared recognition and acceptance of human neediness. That is, I take it to be valuable for us to recognize and accept our nature, and neediness is a constituent of that nature” (Parens, 1995, p. 145).

I would reply that there are a great many things we recognize as constituents of human nature that we nevertheless try to overcome. For example, we recognize that every

human being has a ‘dark side’, a self-serving, betimes even aggressive nature. It is also part of human nature to discriminate against ‘otherness’, and to value our own group so much that we are willing to go to war to defend it. We recognize and accept these cruel parts of our nature, yet do not generally condone acting upon them. Just as we do not condone individuals who wallow in their neediness and demand care, and would rather see them strive to be a more valuable part of society. To summarize: something being a constituent of human nature does not necessarily mean it is therefore undisputedly good or worth keeping around. Neediness is no exception.

It seems like the good that is beauty is not in peril, whereas the good that is neediness cannot unquestioningly be accepted as something good. Perhaps the third good that comes from being subject to change, diversity, is more convincing. It emerges from Parens’ observation that humans tend to ‘fear and hate the different’. If enhancement technologies could engineer sameness, then we might embrace this based upon our detestation of all that is divergent. Parens does not delve much deeper into this, other than giving an illustration of a playground upon which all the children are beautiful, smart and kind. His line of thought appears to be as follows: we humans discriminate against those who are different, therefore we would like to make everyone the same, a dangerous desire that should not be heeded because there is value in diversity. Unfortunately, he never clearly explains what this value is.

The most obvious value inherent in diversity, for me personally, would be the genetic diversity which makes humans, as a species, stronger against diseases. The sheer amount of diverging human forms also has aesthetic value in itself. I furthermore agree with Parens’ silent assumption that learning to deal with those who are different from oneself builds character. Yet, I must be the devil’s advocate here and ask: is it not torture to those who diverge from the norm to be ostracized? Again, we seem to come to the root of Parens’ argument: that the suffering which comes from our fragility is a valuable part of human experience. Even more valuable than the alleviation of this suffering, apparently.

Recall that human fragility was defined as being subject to change and chance. Now the three goods that come from change have been reviewed, it is time to look at Parens’ arguments in favour of chance. Being subject to chance means being subject to the ‘natural lottery’. Some people get everything: long legs, big eyes, a quick mind. Others: malformed limbs, blindness and dementia. Currently, everyone – at least in principle – has an equal chance to compete for the same jobs and positions, within the constraints placed by this natural lottery.

If, Parens states, human enhancement could wipe away the imperfections caused by the natural lottery, then the collective burden of having to take care of those who would have otherwise been dealt a bad hand, would vanish. Their personal suffering would vanish. Yet, the prize we pay for this is heavy, he warns, because reducing chance will just as much obliterate the good that is caretaking and caregiving, and the good that is diversity across the lifespan, as reducing change will. Whether immortality will indeed endanger these goods is a question that will be addressed in the third chapter. For now, we move on to the next view that discerns value in our vulnerability.

### *2.1.2 The Aging Human*

Amongst those who consider human vulnerability to be valuable to human life, we encounter so-called ‘life-cycle traditionalists’, “who criticize ambitions to control the human ageing process and extend the human life span (Callahan 1995)” (Juengst & Moseley, 2016).

Callahan speaks of the progressive incrementalist mind-set of our time, in which we consistently take small steps in prolonging life and combatting some of the illnesses associated with it. Contrary to this zeitgeist, Callahan offers one compromise and one alternative view which does not treat aging as an illness we can overcome.

The – as Callahan calls it – ‘classical’ compromise comes from Condorcet. We ought to accept aging as a biological given but medically combat the illnesses associated with it. Callahan astutely observes that this is currently not the case. We age, yes, but we also still suffer all of the diseases that come with it. He then asks: “Put another way, could it already be the case that we have come so far along the road in the extension of life, and so far along the road in the accumulation of the chronic and degenerative disease of aging, that only some radical science can save us?” (Callahan, 1995, p. 21).

Opposed to such a radical science, Callahan places a life-cycle traditionalist account, in which aging is not viewed as an obstacle we must overcome, but as a condition we all go through, which we can at best “alleviate and ameliorate”. Contrary to progressive incrementalism, which wants to overcome all biological boundaries and go as far as medically possible, life-cycle traditionalism does not indulge in such dreams.

Callahan believes that the life-cycle traditionalist view is better when we truly wish to make sense of aging, for two reasons. Firstly, it is more realistic, given the evidence that old age and illness cannot yet be separated. For the past century we have lived longer, but sickness and disability have also increased. This realism helps to counterbalance the

optimism of progressive incrementalism. Secondly, life-cycle traditionalism is more helpful when we want to come to terms with our aging. It reveals the truth: we will not be eternally healthy. We can then accept this truth, instead of fight against it as progressive incrementalism does.

If I may summarize Callahan's entry: the aimlessness of progressive incrementalism gives us nothing to hold on to, while the acceptance of old age and death does. The hope to live longer and healthier lives ought therefore to be substituted by the hope to age gracefully and to exit the stage with dignity.

It seems that such a progressive incrementalist mind-set lurks behind many transhumanist viewpoints. Life-cycle traditionalism, on the other hand, seems to be more closely linked to the mind-set of bio-conservatism. What is more valuable, we might ask, the almost blind pursuit of medical progress, or gazing unblinkingly at the harshness of old age? One could argue that mentally preparing for the truth of old age and death leaves little room for dreams, which so often have been the fuel for actual scientific progress. One could also argue, however, that after living a life wrapped up in dreams of immortality, it must come as a shock to find yourself decaying on your deathbed. In this last case, the transhumanist in question may well wish that more funding had gone to 'alleviation and amelioration' and less to enhancement programs.

Can we conclusively argue that one mind-set is truly better than the other? Callahan certainly believes so, as proven by his stalwart defence of life-cycle traditionalism. Yet I, personally, believe that progressive incrementalism has just as much going for it. Progressive incrementalism means that progress is made in small steps. Our current medical paradigm therefore does not seem all that different from the often silent assumption behind every academic endeavour. I was taught at university that if every one of us does our small part, tries to understand but the tiniest bit of this complex reality, then together we might be able to figure it out. Simply put, the speculation is that if every individual takes one small step, then together we can cross the universe. Yet if, as life-cycle traditionalism would have it, we only attempt to make our current place as comfortable as possible, then we will be stuck with the same scenery forever.

Callahan is not the only proponent of a life-traditionalist point of view, however. The U.S. President's Council on Bioethics also wonders whether we, once we are sufficiently able to retard aging, will still be able to make sense of our passage through life, or whether we will be left "unhinged from the life-cycle."

*“But in considering the offer [of longer life], we must take into account the value inherent in the human life cycle, in the process of aging, and in the knowledge we have of our mortality as we experience it. We should recognize that age retardation may irreparably distort these and leave us living lives that, whatever else they might become, are in fundamental ways different from—and perhaps less serious or rich than—what we have to this point understood to be truly human.”* (2003, p. 192).

But what exactly is the value inherent in the human life-cycle, of which we are in danger of being unhinged by age retardation? According to the President’s Council, the result of aging is “the form and contour of our life experienced in time” (2003, p. 184). This means that each stage of life is understood as relative to the other stages and total years lived. Say we are able to prolong each stage of life equally, then, according to the Council, our understanding of the relationship between years lived and stages of life would change. Furthermore, our attitudes towards and expectations of life will change as we expect to live longer lives. Likewise, our attitudes towards and expectations of death will change, as we come to see mortality as something we can oppose, and not as something we must accept.

The problem with all these observations regarding the impact that age retardation may have on an individual, is that they all talk about change. Change, no matter how much we as a species may be fearful of it, can just as often be an improvement as a deterioration. What the President’s Council seems to say is the following: our current understanding of the lifecycle, of life and of death are valuable; they endow a mortal life with form and meaning. But one could question in turn whether, if these understandings change, we are then automatically left with a meaningless, formless life. Does the expectation of longer lives, the experience of a more stretched out life-cycle, and the perception of mortality as something we can combat, truly obliterate all meaning? Or will meaning and form merely change? Questions such as these raise the suspicion that we might be dealing with a so-called status quo bias here.

A status quo bias is defined “as an inappropriate (irrational) preference for an option because it preserves the status quo” (Bostrom & Ord, 2006, p. 638). To test if this is really the case we will apply the Reversal Test. This means asking the question whether the President’s Council would object to the shortening of life, as much as to the lengthening of it. This might seem like an odd question, but considering that their answer would most likely be to reject the shortening of life, we are faced with the conclusion that they apparently consider our current life-span to be at a ‘local optimum.’ This supports the suspicion that we might be dealing with a status quo bias here, where a change in either direction is considered to be

worse than the current status quo, despite the fact that there are no grounds why this local optimum should be considered optimal.

Besides the argument derived from the current status quo – the meaning inherent in our current life-cycle – the President’s Council warns that age retardation may have four other effects. The first is positive, for significantly longer lives leave us with more time, and therefore more freedom, to pursue those things we deem worthy of pursuing. The second effect is slightly gloomier, and states that we will feel less commitment to our projects when we no longer feel as though we are using up our own precious time on this earth to complete them, which in turn might cause our sense of urgency to vanish. The third talks about childbearing, and the already visible relationship between longer lives and decreased birth rates. “[...] men and women who do not hear the biological clock ticking or do not feel the approach of their own decline might have far less interest in bearing—and, more important, caring for—children. Children are one answer to mortality” (2003, p. 189). Finally, the fourth effect, which is almost a reproduction of Callahan’s point: those of us who are committed to combat mortality are the least prepared to deal with its inevitability.

In the third chapter of this thesis we will question whether immortality, as sketched in the first chapter, will indeed bring about the effects of age-retardation as illustrated by the President’s Council and, in smaller measure, by Callahan. We will also address one incredibly important question which none of them ask, but which is posed by Diana Schaub: “In any project to lengthen life, what stage of life do we want to lengthen, all of them equally, or some more than others?” (2004, p. 40). The answer to this question will certainly have an impact on the value we attribute to this extended life waiting beyond the threshold.

### *2.1.3 The Humble Human*

Beside the life-cycle traditionalists, there exists a second group that considers our vulnerability to be a meaningful part of human life: the personalists, who “valorize the way in which human limitations are humbling and encourage modesty (Fitzgerald 2008)” (Juengst & Moseley, 2016). Before delving any deeper into this view, two things must be mentioned.

Firstly, and most importantly: the work cited here may address the viability of physiological enhancements, but certainly does not valorise human limitations. Nowhere in this chapter does Fitzgerald mention either humility or modesty, and he does not seem fearful that we might become immodest if we enhance. Instead, he summons a list of evidence-based arguments that show that physiological enhancements will most likely not bring about a



utopian future. He certainly warns us that some of the enhancements which at first sight might seem desirable, such as higher intelligence, perfect pitch, or longer lives, might actually be disenchantments. None of the arguments he offers for this emphasize the value of human limitations as humbling, however. If anything, he argues that averagely talented individuals generally live happier lives than geniuses, not more modest ones. In conclusion, rather than valorising the way in which human limitations are humbling and encourage modesty, this chapter laments the way in which technical limitations are overlooked and produce unfounded utopian scenarios.

