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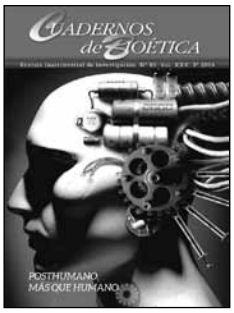


Ética y políticas ante la investigación para extender la vida humana [Ethics and policies in the face of research into extending human life]

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ETHICS AND POLICIES IN THE FACE OF RESEARCH INTO EXTENDING HUMAN LIFE

ÉTICA Y POLÍTICAS ANTE LA INVESTIGACIÓN PARA EXTENDER LA VIDA HUMANA[1]

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ABSTRACT:

If the prediction of some scientists comes true, then we are only few years away from the appearance of the first generation of human beings who will be able to add one year to each remaining year of life expectancy. Faced with this possibility, it seems appropriate to give thought to the public policies that should be adopted. It is better to anticipate the various future scenarios than react to a reality which is a *fait accompli*. To date, the debate has mainly focused on the ethical question: is it good or bad for us humans to achieve immortal life? Until now, neither legal guidelines at State level nor those of international organisations which deal with bioethical issues have concerned themselves with this matter. But before discussing policies, two other matters should be addressed: first, to show how the prolongation of human life can be as much the unwanted outcome of legitimate efforts in search of healthy aging, as one of the aims of the post-humanist project; second, to present the most consistent and shared ethical reasons for rejecting the human immortality project.

Keywords:
Extra-longevity, human enhancement, immortal life, ethics, posthumanism.

RESUMEN:

Si el vaticinio de algunos científicos se llega a cumplir, nos quedan unos pocos años para que surja la primera generación de seres humanos que conseguirá incrementar un año de vida por año de esperanza de vida que le quede. Ante esta posibilidad, es conveniente pensar en las políticas que deberían adoptarse. Es mejor anticiparse a los diversos escenarios futuros que reaccionar ante realidades ya consumadas. Hasta el momento, el debate se ha centrado principalmente en la cuestión ética: ¿es bueno o malo para el ser humano alcanzar una vida inmortal? Ni las normas jurídicas de los Estados ni de los organismos internacionales que tratan de cuestiones bioéticas se han ocupado directamente de esta cuestión. Pero antes de hablar de políticas conviene tratar otros dos asuntos. Primero, mostrar cómo la prolongación de la vida humana puede ser tanto el resultado no buscado de los legítimos esfuerzos por conseguir un envejecimiento saludable, como una de las metas del proyecto posthumanista. Y segundo, presentar las razones éticas más consistentes y compartidas para rechazar el proyecto de inmortalidad humana.

Palabras clave:
Extra-longevidad, mejoramiento humano, vida inmortal, ética, posthumanismo.

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1. Introduction

Exactly five years ago, in September 2009, the Maximum Life Foundation gathered a group of scientists, entrepreneurs, and visionaries to meet for three days with the goal of developing a scientific and business strategy to make extreme human life extension a real possibility within a couple of decades. They decided to name this the "Manhattan Beach Project" because the meeting was held in Manhattan Beach, but the choice was almost certainly because it also called to memory a scientific-technological project which revolutionised 20th century history: the "Manhattan Project", whose aim was to create the atomic bomb. Those gathered included Ray Kurzweil and Aubrey de Grey, probably the most internationally renowned scientists at the moment for their staunch support belief that human life will be radically prolonged in the midterm.

At the beginning of this meeting, Ray Kurzweil, who is currently the Director of Engineering at Google, stated: "we are very close to the tipping point in human longevity (…) We are about 15 years away from adding more than one year of longevity per year to remaining life expectancy".[2]This has been labelled by life-extension guru Aubrey de Grey as "longevity escape velocity". During his speech, Kurzweil also referred to Moore's Law, according to which microchip processing power doubles every two years while its cost falls by half. Kurzweil stated that this rate of progress had been outpaced with the human genome sequencing project and that the same would happen with our knowledge of the biological basis of aging and techniques to fight it. Accelerated knowledge and falling costs allowed him to conclude that, "health and medicine will be a million times more powerful in 20 years."

In addition to presenting the most promising advances in various fields of research aimed at halting and reversing aging in humans, the meeting also served to prompt financing these projects. The organisers were clearly aware that in order to progress at the desired rate and reach the goal of human immortality as soon as possible, it was essential to have the backing of the necessary resources.

