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Acceleration, Technology and Finitude
Redefining Mortality in the Horizon of Life Extension via Aging Intervention

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ABSTRACT

In this essay I intend to approach acceleration theory by exploring the tense relation between the dynamization of world-time and the finitude of life-time. But more importantly, I make this approach with an eye on a contemporary technoscientific phenomenon: the various projects of life extension via aging intervention. To which extent can we imagine an extended life, freed from the constraints of aging and frailty, as a relief to the accelerated modern subject? I proceed by providing a working definition and a conceptually reconstructed coherence for the distinct but converging actors that endorses life extension technologies in contemporaneity. I propose that the redefinition of aging as a disease constitute the common ground that unites them, according to which the history of longevity in modernity finds its ultimate barrier in the stiffness of the body – a barrier which life extension technologies must overcome. I argue that the struggle for liberating human life from the constraint of aging paradoxically favors an ethics of survival, according to which self-optimization and self-preservation constitute central values, reproducing, therefore, the cultural logic of acceleration.

Keywords: Acceleration, Life-time, Aging, Life extension, Aging intervention.

Aceleración, tecnología y finitud
La redefinición de la mortalidad en el horizonte de la prolongación de la vida mediante intervención en el envejecimiento

RESUMEN

En este ensayo pretendo abordar la teoría de la aceleración explorando la tensa relación entre la dinamización del tiempo del mundo y la finitud del tiempo de vida. Pero, sobre todo, hago esta aproximación con la mirada puesta en un fenómeno tecnocientífico contemporáneo: los diversos proyectos de prolongación de la vida mediante intervención en el envejecimiento. ¿Hasta qué punto podemos imaginar una vida prolongada, liberada de las limitaciones del envejecimiento y la fragilidad, como un alivio para el acelerado sujeto moderno? Procedo a una definición de trabajo y reconstruyo conceptualmente la coherencia entre los distintos pero convergentes actores que avalan las tecnologías de extensión de la vida en la contemporaneidad. Propongo que la redefinición del envejecimiento como enfermedad constituye el terreno común que los une, según el cual la historia de la longevidad en la modernidad encuentra su barrera definitiva en la rigidez del cuerpo, una barrera que las tecnologías de extensión de la vida deben superar. Sostengo que la lucha por liberar la vida humana de la rigidez del envejecimiento favorece paradójicamente una ética de la supervivencia, según la cual la auto-optimización y la autoconservación constituyen valores centrales, reproduciendo, por tanto, la lógica cultural de la aceleración.

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Palabras clave: Aceleración, Tiempo de vida, Envejecimiento, Prolongación de la vida, Intervención en el envejecimiento.

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INTRODUCTION: ACCELERATION AND FINITUDE

Urgency is certainly the utmost imperative of any form of life that is developed and led under the sign of acceleration. One can understand the imminent end of the world, the eschatological expectation of a shortening of the time that remains, as a compelling force of urgency. Nonetheless, apart from a growing sensation of imminent end that stems from horizons of ecological and nuclear catastrophe, modern social formations are not compelled by apocalyptic predictions. In modernity, as Hans Blumenberg (1986) discerned, the time of the world, or the world-time (*Weltzeit*), is indefinitely long and future is open and wide. If anything, the urgency that consumes modern forms of life –i.e., the feeling of time scarcity whose structural underpinning Hartmut Rosa (2005) sought to reveal in his acceleration theory– is foremostly linked not to the end of the world, but to the end of life. The end of a modern life-time (*Lebenszeit*), as Blumenberg would have it, is the main source of the existential sense of finitude; a finitude not attached to an all-encompassing apocalyptic precipitation, but to an unsurmountable divergence between an unbound world and a transitory life, constricted by birth and death.

Life-time and finitude acquire a particularly relevant status in modern philosophy as well, especially at the turn of the twentieth century. Michael Theunissen (1991) proposed that not only existential philosophy, but modern philosophy as such, rendered death an object portrayed exclusively from the perspective of the living. Once images of the beyond, or of the afterlife, became more and more impenetrable, death lost its collective meaning and was transformed into a privileged standpoint from which philosophers have been attempting to unveil the nature of human (individual) existence. The iconic example of such a move is Martin Heidegger's philosophy of existence, to which the conception of one's being in its temporal entirety (*zeitliches Ganzsein*) is only possible through the anticipation of one's own end (*Vorlauf zum Tode*). Heidegger's concern are the conditions under which human beings, or *Dasein*, are able to lead an 'authentic' life (cf. Wittwer, 2014, pp. 24-25). It is from this individualistic 'heroic' perspective that life-time is understood here as a problematic subject matter, especially for the reason Céline Lafontaine mentioned in the introduction to her monograph *The Postmortal Society*. "While the philosophical existentialism that marked the 20th century brought the question of finiteness into center stage", she says, this very same question now "gradually disappear from a philosophical, cultural and social horizon which renders death eventually a hidden, denied or, at least, senseless reality" (Lafontaine, 2010, p. 10). These

conjugated processes –the philosophical individualization of death and the disappearance of death from the collective horizon of modernity– can be grasped and synthetized by Rosa's acceleration theory.

In this essay, I would like to draw attention to a problem hinted at but not explored in Rosa's argument: the relation between social acceleration as the reproductive *modus operandi* of modern social formations and the existential question of human finitude. If anything, this problem acquires its intellectual interest by the simple fact, once noted by Max Weber, that a fundamental tension should arise between the logic of progress that governs the life of "civilized men" and the circumstance that this life has an end –for "the individual life of a civilized man, placed into an infinite 'progress', according to its own immanent meaning should never come to an end; for there is always a further step ahead of one who stands in the march of progress" (Weber, 1958) . Weber's portrayal of the tragic fate of modern individuals in their dealing with mortality is explicitly inspired by the rather idealistic, but instructive contrast Liev Tolstoy drew between the noblemen's fear of and the peasant's virtuous acceptance of death[1]. Nonetheless, by pointing out the fairly absurd character of human finitude in a world set for indefinite growth, Weber anticipated a theme that lies at the core of Rosa's acceleration theory. Weber's and Rosa's conceptualizations of the relation between individual life-time and the world-time point out to an intrinsic incongruence between modernity's ideal of good life as full life (*erfülltes Leben*) and the dramatic openness of modernity's realm of experience.