Secondly, we have to note that humility and modesty are already said to be vanishing from our society (Konkola, 2005). Human limitations may have been humbling in the past, but today modesty belongs to a bygone era. It therefore seems strange to fear that we might lose something to human enhancement that we have already lost. Would the personalists' efforts not be better spent on combatting our current culture, which tends to transform the sin of pride into the virtue of self-esteem, than on arguing against human enhancement?

On the other hand, one might argue that as long as we still have limitations there is at least a chance for us to regain some of the modesty we have lost, and that life extension will obliterate this chance by removing our limitations. I believe that this is the main argument of the personalists, and will investigate this further in the third chapter.

## 2.2 *The Natural Human*

Some of the earliest philosophical answers to the question of what a human being is, were Aristotle's ζῷον λόγος ἔχων and ζῷον πολιτικόν, or, in their most common translation, rational animal and political animal. The common denominator here is obviously 'ζῷον'. Humans are perceived as animals, who are further distinguished by their rationality and tendency to live together in a community. Juengst & Mosely say the following in this regard:

*“The second feature of human nature that is emphasized in these debates is discussed by species preservationists and environmentalists who stress our embodiment and place in nature alongside other organisms: “by nature”, we are biological creatures of a particular family, defined by painfully evolved “species barriers”, and enhancements that blur or bend those boundaries by “directing evolution” do so at our peril (McKibben 2004)” (2016).*

I shall make an exception here, and only sparingly discuss the reference given by the Stanford Encyclopedia. For *Enough: Staying Human in an Engineered Age* by Bill McKibben is not a work that relies heavily on logical inference. It has been criticized for this very reason almost as soon as it came out (Brave, 2003; Gessert, 2004). McKibben warns us against intervening directly in the human germline, for instance to enhance human longevity, yet his arguments rely on little more than ‘gut feelings’ and vague, unsubstantiated descriptions of what it means to be human.

Nevertheless, we cannot deny that abandoning our place in nature feels a bit uncanny. If it is true that immortality will demand our ‘animal soul’ as payment, then this is still a claim that deserves to be investigated. Perhaps not through McKibben’s work, for it constantly derives an ‘ought’ from an ‘is’, but through some other source, in which logic and evidence do have their place. Because we still need to arrive at a clear idea of this feature of human nature, before we can ask whether immortality truly endangers it in the third chapter. I have therefore decided to discuss the human as a product of natural selection by introducing two men who may rightfully be called ‘authorities on the natural human.’

I would naturally be remiss to start with anyone other than Charles Darwin, who at first was wary to implicate humans as part of the evolutionary process. He did it eventually anyway, in the *The Descent of Man*. “In the *Descent*, Darwin makes it very clear that he thinks human thinking and actions, especially in the moral realm, have an evolutionary origin just as much as our physical nature” (Ruse, 2009, p.10). Apparently, Darwin believed that our thoughts, our behaviour, our sense of right and wrong, were all products of natural selection.

The man lauded as ‘Darwin’s natural heir’, Edward O. Wilson, has also waited nearly a lifetime to write about man’s place on the evolutionary stage. In his controversial yet illuminating work, *The Social Conquest of Earth*, he eventually attempts to define human nature, knowing full well that no philosopher, scientist or theologian has ever succeeded before him.

*“If the genetic code underlying human nature is too close to its molecular underpinning and the cultural universals are too far away from it, it follows that the best place to search for hereditary human nature is in between, in the rules of development prescribed by genes, through which the universals of culture are created.*

*Human nature is the inherited regularities of mental development common to our species. They are the “epigenetic rules,” which evolved by the interaction of genetic and cultural evolution that occurred over a long period in deep prehistory. These rules are the*

*genetic biases in the way our senses perceive the world, the symbolic coding by which we represent the world, the options we automatically open to ourselves, and the responses we find easiest and most rewarding to make.”* (2013, p. 174-175).

Wilson basically states that almost all of our behaviour and culture is affected by these epigenetic rules which are the consequence of natural selection. We are not born as a *tabula rasa* upon which cultural knowledge is inscribed, but instead we are born with a set of rules already engraved. This inherited architecture is human nature. Examples can be found everywhere, from the universal disgust towards incest, to the similar ways in which different cultures classify colours. Mind you, these are regularities, not reflexes; they are predispositions to behave and perceive in certain ways, not imperatives.

I would furthermore like to note that this evolutionary view of human nature is not unique to Wilson’s writings. According to Allen Buchanan “some contemporary evolutionary biologists and neuroscientists would say that if the concept of human nature has any value it is as a shorthand for those ‘hard-wired’ characteristics that most humans now have as a result of their common evolutionary development” (2011, p. 117). Again we can see that human nature is defined as those traits we have in common because we share an evolutionary past.

Finally, I would like to explain the controversy surrounding this book by Wilson, because it allows us to retrace the steps he took to arrive at such a claim about human nature. Fellow evolutionary theorists were rather upset because Wilson did not only take individual selection into account, but also group selection. That is, he believed that the traits we have inherited do not only stem from competition between individuals, but also from competition between groups or, as he likes to refer to them, tribes. Yet the explanatory power this controversial position gave him is hard to deny. Individual selection, for instance, has great difficulty explaining the existence of altruism, which is defined as an act that benefits another at the cost of one’s own individual fitness. Group selection, however, states that when competition occurs between two groups, the group with more altruists is likely to be victorious over the group with more selfish individuals. This is how altruism ‘survived’.

Essentially this leads to the conclusion that human nature – the inherited regularities that steer our perception and behaviour – is both the consequence of individual selection and of group selection. The result is an almost bipolar species, which is always torn between the traits it inherited via group selection, such as honour, duty and virtue, and the traits it acquired via individual selection, such as selfishness, hypocrisy and cowardice.

In conclusion we may ask whether we arrived at that clear idea of the natural human. From this point of view, the human appears to be a living being whose behaviour and inner world have been shaped by natural selection, just like with any other animal. Sometimes our design allows us to rise above it, for instance when we decide not to discriminate, or to be brave at our own expense. Yet there are things we cannot escape, no matter how strong our will is, such as the tiny part of the electromagnetic spectrum our eyes can perceive, or the fact that we need water, air and food to survive. That is, until we realized we might be able to enhance ourselves to see more and need less.

We are yet to discuss Wilson's most important statement for our current query, which is: "In summary, the human condition is an endemic turmoil rooted in the evolution processes that created us. The worst in our nature coexists with the best, and so it will ever be. To scrub it out, if such were possible, would make us less than human" (2013, p.57). 'Less than human' does not sound nearly as appealing as 'posthuman', and yet these are the words Wilson chose. Perhaps he did not intentionally refer to any transhumanist brand of thought, or perhaps he experienced the same feeling of uncanniness that emanates through McKibben's warnings against biomedical enhancement. Either way, this is the characterization of the natural human which we will carry with us into the third chapter, when we question whether life extension will harm it.

### *2.3 The Social Human*

The human is a vulnerable creature with its own unique place in the natural world. This much we have seen. Now we turn to the third feature that is believed to be in danger of being compromised by human enhancement: our sociality. "Human beings are social creatures that relate to one another through a complex nexus of interpersonal commitments and hierarchical structures (Liao 2006a; Liao 2006b)" (Juengst & Mosely, 2016).

#### *2.3.1 Duty: Interpersonal Commitments*

Of the three works by Liao cited here, only one deals directly with human enhancement. In this essay, Matthew Liao discusses whether *ex ante* enhancements are always permissible, as some have claimed, particularly Frances Kamm. *Ex ante* enhancements are defined as enhancements that occur before birth. Kamm argues that they are always permissible because they do not disrespect a person, for the simple reason that this person does not exist yet.

Liao disagrees. According to him, whether or not an ex ante enhancement is morally permissible does not hinge on personhood, and not even on which characteristics are going to be changed by the enhancement, but it instead hinges on the intention of the agent who enhances this unborn child.

If this agent's motives are only to ensure that this child will have the best chance possible at a good life, then the enhancements, whatever they may be, are morally just. However, if the agent's motives are dubious, then he wrongs the child by enhancing it. This might be a so-called 'harmless wrongdoing', given that the child's life will still be worth living, and that as such there is no harm done other than the agent's selfish intentions. This may, however, also cause serious harm to the individual that is yet to be born, as well as to the relationship between this child and the agent behind its enhanced nature.

When I first read the other two cited works by Liao, I wondered why they had been quoted in the Stanford Encyclopedia. As mentioned earlier, neither one discusses enhancement. Furthermore, they seemed unlikely to illustrate this "complex nexus of interpersonal commitments", considering that they were mostly concerned with the rights of children. However, whilst arguing in favour of a child's right to be loved, Liao mentions many other human rights, as well as the corresponding duties we all bear as human beings.

Children, for instance, do not only have a right to be loved, but also to be fed, sheltered, and cared for, and also have the right to an education. Adults similarly have the right to live well-fed, healthy lives. We attribute these rights to human beings because they enable the opportunity to live a good life. If you are starving, you are not likely to be happy or to be very concerned with morality, whereas when you are well fed and sheltered, you do have the opportunity to seek out fulfilment, happiness and virtue.

Human rights are sometimes not heeded, as Liao shows. Children, for instance, have a basic right to be loved because without it they might never develop the capacities required for a good life. Where there is a right, there is also always a corresponding duty. We generally believe that parents or caretakers ought to fulfil the duty of loving a child. Sometimes, however, this caretaker may not be able to provide the required amount of love because he or she is either forced to be absent from the child or is simply incapable of love. We may say that the caretaker's inability frees him or her from their duty towards the child, but the child is still in need of love nonetheless. Who is responsible for the child's being loved now?

Liao's answer: everyone; we are all associate duty-bearers. Since it would be impractical for the whole world to run into one small boy's home at the same time, a division of labour is in order. Those in close proximity to the child can spend time with it and try to love

it. Those of us who do not know the child can fulfil our duty by voting for certain policies that enable parents and caretakers to have more time and energy for their children.

Apparently to be human also means to be committed to other humans. One could say that we are all associate-duty bearers. We tax the rich so that the poor may have a chance at a better life. At one point in the not so distant past we decided that every human has a right to a good life, and all that is required for it, such as freedom, food and shelter. As a consequence, we let women study and vote, abolished slavery, implemented civil rights, overthrew dictators, and proudly signed the Universal Declaration of Human Rights. We even tried to alleviate poverty and hunger, perhaps to the best of our abilities, perhaps not.