If Ray Kurzweil's prediction comes true, then we are only ten years away from the appearance of the first generation of human beings who will be able to add one year to each remaining year of life expectancy. Faced with this possibility, it seems appropriate to give thought to the public policies that should be adopted. To date, the debate has mainly focused on the ethical question: is it good or bad for us humans to achieve immortal life? Or, citing Leon Kass, "Is it really true that longer life for individuals is an unqualified good?"[3] But if the possibility of immortal life is just around the corner, we need to move from ethics to the sphere of policies. It is better to anticipate the various future scenarios than react to a reality which is a *fait accompli*.[4] Until now, neither legal guidelines at State level nor those of international organisations which deal with bioethical issues have concerned themselves with this matter. De Grey[5] also defends the need to talk about policies in favour of immortal life, however, he does so because he understands that if this debate is taken seriously, it will counter current reticence to investing public and private financial resources to find the "elixir of eternal life". Myself, I am more inclined to see this debate leading to a warning that, as much for what would be lost (the mortal condition of being human) as for the risks that would follow in its wake, the immortal life project should be rejected.

But before discussing policies, two other matters should be addressed: first, to show how the prolongation of human life can be as much the unwanted outcome of legitimate efforts in search of healthy aging, as one of the aims of the post-humanist project; second, to present the most consistent and shared ethical reasons for rejecting the human immortality project.

2 Bailey, R., *The Methuselah Manifesto. Witnessing the launch of Immortality, Inc.?*, Reason.com, November 17, 2009, http://reason.com/archives/2009/11/17/the-methuselah-manifesto (accessed on august, 22, 2014).

3 Kass, L. R., "L'Chaim and its limitis: why not immortality?", in Kass, L. R., *Life, liberty and the defense of dignity. The challenge for bioethics*, New York, Encounter, p. 262.

4 Cfr. Juengst, E., et alt., *Biogerontology, "Anti-Aging Medicine" and the challenges of human enhancement*, The Hastings Center Report, 33 (2003), pp. 21-30.

5 Cfr. De Grey, A., *Biogerontolists' duty to discuss timescales publicly*, Annals of the New York Academy of Sciences, 1019 (2004), pp. 542-45.

2. Context: the search for immortality between healthy aging and the post-humanist movement

Between 1955 and 2005 life expectancy in the world increased by 20 years: from 46 to 66. If we break down countries in terms of wealth, currently life expectancy is 76 in the wealthiest countries, falling to 54 in the poorest countries.[6] But if we leave aside the major inequalities between countries, a constant increase in life expectancy has been recorded all over the world during the 20th century and so far in the 21st century. There is heated scientific debate between those who believe the increase is close to stagnating and those, in contrast, who believe this tendency will continue.[7] Even if life expectancy continues to grow and reaches the maximum human lifespan (currently set at around 120), it is highly improbable that we can go beyond this ceiling based only on the strategies of improvements in public health and the fight against diseases that have been used until now. Clearly the increase in life expectancy in the world presents major challenges for humanity, of which I would like to highlight three.

The first consists of prevailing over present differences in life expectancy which are due to inequalities between countries. As pointed out a little earlier, there is currently a difference of almost 25 years between the most developed and the poorest countries in the world, a huge gap that could be bridged simply by guaranteeing some fundamental needs such as sanitary conditions, access to water that is fit to drink, guaranteed supply of food, a basic health service or protection from natural disasters or catastrophes. This would simply mean making available the means to prevent avoidable deaths: those which are not caused by violence but for the want of addressing basic needs.[8]

The second consists of determining what level of priority and resources public authorities should give to the objective of increasing life expectancy among their citizens. There is unanimous agreement when it comes to giving priority to taking steps to meet basic needs (sanitary conditions, drinkable water, etc.), not only because they contribute to increasing life expectancy but, above all, because they guarantee some basic human rights. However, leaving aside such measures which have undoubtedly contributed to increasing life expectancy, we could well ask ourselves if we are duty bound to adopt additional measures aimed specifically at increasing life expectancy.

The third challenge is for increased life expectancy to bring with it an increase in a healthy life expectancy and not merely prolonged decrepitude.[9] Nowadays, nobody questions that one of the most pertinent social healthcare objectives for public authorities around the world, and more so in the more developed countries, is healthy aging for an increasingly aging population as a consequence of increased longevity and fall in the birth rate.