In acceleration theory, however, Rosa not only departs from the diagnosis of this incongruence but also claims that the cultural logic that governs acceleration, i.e., the "cultural promise of acceleration" is the idea that acceleration of the pace of life might be a strategy to suture the divergence between life-time and world-time. In other words, acceleration could also be considered a modern, cultural response to the problem of finitude.

> He who lives twice as fast is able to realize twice as many possibilities in this world, achieve twice as many goals, have twice as many experiences and collect twice as many lived events: he doubles the level of worldly options that can be explored. […] Yet, he who lives faster can, in a way, realize a variety of life projects in one single lifetime […] *He who becomes indefinitely fast no longer needs to fear the annihilator of options: death* (Rosa, 2005).

Using terms adopted by Rosa in his later work, not only he who lives indefinitely faster, but also, he who indefinitely increases his basis of resources (Rosa, 2016) or who indefinitely expands his range over the world (Rosa, 2018) can, presumably, cover the gap between the range of realizations in a life-time and the range of potentialities of the world-time. Rosa's critique of such an engagement with the finitude of life-time argues in two directions. Firstly, that the efforts presupposed in such an existential endeavor make it resemble a Sisyphean work. The implicit eudaemonic promise of acceleration fails to be realized by the fact that the world itself and its temporal horizon is indefinitely widened –and in a higher pace– by the compulsion to growth and innovation of a dynamically stabilized society. Secondly, that this strategy precipitates in an alienating form of

[1] Tolstoy's work to which Weber refers is probably the 1859 short story *Three Deaths*.

experiencing both the world and the self. A subject structurally compelled and culturally oriented by acceleration runs the risk of shutting down her sensibility and capacity to be touched, to touch, transform and be transformed by the world –i.e., she is no longer able to 'resonate' with the things, the people, and the cultural precipitations (art, religion, science etc.) that surround her (Rosa, 2016). And this relational silencing would also affect the relations we establish with our selves. If the strive for guaranteeing the widest possible margin of realizations in a life-time becomes a model of good life in modernity, it may paradoxically turn out to be an indefinite survival game. "In a way", he exemplifies, "we moderns resemble a painter who is forever concerned about improving his materials –the color and brushes, the air condition and lighting, the canvas and easel etc.– but never really starts to paint" (Rosa, 2017, p. 443).

After all, we could conclude with Rosa, it does not matter how much access to the world we might acquire, for ours is a finite time. While everything in our surrounding might accelerate, the allotted time for human life in this world, with small variations throughout times and spaces, remains ultimately constricted between birth and death. Therefore, a critique of the conceptions of good life should focus on how a certain form of existence responds, more or less successfully, to the problem of finitude, i.e., to the question of how to better use the scarce resource of life-time. But what if this allotted time could also be brought within the realm of technological control and submitted to the cultural logic of growth and acceleration? A fairly coherent web of actors, institutions, practices and discourses in contemporary biomedical and biotechnological research points precisely in this direction. From universities to biotech companies, the idea of technologically conquering human aging and prolonging it beyond the boundaries of the biologically possible is on the rise (Barazzetti, 2011; R. Binstock, 2004; R. H. Binstock, Fishman, & Juengst, 2006; Fishman, Binstock, & Lambrix, 2008; Knell & Weber, 2009; S. G. Post, 2004). Such projects are presented by their representants as a promise of liberation, as the opening up of possibilities for longer, healthier and more active forms of life. The delights of life without aging, wrote geneticist David Sinclair, are delights of a full, but decelerated life:

> What if we could play as children do, deeper into our lives, without worrying about moving on to things adults *have to do so* soon? What if all the things we need to compress into our teenage years didn't need to be so compressed after all? […] What if, in our 50s, we wanted to reinvent ourselves and couldn't think of a single reason why we shouldn't? What if, in our 60s, we weren't fretting about leaving a legacy but *beginning* one? (Sinclair, 2019)
>
> When will this happen? It's already happening. It is not fanciful to say that if you are reading these words, you are likely to benefit from this revolution; you will look younger, act younger, and *be* younger –both physically and mentally. You will live longer, and those extra years will be better (Ibid. pp. 208-9)

What if the naturally given, evolutionarily determined durability of human life could no longer be held as an unsurmountable limit, but rather as a flaw, a diseaseful condition susceptible to correction and amelioration? Would not a longer life, unbound from any pre-established limits and furnished with greater vitality, be a relief to the accelerated subject? Or would such a form of

existence only represent a step further in the direction of alienation, only enlarging the scope of life under the grip of acceleration and compulsion to growth?

In this occasion, I would like to revisit acceleration theory and the tension between acceleration and finitude with an eye on this very particular contemporary technoscientific project which I propose to call *life extension via aging intervention* (LEVAI). But how do I approximate this particular technoscientific phenomenon to the tension between acceleration and finitude? First, I do not intend to explicate the intricated nature of the myriad networks, discourses and practices that constitute LEVAI by resorting to acceleration theory as a macro-theory capable of revealing the structural determinations of technoscience. The intersection of acceleration theory and LEVAI lies in basal attitude towards the temporal limits of life-time. Acceleration can be conceived of as a life strategy which seeks to amplify the limits of the feasible and experienceable within a life-time. LEVAI, on the other hand, departs from the promise of a technological conquest of the material, biological substrate that determinates human life-times in the last resort. As such, life extension projects produce an ideal of good life as an ageless form of existence. In the present work, I would like to approach this idealization of the future of human mortality by understanding it as a response to the divergence between acceleration and finitude. As I will argue, the emergence of such a technoscientific endeavor represents a particular interpretation of the relation between technological potential and human finitude, in which the aging body appears as the last barrier impeding a fuller and happier life. A question worth posing is whether such projects and the ideal of good life they portray can be conceived of as a genuine alternative to acceleration as life strategy or if it only brings the same logic to a higher level of radicality.