The point seems to be that human nature, in part, means bearing the duty to ensure that every human being is able to try and have a good life. Whether life extension is morally permissible as an ex ante enhancement, and whether it will negatively impact the human role of ‘associate duty-bearer’ will be discussed in the third chapter.

### 2.3.2 Competition: Hierarchical Structures

At the time of writing, the Olympics are being held. During the opening ceremony, the IOC President Thomas Bach held a speech containing the very confusing sentence: “In this Olympic world, we are all equal.” Yet, if we were all equal, what would be the point in holding the Olympics? Is part of the reason that we hold the Olympics not to determine who amongst us is the fastest, strongest or has the best teamwork? We quite literally make the winner stand higher than the runner-up, after all. It seems like neither in the Olympic world, nor in any other, are all humans equal. We may have equal rights, but that does not make us equally talented.

The social side of human nature is therefore more than just taking care of each other, more than making sure that everyone, whether you know them or not, has a chance at a good life. The social part of our human nature also has a hierarchical, competitive side. Juengst & Mosely (2016) introduce this feature of human nature by referencing sports:

*“Many sports theorists see the “virtuous perfection of natural talents” as the goal of athletic competitions. If one accepts this view, then victories fueled by biomedical enhancements that subvert the natural interpersonal hierarchies that genetic disparities in talent create can literally “dehumanize” sport (Tolleneer, Steryck and Bonte, 2013).”*

The book cited above offers a thorough review of the ethical stances one might take concerning doping, and whether or not athletes should be allowed to use it. Rather than argue from the standpoint of health, fairness or rights, however, the authors have instead decided to look at doping through the lens of human nature. Most interesting to our current query is the assessment that doping can be perceived both as a corrosion of human nature and as a realization of human nature.

The corrosion-perspective belongs to the list of arguments contra doping. Besides the corresponding health risks, associated unfairness, and negative role models it brings, doping is also said to corrode human nature. This point of view almost always relies on a negative definition of human nature, however. A negative definition of human nature looks like this: human nature is not subhuman, meaning beastly or less than human; nor superhuman, meaning godlike or more than human; nor inhuman, meaning machinelike or different than human. In chapter five of this book, Eric T. Juengst – the same Juengst who co-authored the Stanford Encyclopedia entry I use as my main reference for the essentialist view of human nature – shows why such a negative account hardly ever works.

*“I argue that, while seductive, the content-less vision of human nature employed in these critiques leaves critics in a dangerous trap: in their efforts to be fashionably agnostic about the content of human nature they are forced back into a hierarchical genetic essentialism for sports much like those that have so repeatedly proven oppressive in other spheres of human activity” (Juengst, 2013, p. 90).*

Regarding the subhuman, or beast, Juengst refers to those authors who have warned us against crossing the species barriers. They seem to fear that by mixing the human’s inherited characteristics with those of other species, we will automatically also degrade those characteristics of human nature that we attribute value to, whatever those might be. The same feeling of repulsion also arises when we allow women to compete against men in sports, or, in the past, when people of different races or different social standings competed with one another. Juengst mentions these examples because “they suggest that there are dangers to beware in using the ‘lower boundary’ of human nature in order to criticize performance enhancement” (p.92).

Why is this dangerous? Juengst states that it is eerily similar to the premodern view that allowed us to list some people – for instance those with dark skin – as less than human, and treat them accordingly. Today, this view has thankfully been widely rejected, not in a

small part due to the findings of the natural sciences. Resurrecting it now, even if we only use it to argue against performance enhancement, would still be a true step backwards.

Where the superhuman is concerned, most critics talk about hubris. We should humbly and gracefully accept our limits, not ignore or transcend them, or, in other words: play God. Where enhancement is concerned, we should celebrate our naturally given talents, not try to enhance them. Unfortunately for proponents of the anti-hubris camp, sport has always been about striving to be faster and stronger, about transcendence. It is therefore greatly counterintuitive to look at sports only from the ‘be happy with what you’ve got’-perspective.

Finally, the inhuman. Here the concern is less with the essence of human nature, and more with the distinction between agency and artifice. After all, who deserves the credit for the amazing times the so-called ‘blade-runners’ are putting out, the athletes, or their blades? The natural or the artificial? Does it really matter? Juengst, along with several other authors such as Tamburrini and Cole-Turner, would answer that it does not. What truly matters is the sacrifices these athletes have made to be as good as they are; the dedication and effort involved in following a strict dietary regime, for instance. In other words: their agency.

After having shown that the negative definition of human nature does not offer a proper ground from which to argue against biomedical enhancements, Juengst proposes a different vantage point: the spirit of sport. The spirit of sport is a celebration of the genetic diversity created by the natural lottery, and of the hierarchy of human excellence that flows from the competition between athletes. As soon as the diversity between competitors is no longer due to inherited traits, but due to the enhancements they have been given, the spirit of sport is extinguished.

Yet is the spirit of sport worth keeping around? “To discover that the principal problem with performance enhancement’s threat to the human nature of athletes is that it threatens sport’s commitment to the creation and promotion of human genetic stratification should give us pause” (p. 101).

In the third chapter I will investigate whether the enhancements required for life extension will either transform human nature into one of the three categories that flow from the negative definition of human nature – subhuman, superhuman or inhuman - or whether they can be reasonably be expected to extinguish the spirit of sport.

Time to move onto the opposite view, which perceives doping as something that might be an expression and/or realization of human nature rather than a corrosion. This argument belongs to an inventive list of arguments pro doping, such as increased autonomy,



equal opportunities, and awe-inspiring heroism, and is derived from an ancient mythological figure: Prometheus (Franssen, 2013).

Prometheus was a Titan who stole the fire from the Olympian Gods and gave it to mankind, an act for which he was severely punished. However, the reasons behind his theft vary depending on the author. In Plato's version he stole the fire to make up for his brother's mistake, for Epimetheus had foolishly handled his task of endowing the living beings with qualities, realizing too late that there was nothing left for mankind. Because we lacked claws, fangs, and wings, Prometheus gave us the fire, which, at least in Stiegler's interpretation, symbolizes technology. However, the version of the myth that is recounted here is Aeschylus' and Hesiod's. Here, Prometheus stole the fire because Zeus wanted to eradicate mankind, and the Titan pitied us. He taught us techniques and arts, gave us wisdom; he gave us a shot to withstand the wrath of a God.

Interestingly, and as the author of this chapter, Trijsje Franssen, also remarks, Prometheus' myth is used by both proponents and opponents of human enhancement. For the proponents Prometheus exemplifies "the innate human drive to increase knowledge and abilities, even at the expense of present pains" (p. 108). All the arguments in favour of enhancement correspondingly conceive of athletes as brave, perfectionistic, transcendent beings, who, like Prometheus, would rather steal the fire and take fate into their own singed hands, than remain as they are.

For the opponents of human enhancement Prometheus exemplifies "the arrogant 'drive to mastery', that is: the hubristic tendency to want to control everything and anything (formerly) determined by nature, God, or fate" (p. 117-118). Where the proponents consider human nature to be 'the will to evolve', the opponents consider human nature to be 'gifted'. The arguments against human enhancement therefore conceive of athletes as those who harness their natural abilities, but who, if they enhance, have destroyed their human nature.

These pro and contra arguments all suffer from something called a 'naturalistic fallacy'. Just because it has so far been natural for humans to transcend boundaries and to pursue technological progress, does not mean that we ought to keep doing this. Similarly, simply because we are weak, mortal creatures now, does not mean we should stay this way. Earlier I called this 'deriving an ought from an is', and accused McKibben of making this – unfortunately commonly occurring – philosophical faux pas.

This chapter leaves us with two important conclusions. Firstly, that arguments based on an essentialist account of human nature tend to rely on a naturalistic fallacy in order to either defend or reject human enhancement. Secondly, that proponents of human

enhancement are apparently just as quick to take some essential feature of human nature and use it as a defence of enhancement, as their opponents are to use it as an argument against enhancement. What I said in the introduction to this thesis is apparently not completely true. Both transhumanists and bio-conservatives occasionally subscribe to an essentialist account of human nature, and when they do they derive some normative judgement regarding enhancement from it.

Competition, as much as duty, vulnerability and our place in nature, are current features of human nature. Nobody denies this. The most interesting question is whether we would cease to be human, if we lose these features. The answer to this question will have to wait until the fourth chapter, when I will introduce Stiegler's interpretation of the human. After that chapter, the reader ought to be able to decide for themselves which account they prefer: human nature as a list of essential features, including those addressed here, or the idea that human nature might be a dynamic process.

Yet the answer to an equally interesting question awaits us in the next chapter, where I will analyse whether life extension will jeopardize human vulnerability, our place in nature, and our sociality. Or, in other words, where we will discover if the essentialist account of human nature, that appears to be the foundation for every bio-conservative criticism and for some transhumanist defences, truly gives us a reason to reject immortality.



## Chapter III

### Immortality and the Essence of Humanity

There is nothing very remarkable about being immortal; with the exception of mankind, all creatures are immortal, for they know nothing of death. What is divine, terrible, and incomprehensible, is *to know* oneself immortal.

*The Immortal*, Jorge Luis Borges, translated by Andrew Hurley

Personally, I have always found it terrible and incomprehensible *to know* myself mortal. To know that, one day, I will know no more. Yet, say a pill were invented tomorrow that would prevent me from every dying, would I take it, after having read the previous chapter? Risk my fragility, my place in nature, my social self? Perhaps not, but then again, there are no magical pills. Therefore, we must ask whether the most likely realizations of immortality – biological and robotic life extension – will truly demand these three features of human nature as its prize.

#### *3.1 Will We Still Be Vulnerable?*

Regarding vulnerability, we reviewed Parens' work on fragility, Callahan's and the President's Council's views regarding the life-cycle, and tried to address the view that human limitations encourage modesty despite the inappropriate reference that was given. Having already addressed some of the logical flaws and doubtful conclusions of these positions, I will now investigate whether the fears regarding the corrosion of human nature by human enhancement are well-founded. Specifically, whether either biological or robotic life extension will do away with our vulnerability.

The intuitive answer would have to be: 'no, because no kind of life extension can ever remove our susceptibility to accidents, mutations, and death. Therefore, we will always be vulnerable.' A thorough analysis is required to see if this intuition is well-founded.

Parens defined fragility as being "subject to change and to chance" and identified the three goods that would be at stake if we were ever to stop being fragile. I would claim that the first good: "the experience of some forms of the beautiful" is not in danger of being erased by life extension. Not only will we still experience anxiety about the proverbial flower's decay, but we will also still fear the demise of our fellow, long-lived humans, and, most importantly, of ourselves. We will live longer, but never forever, and therefore what is 'preciously in peril of being lost' to us now, will remain so. Even if we inhabit robotic bodies.

One could still argue that because of the hypothesized reduction in the emotional range of robotic immortals – to wit, the phenomenological experience that accompanies the activation of the ANS – they will no longer fully experience this first good. Indeed, research has revealed that aesthetic experience can be measured in our physiology (Tschacher et al, 2012). Participants wore specially designed gloves that measured their skin conductance and heart rate while perusing an art gallery. A quarter of the physiological responses that were measured were caused by aesthetic experience, meaning that there is more to aesthetics than just bodily responses alone, but that bodily feelings certainly do play a role in appreciating the beautiful. As such, it seems that if we do not create a fully functioning ANS-substitute for our robotic bodies, we will miss out on a part of the aesthetic experience related to the withering flower. Then again, a robotic immortal’s experience of the beautiful ought to be indistinguishable from our current experience if we do manage to engineer a suitable replacement for our ANS.

Moving on to the second good, which is the good that is relationships of care. It seems like this will not be endangered by any kind of life extension either. Firstly, because we will always be dependent on care from others to survive. The nanorods that will singe away our cancer have to be administered by a nurse or physician, and our bionic bodies will need a check-up every once in a while. Secondly, because we will still be dependent on care from others to be happy. Life extension does not necessarily lead to happiness, after all. People will still need psychological care, whether through their father’s bionic hand on their bionic shoulder to give them strength, or by having an honest conversation with their mother accompanied by a steaming-hot cup of Rapamicyn-tea. Whether mortal or nearly immortal, we need each other to get better, and the good that is relationships of care appears to be preserved.

Lastly, we come to the good that is diversity across the lifespan. The fact that it was unclear exactly why this was a good according to Parens, does not matter if we want to analyse whether or not there will still be diversity across the lifespan when we extend our lives. Where biological immortality is concerned we can reasonably predict that there will be slightly less diversity, because the illnesses which we have eradicated to become biologically immortal will no longer show on the outside. However, even if we restrict our caloric intake, swallow all the pills, and undergo the genetic therapies, we will still look like fitter *versions of ourselves*. Knobbly knees and cauliflower ears included. The discussion of designer babies or engineered sameness therefore seems to play no role when we focus only of life-extension.

What about robotic immortality? Can we expect a lot of diversity there? Vita-More (2013) and Sandberg (2013) argue in favour of morphological freedom, which would seem to suggest that we will soon have more diversity on our hands than we have ever had before. Where we can now only emphasize our individuality with tattoos, piercings, clothing and hairstyles, we will be able to alter far more once we transplant our brains into robotic bodies. I, for example, would like to have wings, perhaps accompanied by purple eyes that glow in the dark and long, pointy ears. Assuming I will grow bored with looking like an elf, I might opt to have some parts replaced in order to make me look more like a dragon, or a phoenix, or my 21-year old self. There will be no end to our diversity once we inhabit our robotic forms, except for what money can buy and minds can imagine.

As a final conclusion regarding Parens' work on fragility I would like to say the following: Parens states that being fragile means being subject to change and chance, and warns that three goods will be in danger if we cease to be fragile. This analysis has shown, however, that we will remain fragile, even if we extend our lives. We will still be subject to change, meaning we will still grow and alter our appearance. We will also still be subject to chance, meaning that even though we might extend our lives, we still cannot control our biological appearance or personality, or prevent accidents from occurring.

On to the other two groups of theorists who perceive value in human vulnerability. Life-cycle traditionalists, who perceive value in our current life-cycle, on the one hand, and personalists, who believe that our weakness is important to keep us humble, on the other. We will first discuss life-cycle traditionalism.

One thing all humans have in common is that we go through certain stages of life. We are born, fragile and in need of care, and grow up, from childhood through adolescence, from adulthood to senescence. Incapable of stopping this ever-turning wheel other than to die. This is how it has always been, but not how it always must remain. Soon we might be able to keep ourselves looking and feeling young biologically, and, if that is not enough, to transplant our brains into a robotic body.

As discovered earlier, life-cycle traditionalists assume that life-extension will give rise to several effects, of which they fear four. Since this chapter has the purpose of discovering whether the fears of bio-conservatism are well-founded, I will only discuss the fears, and not the encouraging effect that longer lives will likely give us more freedom.

The first fear is that life-extension might lead to the loss of all meaning. We already discussed that whilst both the form of our lives and the meaning we attribute to certain life-

stages may change, we will most likely not lose all meaning, and furthermore considered that we might be dealing with a status-quo bias here.

The most important question we must ask in relation to the meaning of the lifecycle is at which age we will transplant our brains into robotic avatars. There seems to be an instinctual objection against putting a child or teenager through these procedures. Not only have their brains not fully developed yet, but they also are too young to understand the full implications of a transformation that even adults will struggle to comprehend. Adults might furthermore decide to wait until they have born and raised their children, since a robotic body cannot procreate. We therefore arrive at the most likely future scenario: humans may take steps towards biological life-extension even before they are born, but will most likely wait with robotic life-extension until the winter of their lives.

If this scenario comes to pass, then it seems as though we will only lose one part of the meaning of the life-cycle: the association between old age and illness and grief. Which, in my personal opinion, is not a loss at all, but which according to many bio-conservatives does give meaning to old age. Again we are confronted with this one question which I cannot answer, because I do not speak for all humans: is it better to suffer or to alleviate suffering?

Besides this one part of the life-cycle that we might lose - the grief and illness that comes with old age - we can at least still state that children will remain inquisitive little adventurers. The same holds true for teenagers, who might restrict their caloric intake and consume Rapamycin, but who will still feel gravely misunderstood. Whilst adults will still want to make sure they have gotten everything out of their biological form, before they vacate it. It seems that life extension will not obliterate all meaning inherent in the life-cycle, only the - to me depressing, to others meaningful - part at the end.

The second fear is that we will feel less commitment, and hence a lesser sense of urgency if our lives are extended. Since both commitment and urgency are feelings, one could argue that a robotic immortal without a proper ANS-substitute might indeed be incapable of experiencing them. However, if we assume that we will retain our full emotional range as robotic immortals, then there is no reason to assume that we will no longer feel urgency or commitment. Assuming that we will be aware that we cannot truly live forever, it stands to reason that we will still strive to finish what we started. No path towards immortality can make us impervious to accidents, infections and mutations, and therefore we will likely feel quite as vulnerable as we do now. Death might still come at any moment, which means that an almost-immortal will feel as much pressure to complete his projects as a common mortal does today.

The third fear is that we will abandon childbearing and -rearing. Where robotic immortality is concerned, these fears seem well-founded. It does not seem likely that we can or will make our robotic avatars fertile, after all. Yet biological immortality cannot promise that we can continue to bear children either. There is a link between life extension and infertility which we addressed in the first chapter. We must know exactly why and how this link exists, and ensure that it will not occur when we begin extending our lives biologically. Not because we need more humans on this overpopulated world, but because for some people being a parent is their dearest ambition.

Even if the President's Council prediction is true, and life extension will prevent us from hearing the ticking of our biological clocks, then I still believe that those with the aspiration to become parents will do so regardless. Assuming that biological life extension has not made them infertile, of course. This might lead to a smaller percentage of individuals who bear children than today. Especially if those who would have had children as an "answer to mortality" will no longer have them. Yet, as long as those who want children because they have so much unequivocal love to give will still be biologically capable of it, then our species will continue to produce new generations. Smaller generations, surely, but perhaps also more cherished ones.

The fourth fear, which was also voiced by Callahan, is that our attitudes towards mortality will become unrealistic. We might start to believe that we can outwit death itself, that we can keep dancing forever. For both biological and robotic immortality, I do not believe this will be the case. People will, hopefully, be informed of the fact that whilst these treatments ought to extend the length of their life, they will not make them impervious to accidents, infections or mutations. The knowledge that death might be lurking around every corner therefore will remain as it is today.

That is not to say that we will suddenly be better prepared to deal with our mortality. I, for instance, know that I must one day die, but the complete realization of this fact tends to elude me most of the time. Immediately I think: 'true, one day, but not this day, nor tomorrow, probably somewhere so far in the future that there is little point in dwelling on it.' This insight into my private ruminations reveals a tendency that most humans have: to avoid thinking too much about death because it makes us anxious. It seems much easier to simply live life in a way that prevents us from having any regrets when the final bell tolls, than to dwell upon that actual moment. At the same time, I find that thinking about death, accepting that I will one day be gone, gives my life a great deal of meaning. This existentialist mind-set, which I try to adopt most of the time, is shared by many others. Extending life will not make



having this mind-set impossible, on the contrary, it will be made even more powerful by the knowledge that we can never live forever, no matter how hard we try.

In short: where life-extension is concerned, those of us who have accepted that we must one day die and have given our lives meaning in the light of this realization will not change our attitudes towards mortality. Whereas those of us who are afraid of thinking about death today and hope it can be put off indefinitely, will naturally find themselves as ill-prepared to deal with its inevitability as if they were still unenhanced mortals.

We have arrived at the final view that perceives value in our vulnerability, that of the personalists, who claim that human limitations are humbling. After discussing the disappearance of humility that is already taking place in society today, the decision was made to move forward with the following interpretation: as long as we are still vulnerable, there is at least still a chance we might regain our humility. As was shown that none of the paths to immortality can make us completely invulnerable, and that they can only offer a receding probability horizon of death, we can be short here. These ‘almost-immortals’ will still have a chance to feel humble, as long as they still have feelings. And, if the off chance that they do not, then at least they will not be prideful either.

We have now reached the point where we can reach a final verdict regarding the influence of life extension on human vulnerability. The detailed analysis has proven the initial intuition to be correct: life-extension will not make us invulnerable and therefore the goods that come from our vulnerability will most likely not be jeopardized. Immortality will not demand the vulnerable feature of human nature as its prize.

### *3.2 Will We Still Have Our Place in Nature?*

We learned that so-called “species-preservationists” fear human enhancement because they feel that there is something perilous about bending and transcending the boundaries of our evolutionary determined human nature. We next looked for a definition of this evolutionary take on human nature, and found it in E.O. Wilson’s work: “human nature is the inherited regularities of mental development common to our species”. In this section we will investigate whether this definition will still be applicable to us once we have extended our lives.

Where biological immortality is concerned, we must first look at the proposed genetic enhancements. Telomere extension seems at current to be the most promising method of genetically extending life, and is hypothesized to become of great use in combatting illnesses

associated with aging (Conger, 2015). It is doubtful, however, that these kinds of genetic modifications will translate to a change in either behaviour or in the inherited regularities of mental development; telomere extension simply makes cells act as though they were younger and divide more.

Furthermore, there does not seem to be anything to suggest that any of the other methods of biologically extending life - such as nanotechnology, synthetic biology, drug treatments and restricting caloric intake - will alter any of the inherited regularities. This is not to say that it is not possible - like with any other drug or treatment today - that there might be some unforeseen behavioural changes that occur as side-effects. Yet on the whole, it does not seem as if biological life extension will erase the inherited regularities of mental development that characterize the natural human.