In the following, I will provide a working definition of LEVAI and explain why, despite of its various and even conflictive affiliations, it is an essentially transhumanistic endeavor (1). In the sequence, I will describe the relation between technological potentiality and human finitude according to the perspective opened up by LEVAI (2) and, therefore, how this perspective also projects a particular future for human mortality (3), in which a promise of liberation intertwines with an ethics of survival.

1. LIFE EXTENSION VIA AGING INTERVENTION

The idea that science and technology cannot only remediate human condition but also produce more perfected forms of human life is found already at the dawn of modernity. Descartes (cf. Gruman, 1966, p. 77) himself believed that, with increasing rationalization, human life would be indefinitely prolonged; so did social reformists such as Godwin and Condorcet (cf. Gruman, 1966, p. 85) too, to whom the idea of progress was intimately related to the indefinite conquest of human frailty, leading to unpredictable limits to lifespan (Boia, 2004; Gruman, 1966). Mark Adams (2004) demonstrated, for example, how the early history of modern biology is entertained by utopias of perfectibility and how early biologists such as J. B. S. Haldane (2002 [1923]) and Julian Huxley (1968) already envisioned a biologically enhanced humanity capable of living extraordinarily long lives. While, on the one hand, biology definitely became a leading science throughout the last century, especially after the consolidation of genetics and the industrial use of biotechnology (Bud, 1991; Krohs & Toepfer, 2005), the idea of rejuvenation and life extension, on the other, was relegated to

a backstage position of questionable science (R. Binstock, 2004; Gilleard Chris & Higgs Paul, 2016). Nonetheless, the dream of engineered immortality still lives on and has made its way into high-tech businesses. A most (in)famous example is found in the field of *cryonics*, a technique consisting of preserving human bodies in liquid nitrogen shortly after death (Farman, 2020). Facilities in the USA and Russia have been offering this service for some time now and many living persons have already assigned for having their bodies frozen with the hope of being awakened in the future when technology will be in the place to restore their lives. Another facet of technological immortalism in contemporaneity is the idea of *mind-uploading*, notoriously defended by Ray Kurzweil (1999), chief-engineer at Google, according to which the replication of a human self in a digital platform will enable a form of existence completely independent from the biological substrate.

If cryonics and mind-uploading remain foreign to mainstream science, the same cannot be said about the idea of life extension via aging intervention. At the intersection of regenerative medicine, biology of aging and the financial power of Silicon Valley investors, the field of aging intervention has grown in and outside academy as an endeavor worth of both scientific and economic investment. Many scientists working on the field from within mainstream academy would dispute that aging intervention could lead to radical changes in the natural human lifespan and emphatically disapprove of the commercial misuse of their work (S. Jay Olshansky, Hayflick, & Carnes, 2002), while others, as Aubrey de Grey, more tuned with Silicon Valley techno-utopic agenda, tend to be much less restrictive in their prognosis. de Grey is one of the most famous gurus of the life extension movement, frequently giving TED talks and publishing in academic and non-academic media and has already stated that the first person to live to 1000 years has already been born. He is the co-founder of SENS foundation, a research facility dedicated to developing and promoting anti-aging therapies based on regenerative medicine, but his approach tends to be criticized by other scientists as beyond the point of serious science. In mainstream academy, on the other hand, the research on aging and the prognosis of aging intervention are communicated in a much more careful manner, precisely in order to avoid a public association of their work with pseudo-science and the commercial charlatanism that used to revolve around the topic of rejuvenation (R. H. Binstock et al., 2006). Nonetheless, also the idea that in the future aging will become a medically ameliorable condition has conquered terrain.

Responsible for this optimism are theoretical and experimental advancements in the interdisciplinary field of biogerontology, which substantially transformed the scientific understanding of aging in the last decades, foremostly by contenting that aging is neither a genetically inevitable nor evolutionarily necessary phenomenon. In short, the promising future portrayed in biogerontology rests on a reconceptualization of biological aging as a plastic process and therefore susceptible to be brought within the realm of technological amelioration (Austad, 1997; Gems, 2009; Kirkwood, 1999). Furthermore, differing from the traditional approach of geriatrics, the procedures devised by biogerontological theory and experimentation assume that diseases associated to age should be understood rather as symptoms of an underlying pathological condition: aging itself. The success in extending the lifespan of model organisms –such as the nematode worm *Caenorhabditis elegans*, whose lifespan has been prolonged 10 times with the change in a single gene– through various experimental procedures has boosted the confidence of

both scientists and investors that conceiving of anti-aging therapies for humans is a realistic endeavor[2].

However, the controversies surrounding biogerontology and the aims it should pursue are huge, involving not only actors directly engaged in aging research but also a plethora of bioethicists, sociologists and ideologues defending or condemning the artificial extension of human life in a vivid public debate (Kass, 2003; Knell, 2018; S. G. Post, 2004; J. A. Vincent, 2009). But it is among aging researchers themselves that the definition of the scope of biogerontology, of what is realistic and expectable, of what is serious science or commercial hype, that the most heightened conflicts arise (Grey, 2005; S. Jay Olshansky et al., 2002). Therefore, a preliminary definition of the life extension idea in contemporary technoscience should consider its contentious nature. And as I propose to frame it, the contentious placement of aging intervention and its unclear affiliation to mainstream science or to the edges of technoscientific utopia stems, by its turn, from the extraordinary implications of transforming aging into a disease. If, as David Gems puts it, biogerontology cannot but understand aging as, "essentially, a form of genetic disease" (2009), one of the implications of it is the blurring of the lines that separates therapy and enhancement. The 'disease of aging' is no pathological counterpart to a given normality, i.e., as a category, it does not represent the malfunction of any state we could conceive of as standard or healthy, which therapeutic procedures are supposed to restore. After all, every human being ages. Therefore, devising treatments to halt, slow down or even reverse aging is an action of trespassing clear limits. While, on the one hand, the conquering of illnesses and poor conditions that accompany old age follows a fully standard logic of medical progress, on the other, the conceptualizing a form of existence freed from aging is already conceptualizing something other than human existence – different, at least, from the homo sapiens we have been for the last 200 thousand years. The question, therefore, whether aging intervention should count as mere progress in healthcare or as human enhancement is difficult to respond to because portraying aging as a disease entails a blurring of this boundary.

With these conditions in mind, I propose to conceptually reconstruct the core of these complex network by the vanishing point that ties all different agents together: the achievement of *life extension via aging intervention* (LEVAI). A discursive community underlies the action of these disparate agents: the conceptualization of aging as disease. Which, by its turn, points out to a particular interpretation of the relation between human finitude and technological potentiality. If aging can be seen as disease in religious contexts in which gods and other perfected beings represent a form of existence in relation to which human mortality is a sign of imperfection, it is difficult to identify what is the 'other' of humanity that provides biogerontology with the ideal reference in relation to which aging can be seen as a disease, too. But, in a sense, the belief that such an other exists, or is at least conceivable as a future possibility, is what gives LEVAI its inner coherence. While it is not possible to provide any description of such a future form of existence – for, so far, not a single aging intervention technology has come to life–, it is reasonable to interpret modern biotechnology's disclosure of life as an engineerable phenomenon, susceptible to

[2] It is worth noting, however, that many challenges lie between experimental procedures and actual therapy development, such as the capacity to translate results obtained in animal organisms to humans. See, e.g., Magalhães, Stevens, and Thornton (2017).

recombination and functional optimization, as the path that can lead to this other. If so, we could see in the other of the aging human implicit in LEVAI's discourse the decline of the concept of 'humanity' as the reference model for perfectibility and its substitution by the concept of 'life', a much more flexible and undetermined reference. As such, LEVAI's ultimate horizon would be part of what Karin Knorr-Cetina (2005) has termed the emergence of a "culture of life" in contemporary Western societies. In her account, the idea of human perfectibility that once oriented the notion of social and scientific progress to authors such as Condorcet or Rousseau has now given place to the idea of life perfectibility in scientific and practical discourses. In a way, the "disease of aging" could be therefore interpreted as the result of evaluating human organic, morphological and functional determinacies at light of the potentials contained in "life" as an evolutionarily and genetically open phenomenon, improvable and extendable (Moreira & Palladino, 2008).

This re-evaluation of the aging human existence at light of the potential other of an ageless existence is noticeable in the way the modern history of longevity is interpreted from biogerontology's perspective.

2. MODERNITY AND LONGEVITY

The insightful observation that Weber, Blumenberg and Rosa share regarding modern life-times point to the problem of temporal scarcity. The core idea here is that, in front of the vastness of present experience and the openness of future expectations no human being is able to die full of life. There is always something left unknown. Nonetheless, the diagnosis of this relative scarcity contrasts with another aspect of modern life-times; an aspect even more unique to modernity than the former: longevity.

From a demographic standpoint and in historically comparative terms, modern life-times are astonishingly long. We live longer and healthier lives than any other generation of our species could expect to do. In a bit more than one century ago, the average global life expectation at birth was about half of the contemporary; but if we look further into the past through the statistics, we will not see a declining line so steep as the one we see when we look from our present into the last century (Roser, Ortiz-Ospina, & and Ritchie, 2013). It does not mean, however, that old people who lived to their 70s, 80s or beyond did not exist before the Eifel Tower was erected. They did –but were quite a rare specimen. The abrupt increase in life expectation that industrialized but also developing nations have witnessed in the last century is a statistical representation of two main phenomena: first, a sharp reduction of deaths in the early life years of a population; second, the growth in the number of people who are still alive after the greying of their hair. The biogerontologist Tom Kirkwood demonstrates these changes by comparing two actuarial tables of survival patterns in England and Whales, in 1880 and 1990. Out of a million people who were born alive in this region in 1880, only 568,993 were alive by the age of 35. In 1990, the number of people alive by this age, out of a million, was 977,500. In 1880, only 161,164 of a million survived to 75 years, while in 1990 the number was 612,740 (Kirkwood, 1999, p. 6, Table 1.1). But behind these statistical abstractions there is an experientable change in the relation between aging and mortality that is mediated by the advance of medical, industrial, and (bio)political technology. Public health

policies, sanitation, vaccination, easier access to nutrition etc. are some among many other measures that composes the technical foundation of the 20th century's demographic revolution (Austad, 1997; Stuart Jay Olshansky & Carnes, 2001).

As I argued elsewhere with greater detail, those technical advancements have not only steeply raised the average life expectation worldwide, but also meant a general leap towards a form of technological domestication of death (Tziminadis, 2021). Along with Norbert Elias' (2001) and more recently Céline Lafontaine's (2010) evaluations of this trend, I claim that modern technological control over nature and, especially, over organic matter, has narrowed down mortality to an issue almost exclusively related to the 'failures' of the human body. Or, at least, such a narrowing down has become an orienting horizon for the scientific and medical management of public health. At the same time, this technical process tied the historical association of mortality and aging in modernity. It cannot be forgotten that until very recently, the shadow of mortality used to concentrate over the early years of childhood, not rarely taking its toll on the delicate assemblage of mother and infant by childbirth (Lafontaine, 2010). "Our forebears", wrote Arthur Imhof, "had the great dying [*das große Sterben*] behind them; today, we have it before us" (1984). It means, our forebears' first challenge in life was to survive early years of mortal probations and after that, if successful, lead a probably short and highly contingent life-time. In a strict sense, we could not even say they had a life-time of their *own* –at least not in the way most of the people in industrialized and developing nations came to recently understand and experience it, as a relatively secure, stage-partitioned unity of time upon which individual existences can be *projected*. Among other things, modern life-times could be individualized given the fact that deaths became a fairly temporalized phenomenon, waiting for us at the end of an unprecedently long course. While contingencies such as violence and disease might still take lives prematurely, the odds of dying from old age are greater, and therefore the expectation of living through a stable course provides the basis for individualization (Elias, 2001). Hence, the technological taming of death that secured the extraordinary longevity of modern populations underlies two predicaments of modern life-times. On the one hand, it was one condition of possibility for what Imhof called "*Vereinheitlichung der Lebenspanne*", something as the transformation of life-time into an individualized, self-referred unity of time. It also contributed to Martin Kohli's (1997) "institutionalization of the life-course" or to what Rosa identified as "temporalized", "stable identities" of modern subjects (Rosa, 2005, p. 355). On the other, it consolidated an unprecedent association between death and aging in which, for the first time in the human history, the inner working of the human body –and not the scarcity of food or violence of outer factors– became the main source of mortal risks.