Except, perhaps, for one: the production of offspring. In the off-chance that the link between infertility and life-extension will actually factor into future, we humans will have a choice: a long life without offspring, or a relatively shorter one with. In the previous section I discussed how such a choice would most likely lead to smaller generations, and not to the extinction of the human race. Here I would like to point out that even if the ability to have children is compromised, the inherited regularities of mental development that cause us to want to procreate will be left intact. After all, many humans today are infertile, and we do not consider them to be another species, or lacking in human nature, because of that. Nor do we call into question the human nature of those who refuse to have children and choose not to procreate even though they are biologically capable of it. Humans, after all, have more ‘answers to mortality’ – to borrow a phrase from the President’s Council – than just having children. We can leave behind a legacy of scientific prowess, of creative genius, of tactical brilliance. This is one of the differences between us and the rest of the natural world. Animals will never compose a symphony, write a philosophical thesis, or create a cure, and they certainly will not be remembered for it long after they are gone.

However, who will be left to remember us when we all decide to choose biological immortality above having children? We have already established that no form of immortality can truly extend our life forever. Therefore, once the last human dies, all of the meaning we have attributed, all of the love that we shared and all of the discoveries we have made will simultaneously be extinguished.

Biological life extension might not endanger the aspect of human nature that is our place besides other organisms. For we will still maintain our bipolar nature and our inherited regularities, up to and including the desire to procreate. However, since biological life

extension might make us infertile and therefore eventually lead to the complete disappearance of humanity, and since human nature cannot exist if there are no humans, we can only state that human nature will not be compromised by biological life extension if we are certain that the link between biological life extension and infertility has been dissolved.

Where robotic life extension is concerned, it at first seems obvious that we would abandon our place in nature because we will replace our current form, which is the consequence of a long evolutionary history, with a form of our own design. However, the brain that is transplanted or the mind that is uploaded will have to bear a great resemblance to its biological counterpart, lest personal identity be completely obliterated. Therefore, it stands to reason that the inherited regularities of mental development will be transferred as well. We will still be predisposed to, for instance, fear snakes and be disgusted by incest, and to attribute better qualities to members of our own group. Assuming, once again, that we will still be able to feel such things as fear, disgust and togetherness; to have emotions.

If the ANS substitute necessary to maintain our current emotional experience can be designed, then we will, despite our outward appearance, still mostly classify as a natural human. Our mind will still be predisposed to look at the world through the lens of the inherited regularities, with all the fear and disgust that comes with it, no matter where it has its seat. We will still be a bipolar species, torn between altruism and selfishness. And, just as with biological immortality, we will seemingly be forced to choose between extending our own lives or creating new life.

For where there might be a link between biological life extension and infertility, it appears wholly impossible for a robotic body to procreate. This new form will not be composed of cells containing DNA, but of durable, advanced, non-biological tissue. And I for one find it difficult to imagine how such a body could ever produce semen or have a fully-functioning womb. Remember, the intention of the Avatar project was to transplant a brain or upload consciousness, nothing more. I have added the ANS-substitute to this ambition, because I believe such an invention is required for our lives to feel similar, and because I can see it being manufactured on the basis of our already present knowledge of and experience with BCIs. But BCIs merely transfer and communicate nerve signals, they do not create life.

Only two options for procreation remain: to remain biological until you have born the desired number of children, or to harvest semen and eggs from our discarded biological husks and create children in an artificial womb. The image that comes to my mind immediately upon writing these words is that of the first chapters of Aldous Huxley's *Brave New World*

(1932), where society has departed from the natural way of having children in favour of creating genetic stratification through artificial means.

It appears we run into a problem here. On the one hand, we have this definition of human nature from an evolutionary perspective: “the inherited regularities of mental development common to our species.” A definition, moreover, which does not seem to be at odds with a robotic existence. Our biological brains will either wholly be transplanted, or copied at high fidelity after all. The inherited regularities shall therefore most likely be preserved. Yet on the other hand we have this description of a world without procreation between men and women. A world where human beings may look like everything and anything, but will have shed the evolutionarily moulded biological form that has been our home for so long. Can human nature exist within a being that does not look like a human, that is much stronger than a human, and that is incapable of procreating like a human? Is such a being still part of the natural world?

The answer we must give is: yes, it is, as long as the inherited regularities of mental development are still the basis of this robotic immortal’s experience, judgement, behaviour and representation of the world. If this being still wishes to protect that which it loves, if it still fears and dreams, then our human nature, which here is hypothesized to be a product of evolution, has been passed on. We cannot draw any other conclusion based upon the definition of the natural human that we discovered in Wilson’s work. At the same time, I cannot deny that it seems rather counterintuitive to call a mechanical bird a human being, simply because its inner world is still the product of our shared evolutionary past.

Yet perhaps there is a reason why it is so difficult to find a satisfactory answer to this question. After all, we have been arguing about the solution to this paradox for two millennia:

*“The ship wherein Theseus and the youth of Athens returned had thirty oars, and was preserved by the Athenians down even to the time of Demetrius Phalereus, for they took away the old planks as they decayed, putting in new and stronger timber in their place, insomuch that this ship became a standing example among the philosophers, for the logical question of things that grow; one side holding that the ship remained the same, and the other contending that it was not the same.”* (Plutarch, 75, translated by John Dryden)

Although several philosophers have naturally tried to resolve this paradox, none of them has done this in a way as to silence all opposition. The truth is that we still do not know whether the ship that the Athenians preserved is Theseus’ ship, in the same way that we will

not be able to conclusively decide whether the robotic immortal is still a natural human. Therefore I can only reiterate my conclusion: if it is true that the inherited regularities of mental development are human nature, and if it is also true that robotic immortals will still have these inherited regularities of mental development, then it must also be true that robotic immortals will still have human nature.

### *3.3 Will We Still Be Social?*

So far, we have addressed two of the fears concerning the influence of human enhancement on human nature. We focussed only on life-extending enhancements, and have concluded these will not endanger our vulnerability, nor the evolutionary determined part of our human nature, even if we exchange our biological bodies for robotic ones. We now turn to the final feature of human nature that is believed to be endangered by human enhancement: our social nature, which was defined as: “a complex nexus of interpersonal commitments and hierarchical structures.” Will we still be in competition with and committed to one another once our lives have been extended?

First, we will discuss our commitments to one another, and answer the question I posed at the end of section 2.3.1: whether life-extension is morally permissible as an *ex ante* enhancement, and whether it will negatively impact the human role of ‘associate duty-bearer’.

The problem we immediately encounter is that the science and technology behind life-extension as I described them in the first chapter did not include any *ex-ante* enhancements. There are no plans, that I know of, to alter an unborn child’s genetics in order to make it live longer. Even if we, for argument’s sake, assume that there are, we can only reply with Liao’s own conclusion: *ex-ante* enhancements are permissible as long as the agent who forces these changes upon an unborn child has morally just motives. Therefore, it would be wrong if these agents plan to create a breed of nearly indestructible soldiers bound to their will, and right if they simply wish to give a child the healthiest life they can, without expecting to receive any kind of advantages for themselves. I do not believe that there is more I can say about this question, other than to express the hope that our motives for implementing any kind of human enhancement will always be pure.

Contrary to the first question, the question of whether we will still act as ‘associate duty bearers’ once our lives have been extended deserves a more elaborate answer. Recall that granting human beings certain rights also automatically gives rise to corresponding

duties. If a child has a right to be loved, someone has the duty to love it; if a human has a right not to starve, then another has the duty to provide him with nourishment, etcetera. We, as humans, are committed to one another.

Although nations and individuals differ in the amount of rights they believe their fellow humans to be worthy of, we have agreed to try and act in accordance with the Universal Declaration of Human Rights (UDHR). This document was written by representatives from many different countries in 1948, and contains 30 articles which ought to be universally protected (United Nations website, 2017). Therefore, if we wish to answer the question whether humans who have undergone life-extending enhancements will still act as associate duty-bearers, we could perhaps do so by answering the more concrete question of whether or not they will still fulfil the duties put forth in the UDHR. Will these ‘immortals’ still help their fellow human beings, enhanced or otherwise?

This leaves us with two possible futures: one in which we, once enhanced, stay true to the UDHR and fulfil the corresponding duties, and one in which we violate it. I will discuss both.

In the future that adheres to the UDHR, everyone, no matter their wealth, will be allowed to extend their lives. For it is stated in Article 27(1) that: “everyone has the right ... to share in scientific advancement and its benefits” (United Nations website, 2017). If our scientific advances allow us to postpone or even eradicate aging, then this right would ensure that everyone can share in this discovery. Other Articles such as 3 – right to life, liberty and security – and 25 – right to a healthy life – also impose upon us the duties to offer life-extending enhancements to everyone who wants them. But whose duty is it to ensure that this probably incredibly expensive right is heeded? If it is the government's duty, then taxes will soar. If it is the citizens’ duty, then the cost of health insurance will rise significantly.

At first glance there seems to be a solution to this huge financial problem. For if people live longer, healthier lives, then they will also spend more years contributing to health-insurance and their nation’s treasury – assuming that they retire at a later age than we do now. At second glance, however, we also have to consider that longer lives will likely lead to overpopulation, which will lead to scarcer – and therefore more expensive – resources. As such it appears mightily difficult to reconcile the cost of life-extending enhancements with the right of every human to share in scientific advancements.

Another problem arises when we consider that some humans might wish to stay as they are now and refuse to extend their lives. There seems to be a good chance that they will find it ever more difficult to stay employed, considering that employers would rather hire

individuals who do not age as quickly, and are therefore less likely to suffer from age-related diseases. In this case it becomes difficult to protect Article 25 – the right to work – and we will see a rise in unemployment for unenhanced humans, making the whole enhancement-endeavour even more expensive.

Still, we could decide to bear all these financial burdens as a society, in order to ensure that the UDHR is heeded. To simply assume that we will not, would make us guilty of social determinism, as Julian Savulescu points out in response to Bill McKibben’s criticism of enhancement:

*“McKibben argues that enhancement should not be permitted because it will be used to increase inequality: enhancement technologies will be available primarily to the wealthy, and so the rich get richer, the rich get smarter, the smarter get smarter, and the smarter get richer.*

*However, this is not necessary and assumes social determinism. It is possible to use enhancement to increase inequality, but it is not a necessary outcome of enhancement. We have free will and a sense of responsibility; it is up to us how we choose to use this technology” (Savulescu, 2009, p.185).*

However, I am not completely convinced that we will choose to use human enhancement in righteous ways. There is a second, bleaker future that remains open to us, one that seems to be a more natural continuation of the current situation than the first. For the thirty articles in the UDHR are constantly being violated already. Slavery still exists, individuals are still persecuted for their beliefs, and the rich still profit far more from society’s progress than do the poor. And though we may have stated with such conviction that everyone has the “right to life” in Article 3, we have let people starve to death simply because they were born on a poorer continent than us. We carved out these thirty basic human rights, but have shirked the duties that were simultaneously called into existence.