The idea of aging as a disease, what brings together the different agents of LEVAI, emphasize the last of these predicaments. As noted by some scholars who have interpreted the cultural dynamics behind LEVAI, the reframing of aging as a disease resonates with a dominant economic perspective according to which 20th century's technological success in boosting the lifespan of entire populations also sparked an unprecedented crisis: the burdening of society with pension and healthcare costs (Fletcher, 2016; Katz & Marshall, 2004; Moreira & Palladino, 2008). A way of understanding the appeal of biogerontology and potential aging interventions is, as did Tiago Moreira and Paolo Palladino (2008), observing how they point to a technical solution to the

unfortunate, bio-politically miscalculated problem of populational aging. On another level, however, the idea of aging as a disease also points to the aging body as a hindrance to the further advancement of human potentials that could come into being through technological progress. Greater health and therefore greater longevity could be achieved, were we not bound to the limiting capacities of our evolutionarily determined, 200 thousand years old body.

The achievement of extraordinary longevity is the most evident eudaemonic promise of LEVAI. The success history of longevity in modernity has been so far due to the implementation of technological systems capable of reducing abruptly the contingencies that used to be the greater killers of the human species. The failure history of longevity in modernity is interpreted now as the advent of an 'aging crisis' due to the fact that, although external conditions were dramatically improved, the age-old carcass in which we live could not keep pace with progress. Therefore, breaking free from the constraints of the aging body, being able to alter the biological rhythm of aging, is the only way allowing the march of longevity to continue its progress. It is telling, then, that Aubrey de Grey popularized his rejuvenation program under the catchy expression "longevity escape velocity" (2007). It is a made-up expression that conflates an actuarial concept of increase in life expectation in a given period and the physical concept of 'escape velocity', which refers to the velocity necessary for an object to escape the gravitational influence of a massive body. Although ingenious, the core of the idea follows a very simple logic. The massive body in this case are the evolutionarily determined predicaments of human aging, whose 'gravitational influence' holds back any technical attempt to stave off death; the escape velocity, however, stands for the possibility of achieving, through regenerative procedures, a state in which technology will be able to deliver damage repair in pace faster than the accumulation of damage occurs. This utopic image is present also in Kirkwood's sci-fi-like epilogue to his *Time of our Lives* (1999). In a distant future, after aging research has passed through a long history of failures and glories, people would be able to be periodically submitted to a regenerative procedure which will reverse aging and keep them healthy until the next one, and so indefinitely[3]. Another image comes from David Sinclair's popularizing book Lifespan. After several passages commenting on civilizatory victory over infectious diseases and child mortality, Sinclair notes that, given safer and more accurate driving technologies, car accidents will probably become rarer. With the decrease in car accidents, it will diminish also one of the last external –i.e., not related to the inner workings of the body– major causes of death in industrialized countries. The problem, as Sinclair puts it, is that car accidents are a critical source of organs for transplantation. Because of its suddenness, organs are not rendered unusable by organic decline and are, therefore, suitable for transplantation. Here the question arises: when cars become intelligent, and sudden deaths become even rarer, where do we get the organs for transplantation from? (Sinclair, 219, pp. 204-207). The question is raised only in order to be responded with a eulogy to regenerative medicine. But another interpretation could be given to this question: when machines finally become sufficiently smart to stop killing us and the remaining killer is our primate

[3] A detail is worth noting in Kirkwood's ageless utopia the right to indefinite regeneration is conditioned to a strict birth control; people are however free to choose having more than one child, but with the penalty of no longer being entitled to further regeneration. Those who choose to do so, as did Miranda, the main character of this short story, are called "the timed ones".

body, the only reasonable next step in the progress of longevity will be make also our bodies, so to speak, smarter.

3. A FUTURE FOR MORTALITY: BETWEEN LIBERATION AND SURVIVAL

LEVAI is not simply about producing immortality on earth. Although some radical proponents would claim the possibility of achieving something close to immortality, the more correct definition of what is possible to be achieved, as Sebastian Knell proposed it, is a state of "biological immortality" (2018). An immortal, like a god, cannot be killed. People who no longer age, still can. In a sense, biological immortality is the wished projection of the *conditio humana* in the future horizon of LEVAI, the form of existence that constitute the *other* in relation to which the current status of human aging can be understood as diseaseful. But more importantly, biological immortality would constitute a condition in which, ideally, death would become ultimately a technical problem. Observing the history of the relation between longevity, aging and technology from the perspective opened up by biogerontology, one could say that the 'problem' identified under the sign of the current 'aging crisis' can be defined as: despite all major advancements in the medical, industrial and political management of mortal risks, death –especially the death that comes from within– still poses a limit to technology. The ideal state of biological immortality could be defined, therefore, as the bio-technological condition under which death only occurs when technology achieves its own limits. In this way, LEVAI would be able to push the boundaries of what is feasible in a lifetime much beyond the limits of the organic, transcending, in potentiality, any form of dynamization or self-optimization conceivable under the idea of acceleration. If we stick to de Grey's metaphor, longevity velocity can be understood as the acceleration of the stiff and glacial dynamics of evolution, after which, in principle, any acceleration of the rhythm of life would no longer make sense, for no upper limit would exercise pressure on the living.

Whether the achievement of such a condition would be a liberating event is, however, a different matter. From the enthusiastic perspective of proponents, such as the transhumanist philosopher Nick Bostrom (2008), the crossing of the threshold of aging represents one of the necessary victories needed for the coming of the ultimate utopia. In his appraisal, the good life is something attained through maximization of intelligence, pleasure and, evidently, lifespan. Critics, on the other hand, tend to conceive of the search for such a condition as already tainted by a cultural logic or moral values that, from the outset, contradicts this ideal of liberation. Some, as John Vincent (2008; 2009), see in it the scientific re-affirmation and, consequently, industrial exploration of cultural prejudices against the old in contemporary Western societies, while the forementioned Tiago Moreira and Paolo Palladino (2008), as well as Stephen Katz and Barbara Marshall (2004) observe an alignment between the transformation of aging into a disease and an emerging biopolitical paradigm of self-responsibility and self-optimization. Céline Lafontaine (2009b, 2009a, 2010) and Brian Turner (2009) both see in the frenzy of rejuvenation products and the cult of youthfulness in the wake of 21st century an extension of the culture of conspicuous consumption that has been shaping Western societies since mid-20th century. They argue that the markets for rejuvenation come to their most widespread and sophisticated form precisely when baby boomers, the most affluent generation in human history, come to face the constraints of old age and the hindrances it imposes to their living

standards. For Lafontaine (2010, pp. 44-49), this generation was the first one to transit from a culture of material restrictions and hope in the future to a culture of material abundance and fixation on a vast present of immediate consumerist enjoyments; and the eternalization of this vast present would be concealed in baby boomers' rejuvenation craze (Turner, 2009, p. 41). These approaches emphasize the cultural, economic, and political drives behind LEVAI and how they tarnish the liberating promises of leisure and self-realization such as those contained in Sinclair's portrayal of an ageless existence. Nonetheless, although this criticism may be insightful in pointing out the trends and directions taken by discourses, practices and institutions in the quest for aging intervention, the fact remains that, concretely, the other of aging that orients LEVAI efforts is a desideratum, a form of existence that lies beyond our intellectual grasp[4].

However, the sheer anticipation of such a future possibility might have already effects in the present. The expectation of attaining control over the process of aging and being liberated from the temporal and functional constraints of the body can affect the relation we establish with our finitude now, i.e., the future for mortality designed in the horizon of LEVAI could rearrange the present of mortality. Purely as an expectation, life extension can be understood in a similar way to the 'cultural promise of acceleration', as defined by Rosa. The promise of agelessness can work as a mobilizer of great acceleration, optimization, and relentless investment in self-preservation, i.e., of an ascetic ethics of survival. Or, at least, one sees this ascetism in de Grey's depiction of the path that should lead to longevity escape velocity. Instead of a grandiose transhumanistic revolution sparkled by a Frankenstein-like scientific breakthrough, de Grey expects that such a state will be achieved by more modest but steady investments in regenerative procedures that could possibly reverse deleterious processes and incrementally add healthy years in a person's life. For, as he explains,

> there is a threshold rate of biomedical progress that will allow us to stave off aging indefinitely […]. If we can make rejuvenation therapies work well enough to give us time to make them work better, that will give us enough additional time to make them work better still, which will. . . you get the idea. This will allow us to escape age-related decline indefinitely, however old we become in purely chronological terms (Grey, 2007, p. 330).

In other words: if we can get some few extra years, we can invest them in finding yet another innovative procedure that will grant us some more years ahead, and when the time comes for us to enjoy those gained years, we invest them again on rejuvenation efforts, and so indefinitely. Achieving longevity escape velocity would mean, then, gaining years in a faster pace than they are taken from us[5]. Evidently, such a quest has an aim, which is a final leap towards agelessness, a point

[4] Noteworthy among the intellectual attempts to grasp the sense and direction of LEVAI is the approach opened up by Nikolas Rose (2001) with his idea of a 'politics of life itself'. It points to a new biopolitical formation in which the relation between domination and empowerment is somewhat blurred by the promise of life enhancement at the molecular level. Instead of a disciplined subject, shaped according to discursive idealization such as the 'nation', the 'race', or even 'humanity', the subject of the politics of life itself is shaped according to the magnification of its vital powers. In LEVAI's case, this magnification of life is sought both in the sense of an increase in life's length as well as in life's 'performativity' and, as such, expresses simultaneously an ideal of self-realization and self-exploration. Rose's approach offers us a particularly insightful conception of the paradoxical promise of liberation furthered by most proponents of LEVAI.

[5] For the sake of precision, it is not actually years what we would be gaining. Rejuvenation therapies à la de Grey would grant us the maintenance of age-related damages under a threshold of reversibility, being the gain in years a consequence of that.

beyond which medicine will have biological aging completely under control; or, as tech guru and Google chef engineer Ray Kurzweil would prefer it, a point beyond which biological aging will no longer count, for we will be able to dispose of our bodies and upload ourselves (or our consciousness and our identity with it) in more perfected machines. But until there, a fantastic effort should be put in developing technologies and, more importantly, in devising more efficient practices to keep ourselves alive to the day of redemption. The promise and the penitence are both captured in one of Kurzweil's many proselytizing books' subtitle: live long enough to live forever (Kurzweil & Grossman, 2005). While, from this perspective, 'live forever' is the ideal situation we should all strive for, it is nonetheless the 'live long enough' what appears as an ethical imperative, an imperative of self-preservation and survival. The same imperative is present in Sinclair's book, where whole sessions are dedicated as practical guides on how to survive the longest possible in order to have a chance to benefit from anti-aging treatments in the future.