Therefore, it seems plausible that human enhancement will be the next form of scientific advancement that is available, at first, only to the wealthiest. The rest of us, no matter how hard we worked, how much we contributed to society, or how righteous we lived, will be left to die to the diseases that accompany aging. The proof I have for this statement is that it currently costs 3 million dollars to be included into the Avatar-program discussed in the first chapter (2045.com). If this program is a success, then the first wave of wealthy ‘immortals’ will arise in 2020.

And then what? Perhaps experience, automation or public outrage will bring down the price for the next group who wants to transplant their brains into a robotic body. But just as there are still people without access to internet today, so there will always remain a group of unenhanced mortals, who by the simple law that employers would prefer people who are less prone to illness and disability, will find it more and more difficult to find a job to pay for their desired enhancements. This is a slippery slope, one which other authors have commented on as well:

*“Yet if human enhancement technologies develop as predicted, they can afford us a tremendous advantage in life; e.g., over others in a competition for resources, so much so that it overstretches the natural range of equality to the point where inequality becomes a more salient issue. This is where the gap between enhanced and unenhanced persons may be too wide to bridge, making the latter into dinosaurs in a hypercompetitive world... Since the others are now at a relative disadvantage, this may further impoverish the unenhanced, which may limit their access to such things as healthcare, legal representation, political influence, and so on”* (Allhoff, Lin & Steinberg, 2010, p.206-207).

It appears that our discussion of the first half of humanity’s social nature, our role as associate-duty bearers, has surreptitiously guided us towards its second half: our competitiveness. Before we let it take us any further, however, I suggest that we first try to answer the question of whether those who have received life-extending enhancements will still be committed to their fellow (post-)humans.

I cannot predict how fair or unfair our future will be. Human enhancement might be the next luxury product that is available only to the rich, but it may also be a tool to elevate individuals for whom it is now impossible to live a good life. We could transplant a quadriplegic’s brain into a robotic body, for instance, giving him the ability to feel and move again. Or we could demand that he pays us several million dollars first. It is up to us.

To those who fear that human enhancement will eradicate our social commitments to one another, I can therefore only reply: it will if you let it, but if you guide it in the right direction, then there is no need to fear. I therefore align myself with Julian Savulescu in stating that we can use human enhancement in righteous ways if we make an effort to do so. There is no logical ground for the assumption that life-extension will automatically make us less committed to one another than we already are. In fact, all that it does is exaggerate the current situation in which universal human rights are already being violated.



Furthermore, the conclusions from the previous two sections revealed that we will not lose our vulnerability, nor our evolutionary determined mental regularities. Because we will remain vulnerable, we will still need each other to survive, which makes it even more likely that our commitments to each other will not suddenly vanish. Our inherited regularities also make us predisposed to cooperate, at least as much as they predispose us to be selfish. Putting all the pieces together, I therefore conclude that life extension will not endanger our commitments to one another. The first half of our social nature appears to be safeguarded.

The social aspect of human nature does not only refer to the fact that we assist each other, however. We also compete with one another. We already discussed why life-extension, or any enhancement for that matter, can both be used as a means to help others and as a means to make ourselves better than others. But in doing so, we might turn into something that no longer possesses a human nature, at least according to many bio-conservatives. We would then be classified as a subhuman, superhuman or inhuman, as we discussed in section 2.3.2.

However, does having superhuman abilities of regeneration and vitality truly remove human nature from a biological immortal? No, for the simple reason that to state the opposite would be to fall victim to the naturalistic fallacy. Simply because it has always been the case that humans inhabited aging, illness-prone bodies, does not mean that we will cease to be human if we become stronger. The naturalistic fallacy is a lot like the status-quo bias discussed earlier: we have a preference for the familiar for no other reason than that it what we are used to. A change in our life-expectancy might be unfamiliar territory, but what ground is there to state that this should then also automatically lead to the disappearance of human nature?

If we truly wish to know whether life-extension will eradicate the competitive side of human nature, we should therefore not concern ourselves with labels such as superhuman. Rather, we should ask whether these enhancements will extinguish the spirit of sport, as Juengst suggests. The spirit of sport is a celebration of genetic diversity and of the hierarchical structures that emerge when competition occurs. The lucky ones, whom nature favoured, achieve success at the cost of their competitors. This is true for sports, but also for academics, love, the business-world, and in fact all social spheres, for where there are humans, there is also always competition between them. However, bio-conservatives state that once this unfair distribution of talents and looks is no longer due to the genetic lottery, but due to human enhancement, then the spirit of sport is bound to be extinguished. But will it in the case of solely life-extending enhancements? I would argue not.

Extending one's life by biological means will not suddenly cure me of my clumsiness, after all. Let alone make me a great athlete. What it can do, however, is allow athletes to compete at the highest level for longer than they can now. Slowing the rate at which Michael Phelps' body ages will not alter the fact that he was genetically gifted with double-jointed ankles, which gives him his distinct advantage in the water. Nor can it grant such a genetic quirk to someone who was born with normal ankles. The only impact that biological life-extension has on the world of sports is to keep athletes in it for longer. That is, until they lose the willpower and determination to keep competing at the highest level, traits that are also consequences of winning the genetic lottery, I would argue.

What about robotic life-extension, however? Things get more complicated here. Let's stay with Michael Phelps as our example for a little longer. If he allows his brain to be transplanted into a robotic body, he will lose his advantage over others. After all, he will no longer have double-jointed ankles. However, will he lose all that made him a successful athlete? Assuming his mental traits are left intact, he will still outperform most of us when it comes to determination, discipline, and the drive to not only compete, but to be the best. Where I might use these extra years of life to read and write, he would instead be predisposed to use it to compete in the first space-Olympics. Because he is an athlete, through and through, and I am not. If this is true, then we will still be celebrating the genetic diversity caused by the genetic lottery, because nature endowed him with a stronger competitive drive and more willpower than others.

However, what if bionic Michael Phelps encounters a man at the space-Olympics who is the laziest person he has ever met, who has no drive or discipline, but who defeats him at every turn because his bionic body is simply technologically superior in every way? This then would have to be the moment that the spirit of sport is truly extinguished, right? Perhaps, though perhaps one could argue that it was merely relocated. From the athlete to the designer of their body, from willpower to ingenuity, from one gift of nature onto the next.

I admit that many would disagree and state that the spirit of sport will be lost to us at this point. The spirit of sport was after all defined as the celebration of genetic diversity created by the natural lottery, and of the hierarchy of human excellence that flows from competition between athletes. As soon as we inhabit robotic bodies, many parts of this definition are indeed compromised. For instance, we will also have to factor in the technological diversity created by the natural lottery, or, in other words, the difference in the designer's ingenuity. Competition will no longer solely occur between athletes, therefore, but also between these designers. And instead of solely celebrating human excellence, we will

also celebrate technological excellence, it seems. This can be compared to the way we currently look at Formula 1 racing, where we both laurel the race car driver and the team of engineers and designers behind him. Interestingly, race car driving has never been an official Olympic sport.

Therefore, I concede that robotic life extension will extinguish the spirit of sport as we know it. We will no longer celebrate a stratification that is solely a consequence of the genetic lottery. Every athlete will be like a race car driver, their hierarchical standing partially determined by genetic factors such as the speed of their reflexes and their determination, and partially by technological factors.

Yet even if the spirit of sport stands to be extinguished by robotic life extension, does this then automatically also mean that the competitive side of human nature is also eradicated? I don't believe it does. Our competitiveness appears to be a consequence of our evolutionary past, where survival often hinged on our ability to defeat our competitors in the struggle for resources, love, and so on. Since we have already seen that mental regularities such as these will be left intact, even in the case of robotic immortality, it stands to reason that we will continue to be competitive. Therefore I conclude that the social feature of human nature will not be jeopardized by life-extension. Instead I propose that human enhancement itself is just another arena in which we as a species can only survive if we simultaneously work together, and use competition as a means to push ourselves to even greater heights.

### *3.4 Verdict*

Although we discovered that using human nature as an argument either in favour or against human enhancement meant to fall prey to the naturalistic fallacy, we have still attempted to assess whether life extension endangers three features of human nature. It appears as though neither biological nor robotic life extension will eradicate our vulnerability, our place in nature, or our social side. Humans will remain fragile creatures that simultaneously assist and compete with one another, and behave in ways prescribed by our evolutionary past. No matter if our outward appearance is that of the eternally youthful or of the distinctly robotic.

Yet in order to assess whether there was any merit to these fears for our human nature, we were forced to make the assumption that human nature does indeed have essential features. For argument's sake we pretended as though there was a list somewhere, detailing all the criteria individuals have to meet in order to call themselves 'human'. In the following chapter we will drop this assumption.

## Chapter IV

### Ever-changing Human Nature

In my view, the Wheel conceived by certain religions in Hindustan is much more plausible; on that Wheel, which has neither end nor beginning, each life is the effect of the previous life and engenderer of the next, yet no one life determines the whole.

*The Immortal*, Jorge Luis Borges, translated by Andrew Hurley

In the previous chapters we have interpreted human nature from an essentialist viewpoint. This means that we considered the human to have a fixed set of features, which, if threatened by some new technology such as human enhancement, will lead to the disappearance of human nature. However, there is another way to look at human nature, where no one essential feature determines the whole.

And it all begins, once again, with Prometheus. Recall that some proponents of human enhancement read the myth of Prometheus as a text that reveals another crucial characteristic that belongs to the essence of humanity: our will to mastery. We are a species that pursues knowledge and excellence, often at great cost. Contrary to this, we saw that some bio-conservatives interpret Prometheus' tale as a warning: if we are as hubristic as this Titan, and try to acquire more than what was gifted to us by Nature or God, then we risk our humanity. Yet these portrayals of humanity were quickly dismissed, because both of them suffer from the naturalistic fallacy, or, in other words, because both derive an 'ought' from an 'is'. In order to qualify as a human being you either ought to have the fierce desire to pursue extraordinary feats, or you ought to refrain from acting upon such desires. In truth, of course, humans come in all kinds, from those who accept themselves and the world as it appears given to them, to those who wish to change everything about it and themselves.

But there is a third way to interpret the myth of Prometheus. One that, rather than revealing some hardwired characteristic of humanity, instead shows us what it is we lack. This version can be found in Plato's *Protagoras*, and I will now paraphrase Stiegler's interpretation. When the Titan Epimetheus heard that his brother Prometheus had been tasked by Zeus with attributing qualities to all living beings, he immediately asked if he could do it in his stead. His brother agreed. Yet Epimetheus was the wrong man for the job. When he finally reached the humans, and plunged his arm into the sack that had contained all manner of attributes before, he discovered it had gone empty. There was nothing left to give to us; no claws or hides, no fangs or wings. We were helpless beings without any qualities in a world

full of danger, and Prometheus sought to remedy his brother's grave error. Therefore, he stole the fire from Mount Olympus, and gave it to the humans (Stiegler, 1998).

“And yet, whereas animals are positively endowed with qualities, it is *tekhné* that forms the lot of humans, and *tekhné* is prosthetic; that is, it is entirely artifice” (Stiegler, 1998, p. 193). We humans came into existence without claws or hides, with nothing but this prosthetic, stolen fire to compensate for our lack. We are beings without any intrinsic qualities, without an essence. Stiegler also refers to this as our *défaul d'origine*, a play on words that references both our original lack of qualities and Epimetheus' fault.

This interpretation of Prometheus' myth reveals another way of looking at human nature. Man is a prosthetic being, who requires technologies to compensate for his lack of qualities. We are never finished, and have no boundaries. Looking at human nature with the intention to unveil essential characteristics therefore seems a foolhardy task. For we are always changing, always becoming. It also suddenly becomes notoriously difficult to destroy human nature, for how do you destroy something that is inherently defined by its lack of qualities? Finally, this take on human nature appears to avoid the naturalistic fallacy completely, because it does not derive an ought from an is. There is no normative judgement hidden in Stiegler's definition of human nature.

One could take this view of human nature at face value and state that no technology could ever rid us of our nature, considering that it is through technology that the human always finds itself. But the human does not always encounter itself in its relationship with technology. Instead, technology often disrupts this very process of individuation, a term Stiegler borrowed from Gilbert Simondon, which refers to the processes in which we, individuals and societies become who we are (Stiegler, 2014, p. 87).

The human, to Stiegler, is not an entity 'present at hand' (to use Heidegger's terminology) but a process of individuation, in which three 'organ systems' constantly evolve – or co-individuate – in close interaction with one another (Lemmens, 2015). These three organs are the (i) biological organs, referring to our brains and bodies, the (ii) social organs, referring to our institutions such as schools and governments, and finally the (iii) technical organs, such as computers and cars. In becoming who we are, which is also referred to as our 'psychosocial individuation processes', we can either be assisted by these technical organs, or we can be hindered by them. An example of such an ill-adopted technological organ from our own time is the television. Rather than assisting individuals and societies in achieving goals they could not have imagined without its existence, it keeps our consciousness glued to a screen, silencing reason and instilling within us the desire to consume more and more.

Whenever a new technology is available, we always have to incorporate this into our individuation, which creates friction. This friction can be resolved when we *adopt* a new technology, meaning that we make it our own, understand how it works and learn to use it in ways that assist our goals. However, sometimes the friction is not resolved. This occurs when rather than adopting the technology, we *adapt to* it. We use it, yes, but do not understand it; do not make it our own. When we incorporate a new technology into our lives just because it is available and ready for consumption, without any idea of how it works or how it can help us pursue our goals, then this technology, rather than co-constituting the individuation processes, instead begins to disrupt them. This is called disindividuation (Stiegler, 2010).

These three organs – the biological, social and technological – might remind one of the three essential features from the previous chapters. Therefore, it is important to emphasize that they are not alike. To grant each organ a paragraph of its own like I did before with the three features would therefore be a severe misrepresentation. An essence is, after all, the opposite of a process because it is fixed, whereas a process is ever-changing. The three organs should not be looked at in isolation. Together they co-constitute the dynamic process that is the human. This relationship is not always harmonious and balanced, as discussed. Perhaps it would be if whenever mankind desired some kind of tool, it would simply appear, tailored to that one use only. But that is not the way technology works. Many inventions occur by accident, and almost every technique lends itself to more than the original intended use. Take for instance the discovery of nuclear fission, which opened up the possibility of the atomic bomb to end life, but also the possibility of nuclear reactors to produce the energy required to sustain life.

This double-edged nature of technology is reflected in Stiegler's term '*pharmakon*', an ancient Greek term that can both be translated as 'cure' and 'poison'. Every technology, including that of life-extending human enhancements, can be both helpful and detrimental to our individuation processes. We can therefore not easily state that because we now interpret the human as a being who makes up for his lack with technology, any and all technologies will do. Technology is not some cure-all, instead it is something we simultaneously desperately need to survive and something that can severely damage the ongoing process that is humanity. And with every new technological era, a period of tension invariably follows, in which both societal and psychosomatic individuation can be severely disrupted.

Interpreting human nature as a process of individuation rather than as an essence allows us a different vantage point from which to assess the dangers of human enhancement. After all, if we adapt to this new technology, then the psychosocial individuation processes

will continue to be subverted. However, if we choose to adopt human enhancement, and make it our own, then it will be far less poisonous.

I should mention that my portrayal of Stiegler's philosophy is but the tip of the iceberg, and a simplified version at that. Yet even if there were room to discuss all the complexities and details of his works, I would not include them. Because what I have explained so far is already almost sufficient to answer the question of whether life-extension will endanger human nature. Whether or not it will, all depends on our reaction to this new technology of life-extension. Will we adapt and be subverted by it, or will we adopt and be elevated by it?

#### *4.1 Adapting to Immortality*

What will it mean for the biological and social organs when humans suddenly start living far longer lives? How many memories will we lose over the long years? How many people will be selected to have to die, because we cannot afford immortality for all? A time of friction will arise, we can be sure of that. A tension that might never be resolved if we continuously adapt our brains and social organizations to this new technology of life-extension, without knowing exactly how and why we are doing so in the first place. I will offer a more concrete and lively example of this adaptation to life-extension a bit later on, but there is one key term which I must define before I can do so: proletarianisation.

Proletarianisation is a concept introduced by Marx which Stiegler imbues with additional meaning. For Stiegler proletarianisation refers to the phenomenon that we humans are losing our know-how, or *savoir-faire*, because we continuously externalize our knowledge, transferring it to inanimate technical organs like books and computers. The other side of proletarianisation refers to the phenomenon that we are also losing our knowledge on how to live, or *savoir-vivre*, because our desires have been conditioned by the capitalist industry. We no longer aim to pursue individual milestones on the road to self-actualization and individuation, instead, we are longing for the newest episode of *Game of Thrones*, to be consumed passively in front of a screen. Our desires have been taken hostage by the consumer-industry in our current day and age.

It can be expected that as we progress farther into the future, we will be able to externalize more and more of our know-how to machines. Furthermore, our desires are unlikely to be freed from the tug of consumerism. So now let us see if we can come up with a concrete example of how the adaptation of life-extension might subvert individuation.

Imagine, if you will, a busy road in the middle of London a hundred years from now. Cars by now will be self-driving and electric, commercials will be holographic, and sidewalks will be filled with individuals who greatly resemble each other because everyone now has the same body. There isn't much of a choice, after all; the market for robotic immortality belongs to two companies who together monopolize the market, a bit like how Samsung and Apple currently seem to own the smart-phone market. The differences between you and the passer-by who nods at you will therefore be miniscule. You can tell by his purple metallic gleam that he preferred the seamless integration between himself and his home entertainment system over the quicker processor and larger working memory you chose.

You wonder, looking up at the holographic robotic face of a model that looks exactly like your own, why you did it. Why did you allow some docbots to scoop your brain from your skull and place it within this body that you don't recognize when you look into the mirror? You wanted to live a longer life, you reaffirm yourself, and yet you cannot deny this irksome twitch of unease in the region where your intestines used to be, unaware that you can only feel this because some philosophy student once argued in favour of an ANS-substitute.

A chiming sound stirs you from your reverie. *A once in a life-time offer! Order your mental holiday now and get an extra week for free! Bliss awaits your mental signature.* You grumpily delete the commercial that seems to pop up inside of your mind whenever you start to have misgivings. Instead you let yourself be distracted by the latest episode of the third rework of *Game of Thrones*, this time with a fully robotic cast. You saunter towards work, letting your built-in navigation system guide you, as unaware of your surroundings as the cars that buzz silently past, and with just as little conscious thought going on inside.

It is not until the ending credits begin that you realize your body stopped moving. This is odd, considering how you're still a ways off from your work at the local repurposing yard, where dead robotic bodies are reassembled into new bodies for the masses of biological humans that cannot yet afford to upgrade. Perhaps you have these recurring doubts because you work here, where you constantly see the proof that the slogan: *'Immortality! Take it! It's yours!'* should not have convinced you to upgrade.

You try to move one leg forward, but it just won't budge. You start to panic, feeling trapped in this motionless hunk of metal, again unaware that you have some philosophy student to blame for this visceral response. Luckily, they told you what to do in such a situation during orientation hour: stay calm and call for help. A mental image of a smiling paperclip pops up and tells you a repairbot will be by shortly. Since there is nothing to do but wait for the tiny drone to arrive and fix you, you watch another episode, vaguely wondering



what would happen if all repairbots were to break. No human alive has the knowledge to fix another's robotic form anymore. But surely, they have repairbots to fix repairbots as well, right?

What I have tried to show in this illustration is that if we ourselves do not know how brain-transplants or biological enhancements actually work, that we then can never hope to make them work *for* us. We will instead be adapting, consuming, and as such will never truly make immortality our own. Instead we will be beholden to it: our brains and minds at its mercy, our social institutions at its beck and call. Like the protagonist of the futuristic example, we will be hopeless nitwits when it comes to knowledge over our own bodies, and powerless fools when it comes to the state of society. The capitalist industry will be in control like it is today, which means no-one truly is. Led astray by our desires to consume whatever is offered, we might indeed still become near-immortals, but we will be the most powerless, inauthentic generation the world has ever known. And we will be here to stay.

The capitalist industry meanwhile will rejoice, for not only will its richest customers live longer and therefore consume more, but the poor masses will also take all that they can get. They will buy Rapamicyn like we now buy vitamin-C pills, and see their desires fulfilled when newer and cheaper life-extending product arrive in their local pharmacy. Will any of these individuals, who now on average live longer than they would have normally done, actually be happier? Will their lives feel more authentic? Or will they just experience the same malaise that hallmarks our current day and age, where we have lost our story, have relinquished agency of our desires? Nothing will truly change, it seems. They will also be just as likely to fill their consciousness with television shows and commercials, leaving no room for independent thought or desire, ensuring that they will remain consumers, like we are now, only for much longer.

This is the price of adapting to life-extending enhancements. Our individuation processes will remain subverted, and the human, as a process, will continue to disindividuate. Life-extending technology will not simultaneously drive and be driven by human imagination and ambition. Instead it will become a tool that prevents us from living authentic lives and designing a better society. Rather than individuate, humanity will continue to be characterized by standardized lives, that appear pre-formatted and heteronoumously directed. Which, to me, sounds like a far more terrifying price for humanity to pay for immortality, than the chance of losing some feature of an essence that might not even exist.

## 4.2 Adopting Immortality

“There is always hope” my brain automatically supplies after writing that last paragraph. Perhaps it was placed there by the numerous series and movies that I have docilely consumed in my life, perhaps it is a far more ancient, powerful force at the core of what it means to be human. But are my thoughts telling the truth? Do we still have a chance to individuate, not despite immortality, but because of it? Can we adopt life-extending enhancements, rather than adapt to them?