Until the ultimate leap into biological immortality, all efforts should aim at gaining more 'time', i.e., at devising ways to resist any course of action that might kill us on the waiting. In other words, the prospect of a new form of existence liberated from the organism not only infuses hope regarding a possible *future* in the subject of LEVAI, but also redefines his *present* form of being-in-the-world – retrospectively, that projected form of ageless existence sets up the normative criteria in relation to which our still organically determined existence is evaluated. It is from the perspective of this yet-to-come form of existence that LEVAI frames the body as target of intervention, as an inherently defective machine preventing people to fully achieve the potentials of vitality they are entitled to. In this sense, an ethics of survival cannot only be perceived as central to the mobilization of the expectation of aging intervention, but also as a resonating link between the techno-utopic image of agelessness and the mundane, ascetic practices of what Jürgen Martschukat (2019) has called the "age of fitness". The popularity of highly individualized sports like running, crossfit, weight-lifting etc., in which no aim is there other than 'overcoming' oneself, suggests the existence of an ascetic tendency in bodily practices as well as a cultural appeal of activities in which the body is positioned and perceived as an impending threat to be *survived*. Maybe, the most critical consequence of LEVAI is not so much related to what will happen once the biological immortality is achieved, but to how this expectation reproduces and provides new impulse to a cultural logic of self-optimization.

To a certain extent, we can interpret the strive for 'liberating' life from its organic constraints and the envisioning of a form of existence no longer limited by the dictate of evolution as an extension of the ethical stance identified by Rosa under acceleration, according to which the hope for a good life does not stem from imagining a qualitatively different form of being in the world, but from the possibility of augmenting one's range over the world. As I see it, Rosa's critique of modernity's immanent conception of good life is already a critique of an ethics of survival, which operates in the individual's indefinite struggle for augmenting her range of possibilities in a life-time. Without considering the concrete consequences of the realization of the dreams portrayed by LEVAI, which cannot be measured from our contemporary perspective, what we have left is an appreciation of the consequences of the expectation of such dreams. And this, as I intend to show, can perfectly operate in resonance with the survivalist ethical stance that governs social integration and self-realization under the laws of acceleration.

BIBLIOGRAPHY

Adams, M. (2004). The Quest for Immortality: Visions and Presentments in Science and Literature. In S. Post & R. Binstock (Eds.), *The Fountain of Youth: Cultural, Scientific and Ethical Perspectives on a Biomedical Goal*, pp. 38-71. New York: Oxford University Press.

Austad, S. (1997). *Why we age: What Science is Discovering about the Body's Journey through Life*. Hoboken: John Wiley & Sons.

Barazzetti, G. (2011). Looking for the Fountain of Youth: Scientific, Ethical, and Social Issues in the Extension of Human Lifespan. In J. Savulescu, R. t. Meulen, & G. Kahane (Eds.), *Enhancing Human Capacities*, pp. 335–349. Oxford: Wiley-Blackwell.

Binstock, R. (2004). The Search for Prolongevity: A Contentious Pursuit. In S. Post & R. Binstock (Eds.), *The Fountain of Youth: Cultural, Scientific and Ethical Perspectives on a Biomedical Goal*. New York: Oxford University Press.

Binstock, R. H., Fishman, J. R., & Juengst, E. T. (2006). Boundaries and Labels: Anti-Aging Medicine and Science. *Rejuvenation Research, 9(4),* 433-435.

Blumemberg, H. (1986). *Lebenszeit und Weltzeit* (1st ed.). Frankfurt am Main: Suhrkamp.

Boia, L. (2004). *Forever Young: A Cultural History of Longevity*. London, Reaktion.

Bostrom, N. (2008). Letter from Utopia. *Studies in Ethics, Law, and Technology, 2(1),* 1-7.

Bud, R. (1991). Biotechnology in Twentieth Century. *Social Studies of Science, 21(3),* 415-457.

Elias, N. (2001). *A solidão dos moribundos*. Rio de Janeiro: Zahar.

Farman, A. (2020). On not dying: Secular immortality in the age of technoscience. Minneapolis: University of Minnesota Press.

Fishman, J., Binstock, R., & Lambrix, M. (2008). Anti-aging science: The emergence, maintenance, and enhancement of a discipline. *Journal of Aging Studies, 22*, 295-303.

Fletcher, D.-J. (2016). The Somatechnics of Desire and the Biopolitics of Ageing. In H. Randell-Moon & R. Tippet (Eds.), *Security, Race, Biopower: Essays on Technology and Corporeality*, pp. 167-184. London: Palgrave Macmillan.

Gems, D. (2009). Eine Revolution des Alterns: Die neue Biogerontologie und ihre Implikationen. In S. Knell & M. Weber (Eds.), *Suhrkamp-Taschenbuch Wissenschaft: Vol. 1900. Länger leben? Philosophische und biowissenschaftliche Perspektiven* (1st ed.), pp. 25-45. Frankfurt, M.: Suhrkamp.

Gilleard Chris, & Higgs Paul (2016). Gerontology versus Geriatrics: Different Ways of Understanding Ageing and Old Age. In G. Scarre (Ed.), *The Palgrave Handbook of the Philosophy of Aging*, pp. 31-48. London: Palgrave Macmillan.

Grey, A. de (2005). Resistance to debate on how to postpone ageing is delaying progress and costing lives. *EMBO Reports, 6(S1),* S49-S53.

Grey, A. de (2007). *Ending Aging: The Rejuvenation Breakthroughs that could reverse Human Aging in our Lifetime.* New York: St. Martin's Press.

Gruman, G. J. (1966). A History of Ideas about the Prolongation of Life: The Evolution of Prolongevity Hypotheses to 1800. *Transactions of the American Philosophical Society, New Series, 56(9),* 1-102.

Haldane, J. B. S. (2002 [1923]). *Daedalus; or, Science and the Future: A paper read to the Heretics*, Cambridge, on February 4th, 1923. Retrieved from https://www.marxists.org/archive/haldane/works/1920s/daedalus.htm

Huxley, J. (1968). Transhumanism. *Journal of Humanistic Psychology, 8(1),* 73-76.

Imhof, A. (1984). Von der unsicheren zur sicheren Lebenszeit: Ein folgenschweren Wandel im Verlaufe der Neuzeit. *VSWG: Vierteljahrschrift Für Sozial- Und Wirtschaftsgeschichte, 71(2),* 175-198.