Adoption refers to the imaginative appropriation of technical innovations, and the invention of new forms of individual and collective existence on the basis thereof, as explained by Pieter Lemmens in the prologue of the Dutch translation of *Philosopher par accident* (2014). I shall suggest several changes we could make in order to adopt immortality, but I want to emphasize that to truly counteract disindividuation, every individual and society should find their own creative ways of existing on the basis of this new technology.

Step one has to be aimed at counteracting proletarianisation. But how do we ween our consciousness off the products it has been consuming with such voracious appetite, whilst simultaneously re-internalizing the lost know-how? We could achieve this through education. Education can counteract a market-driven, consumer-oriented implementation of life-extending technologies, because it counteracts one half of proletarianisation – it returns our lost *savoir-faire*. In biology-class we will be taught about what aging is and what is done to counteract it; how genetic engineering works and its ethical dilemmas. In IT-class we will not only be taught how to program, but also how BCI’s work, and what happens when they fail. All of this could be achieved in high school and would help us to regain our lost know-how.

Older humans will have to seek out this information for themselves, because, and here is the kicker: you will have to pass an exam on life-extension before you have access to the enhancements themselves. This begs for some kind of impartial social institution to be created which oversees education on life-extension, takes the exams, and hands out certificates to those who pass them. Much like a driver’s licence. This also counteracts the proletarianisation of our *savoir-faire*. After all, we will have to study to fulfil our personal desire of becoming immortal. Which is a stark contrast to the situation today, when we only have to turn on the television or computer to fulfil our conditioned desire of consuming audio-visual temporal objects (Stiegler, 2014). Future humans will have to choose between the instant gratification of watching another soap-opera and the delayed benefits of studying.

Now let us try to imagine which kinds of people will take this exam with another goal in mind than merely to live longer; those individuals who will use this new technology to achieve goals that are currently unattainable without life-extension. The first category that comes to mind are loving parents, who wish to have more time with their children. To be there not only to watch their grandchildren grow up, but their great-great-grandchildren as well. These individuals will adopt immortality as the means to an end: they want to live longer so they can love longer.

The second category that will take the exam with another goal in mind than simply living longer will be the academics, who want to have more time in which to gain more knowledge. Philosophers, who want to see whether several centuries of existence give one new insights into the true nature of being. Physicists, who want to occupy more than one single step on the ladder to uncovering the secrets of the universe. Neuroscientists, who wish to know how much of a biological brain can be replaced by cybernetic parts before consciousness and identity start to unravel.

The third category of people who will choose life-extension will be the dictators and tyrants who want to stay in power for longer. This would be a worst-case scenario for humanity's ambition to ensure that human rights are heeded internationally, but there might be a solution. So far we have only discussed individual adoption of life-enhancement after all.

Societal adoption might arise when we begin to vote for representatives who are great-great-grandparents, based on the assumption that they will do right by every generation. These government officials might furthermore be assisted by the long-lived academics, who will know more about topics like economy and climate-change than any advisor alive today. Their love and knowledge will hopefully translate to a kind and wise government, though I admit this might also be a naïve dream of mine. But if these new kinds of governments, who take the fate of every generation to heart and who have access to the knowledge required to improve those fates, are successful, then other nation's citizens will demand a similar form of governance. Including those who are terrorized by long-lived dictators.

In the end, adopting immortality on an individual level means using this new technology as a means to an end; to pursue your own goals or to discover new ambitions that would have been impossible before life-extension became available. I have mentioned but a few. This is completely different from consuming life-extending enhancements just because that is what our consumption-driven mind-set tells us to do. Similarly, societies can either chase after the myriad of social disruptions caused by longer-lived humans, or make full use of the new possibilities that open up once lives begin to stretch across the centuries.

### 4.3 *The Immortal Human Process*

Human nature, from a Stieglerian point of view, is a dynamic process between the biological, social and technical organs. It is never finished, and is constantly becoming what it is. This individuation process can be subverted by technological organs. This does not mean that technology can somehow eradicate humanity itself, because it is always an integral part of it. The subversion means that humanity cannot become what it is, because it is forced to adapt to new technologies.

We have seen how detrimental this subversion can be in our own time, which is marked by far-reaching proletarianisation. Our current technologies have not elevated us, instead they have subverted us. We have lost our *savoir-faire*, because we feel comfortable with entrusting all of our knowledge to computers and forgetting it for ourselves. We have also lost our *savoir-vivre*, because we seem to have forgotten how to think and desire for ourselves. This is partly the fault of so the so-called ‘audio-visual temporal objects’ that I mentioned before. These include every media-broadcast, from radio, to television, to YouTube-videos. The consequence of watching and listening to these broadcasts is that our consciousness, which we ought to be using to set goals and individuate ourselves, is synchronized with the messages of the capitalistic economy. This allows the capitalistic industry to condition individuals into adopting those behaviours that improve consumption (Stiegler, 2014), and prevents individuals from thinking and dreaming for themselves.

So what does this mean for the main question of whether life-extension will harm humanity? Because life-extension is a technology, it is bound to have both toxic and curative effects. In and of itself it is therefore not able to eradicate humanity. Even if we completely adapt to this new technology, we will not lose our humanity, because that would mean that we humans today have also already lost our humanity. However, if we instead learn to adopt life-extension, make it our own, make it work for us so we can achieve our own goals or even pursue goals that we never could have dreamed of without extended life-spans, then humanity will be able to individuate itself far more and in new and different ways than it is able to today.

Take the internet, for example. Through it we have easier access to information and data than any generation before us, and some of us use this to educate ourselves in ways that would have been impossible before the advent of the internet, whilst others, incredibly, use it to look at pictures of cats. Life-extension will open up new possibilities, like the internet did, but it remains up to the humans who use these technologies to determine whether they will be

adapting to it, or whether they will use it for their own goals. Or, in other words, whether they will feel forced to remodel their lives and ambitions to fit this new technology, or whether they will mould this new technology with great authenticity to fit individual and societal needs and dreams.

Finally, I must mention that Stiegler proposes – echoing Heidegger whom he is greatly influenced by – that the possibility of death itself is a necessary condition for human nature to exist. Because we are mortal, we are never finished. And not being finished is what hallmarks the human. Death is always there, lurking in the distance, which forces us to imbue our lives with authentic meaning, to become a ‘Sein-zum-Tode’ as Heidegger puts it, which translates as ‘being-toward-death’. I would be remiss to exclude this proposition from a thesis that links Stiegler to immortality, but I also believe that there is no danger of the ‘Sein-zum-Tode’ disappearing anytime soon. For, as I have mentioned several times before, life-extension cannot make us truly immortal. Even if we never fall prey to accidents, infections and mutations, then we still will not be able to reverse entropy. We may live for far longer, but never forever.

To summarize, if we do not try to keep the toxic effects of life-extension to a bare minimum, we will risk entering the next era of disindividuation. We ought to take a long hard look at the situation today, at the knowledge we have discarded and at the consumerism that has enslaved our desires, and do our utmost to ensure that humanity has a future in which it has a chance to become what it is. Whatever that might be.

## Conclusion

Harry, there is never a perfect answer in this messy, emotional world. Perfection is beyond the reach of humankind, beyond the reach of magic. In every shining moment of happiness is that drop of poison: the knowledge that pain will come again. Be honest to those you love, show your pain. To suffer is as human as to breathe.

*Harry Potter and the Cursed Child*, J.K. Rowling, John Tiffany & Jack Thorne.

In this thesis, I have replaced the concept of immortality with the more realistic option of life-extension. In the introduction I already emphasized that true immortality will never be attainable by humans. We can at best hope to extend our lives indefinitely, but never infinitely. I have attempted to assess the dangers of life-extension for human nature, so that when we do decide to cross that threshold, we will have a clearer understanding of what we will become.

However, it turned out that none of the three essential features of humanity stand to be completely eradicated by life extension; we will remain vulnerable, social creatures who are part of the natural world. Certainly, as long as the Theseus-ship-paradox remains unresolved, it will remain up for debate whether a robotic bird can be called a human. Whether or not the spirit of sport can survive is also left open for interpretation. But on the whole, we can state that most of the bio-conservative fears were shown to be unfounded. I personally believe this is partially due to their tendency to conceive of human-enhancement as some magical spell that will suddenly turn humans into immortal gods that are smarter than Einstein and nimbler than Phelps. This is why I decided to base my assessment of the dangers of life-extension on the currently available scientific and technological knowledge, and not on the opaque concept of immortality.

Along the way, I also discovered that both transhumanists and bio-conservatives occasionally fall victim to naturalistic fallacies and status quo biases. The tendency to prefer what is over what could be is understandable. It is a base human instinct to prefer the familiar after all, but we should always attempt to recognize these biases and correct them when performing any kind of philosophical analysis.

At the same time, however, an alternative take on human nature did reveal there is something to fear. It is not some hypothetical and possibly non-existent essence of humanity we should worry about losing, but the constant process of individuation we should refrain from harming further. Stiegler's interpretation of the human as an eternally unfinished being that requires technology to compensate for its lack showed that adopting a new technology

ought to be much preferred over adapting to it. We need only to turn on our televisions to see what happens to humanity when its behaviour and ambitions are no longer authentic, but rather informed by and aimed at goods that are ready for consumption. Who has time to enact positive social change today, if they can also scroll mindlessly past their Facebook-feed? Why have an independent thought when instead you can watch a YouTube video?

Therefore, what has struck me most during this long, meandering journey into the future of humanity is the desperate need for human beings to *act*. If we allow things to progress as they are now, then it is more than likely that life-extension will become a luxury product available only to the richest among us. If we do not reclaim our own desires, they will remain aimed at consumption, rather than at self-actualization, meaning we are more likely to adapt to life-extension, rather than adopt it. We have to move if we want to be the authors of our own fates, we have to think for ourselves, we need to be better than the inert consumers we have regressed into.

Today, humanity can still only gaze at dawn of a new time: the age of its own enhancement. Currently, scientific and technological barriers are keeping us locked in place. Motionlessly we stare, our eagerness only equalled by our hesitation. Because it seems obvious that if we rush towards it, we might stumble, fall, and rise as something we never wanted to be. Yet turning from it seems as pointless as trying to outrun the real sunrise. Therefore I reiterate: *we will never be here again*, in this moment in time, which we might squander or use to our benefit. For the most sensible thing that the academic world can do is illuminate the road ahead, hopefully ensuring that humanity gets to where it wants to be without either destroying itself or the things it holds dear along the way.

Do I think we can do it? Naturally I do, because I am human. I know we can change. Our weakness has always been the very thing that forces us to keep improving. Because death has always been and will always be inevitable, we humans fight to live. And it is exactly this tenaciousness of ours that makes us strong enough to survive anything.

Even immortality.

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