Kass, L. (2003). Ageless Bodies, Happy Souls: Biotechnology and the Pursuit of Perfection. The New Atlantis: *Journal of Technology and Society, Spring*, 9-28.

Katz, S., & Marshall, B. L. (2004). Is the Functional 'Normal'? Aging, Sexuality and the Bio-marking of Successful Living. *History of the Human Sciences, 17(1),* 53-75.

Kirkwood, T. (1999). *Time of our Lives: The Science of Human Aging*. New York: Oxford University Press.

Knell, S. (2018). Lebenszeit und Ergonzeit: Das Projekt der biotechnischen Lebensverlängerung aus anthropologischer Sicht. In G. Hartung & M. Herrgen (Eds.), *Interdisziplinäre Anthropologie. Interdisziplinäre Anthropologie: Jahrbuch 5/2017: Lebensspanne 2.0* (1st ed.), pp. 3-32. Wiesbaden: Springer Fachmedien Wiesbaden.

Knell, S., & Weber, M. (Eds.) (2009). *Suhrkamp-Taschenbuch Wissenschaft: Vol. 1900. Länger leben? Philosophische und biowissenschaftliche Perspektiven* (Orig.-Ausg., 1. Aufl.). Frankfurt, M.: Suhrkamp.

Knorr-Cetina, K. (2005). The Rise of a Culture of Life. *EMBO Reports, 6,* 76-80.

Kohli, M. (1997). Die Institutionalisierung des Lebenslaufs. In J. Friedrichs, K. U. Mayer, & W. Schluchter (Eds.), *Soziologische Theorie und Empirie*, pp. 284-312. Wiesbaden: VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-322-80354-2_12

Krohs, U., & Toepfer, G. (2005). Einleitung. In U. Krohs & G. Toepfer (Eds.), *Philosophie der Biologie: Eine Einführung*. Frankfurt am Main: Suhrkamp.

Kurzweil, R. (1999). *The age of spiritual machines: When computers exceed human intelligence* (1. publ). New York: Viking Penguin.

Kurzweil, R., & Grossman, T. (2005). *Fantastic Voyage*. New York: Plume.

Lafontaine, C. (2009a). The Postmortal Condition: From the Biomedical Deconstruction of Death to the Extension of Longevity. *Science as Culture, 18(3),* 297-312.

Lafontaine, C. (2009b). Regenerative Medicine's Immortal Body: From the Fight against Ageing to the Extension of Longevity. *Body & Society, 15(4),* 53-71.

Lafontaine, C. (2010). *Die postmortale Gesellschaft* (1st ed.). Wiesbaden: VS Verlag für Sozialwissenschaften.

Magalhães, J. P. de, Stevens, M., & Thornton, D. (2017). The Business of Anti-Aging Science. *TRENDS in Biotechnology, 35(11),* 1062-1073.

Martschukat, J. (2019). *Das Zeitalter der Fitness: Wie der Körper zum Zeichen für Erfolg und Leistung wurde* (2nd ed.). Frankfurt am Main: Fischer Verlag.

Moreira, T., & Palladino, P. (2008). Squaring the Curve: The Anatomo-Politics of Ageing, Life and Death. *Body & Society, 14(3),* 21-47. https://doi.org/10.1177/1357034X08093571

Olshansky, S. J. [S. Jay], Hayflick, L., & Carnes, B. A. (2002). No truth to the fountain of youth. *Scientific American, 286(6),* 92-95.

Olshansky, S. J. [Stuart Jay], & Carnes, B. A. (2001). *The quest for immortality: Science at the frontiers of aging*. New York: Norton.

Post, S. G. (2004). Decelerating Aging: Should I drink from a Fountain of Youth? In S. G. Post & R. H. Binstock (Eds.), *The Fountain of Youth: Cultural, Scientific and Ethical Perspectives on a Biomedical Goal*. Oxford, New York: Oxford University Press.

Rosa, H. (2018). *Unverfügbarkeit. Unruhe Bewahren.* Wien, Salzburg: Residenz Verlag.

Rosa, H. (2017). Dynamic Stabilization, the Triple A Approach to the Good Life, and the Resonance Conception. *Questions de communication, 31,* 437-456.

Rosa, H. (2016). *Resonanz: Eine Soziologie der Weltbeziehung* (7th ed.). Berlin: Suhrkamp.

Rosa, H. (2005). *Beschleunigung: Die Veränderung der Zeitstrukturen in der Moderne*. Frankfurt am Main: Suhrkamp.

Rose, N. (2001). The Politics of Life Itself. *Theory, Culture & Society, 18(6),* 1-30.

Roser, M., Ortiz-Ospina, E., & Ritchie, H. (2013). *Life Expectancy*. Retrieved from https://ourworldindata.org/life-expectancy

Sinclair, D. (2019). *Lifespan: Why we age and why we don't have to* (1st ed.). London: Thorsons.

Theunisser, M. (1991). *Die Gegenwart des Todes im Leben In Negative Theologie der Zeit*. Frankfurt am Main: Suhrkamp.

Turner, B. S. (2009). *Can we live forever? A Sociological and Moral Inquiry*. London: Athem Press.

Tziminadis, J.L. (2021). A domesticação técnica da morte: anti-aging como projeto existencial. *Civitas, Rev. Ciênc. Soc., 21(1),* 48-58.

Vincent, J. (2008). The cultural construction old age as a biological phenomenon: Science and anti-ageing technologies*. Journal of Aging Studies, 22*, 331-339.

Vincent, J. A. (2009). Ageing, Anti-ageing, and Anti-anti-ageing: Who are the Progressives in the Debate on the Future of Human Biological Ageing? *Medicine Studies, 1(3),* 197-208.

Weber, M. (1958). Science as a Vocation. *Daedalus, 87(1),* 111-134.

Wittwer, H. (2014). *Einleitung In Héctor Wittwer (Ed.) Der Tod: Philosophische Texte von der Antike bis zur Gegenwart*. Stuttgart: Reclam.