Although there appears to be a broad consensus on the way to deal with each of these challenges, there are major discrepancies in approaches at both national and international levels. As regards the first challenge, international organisations consider fighting against the inequalities which cause the enormous differences in life expectancy between rich and poor countries to be a universal priority. A considerable number of objectives set out in the Millennium Goal sanctioned by the United Nations in 2000, and which have to be reached by the end of next year, 2015, are decisive for increasing life expectancy in underdeveloped countries and bring them close to levels in developed countries. The proof that the official lines expressed at international forums are not in line with the real attitudes of the States themselves is the irregular progress made reaching these objectives.[10]

6 Cfr. World Population Prospects: The 2010 Revision. CD-ROM Edition – Extended Dataset in Excel and ASCII formats (United Nations publication, ST/ESA/SER.A/306).

7 Cfr. Oeppen, J., Vaupel, J., *Broken limits to life expectancy*, Science, 296 (2002), pp. 1029-1031.

8 Cfr. Ballesteros, J., *Más allá de la eugenesia: el posthumanismo como negación del homo patiens*, Cuadernos de Bioética, 23 (2012), pp. 15-24.

9 Cfr. Juengst, E., et alt., *Biogerontology, "Anti-Aging Medicine" and the challenges of human enhancement*, The Hastings Center Report, 33 (2003), pp. 21-30.

10 Cfr. United Nations, *The Millennium Development Goals Report 2014*, New York, 2014; http://www.un.org/en/development/desa/publications/mdg-report-2014.html (accessed on September, 2, 2014).

Concerning the second challenge, it is generally accepted that the increase in life expectancy achieved, particularly during the last 50 years, is clearly satisfactory. However, according to some groups we should not be satisfied with what has been accomplished and take this even further. We have two options. The first consists of promoting as much as possible all research and efforts directed towards increasing life expectancy. The second, far more radical and defended by those in favour of extreme longevity, consists of focusing the fight against aging so that people can enjoy the vigour of youth for hundreds or even thousands of years.[11]

Callahan identifies four models of longevity which to a large degree fit with those just set out. First, the "natural progress model" consists of continuing to do things as they have been done and not to set increasing life expectancy as an objective in itself. Callahan, who identifies himself with this model, states: "I'm not against anti-aging research. I'm in favor of improving the quality of research and the quality of aging research and the quality of life of elderly people, but not deliberately trying to extend life."[12] Second is the "normalizing model", in which the goal is for all of us to live to around 85, the age to which the average Japanese woman lives (the most long-living in the world). The goal of the third, the "optimalizing model", is for the majority of people to live to what is considered the maximum age that a human has been known to reach, that is around 120. Then finally, the goal of the "maximizing model" is to radically increase the human lifespan. Although he favours the first option he does not reject outright the second or third option, but he does reject the fourth.

As regards the third challenge, the most developed areas of the world have been investing in research related to healthy aging for some decades. This is a very sensitive area given the huge increase in the elderly population in developed countries and which will soon be the case in less developed countries also. The problem lies in the fact that it is not altogether clear what lines of research need to be promoted to achieve healthy aging because, theoretically, they can end up producing two unwanted effects: an increase in years lived but not in the quality of life (prolonged senescence); or we could end up managing to radically increase the human lifespan by impeding the aging process (arrested aging). The first is unanimously seen as an undesirable outcome but the second is yearned for, by some at least.

Two equally acceptable lines of working on healthy aging have been proposed to avoid these two effects.[13] The first is to reduce the rate of morbidity associated with aging (compressed morbidity) without further extending the life span. But, to what degree is it appropriate to compress senescent morbidity? This is a philosophical problem, the answer to which will depend on what value we give to age associated decrepitude. If we interpret this as being unmitigatingly bad, we would have to conclude that all efforts to minimise this state of decadence would be desirable. On the other hand, if we consider that a certain degree of age-related decrepitude is tantamount to helping one accept death, then we will accept that such efforts should have limitations. Whatever the case, and following Juengst et al., we need to give an answer to another question: how does one distinguish the morbidities of aging from normal aging itself? While a fundamental consideration, the distinction is no easy matter to resolve. If the aging process is a normal variation in the life of a human being, there is no reason to fight it. However, pathologies associated with the aging process which make this period of human life particularly painful do need to be fought against.

The second way of proceeding consists of slowing down the aging process (decelerated aging), so that human life is prolonged for some years more than the current maximum duration under good conditions, perhaps to the age of 140. This increase in the duration of human life would already be enough to pose serious challenges to society.

11 Cfr. Lucke J.C., Hall W. *Strong and weak life span extension: what is most feasible and likely?,* Australasian Journal of Ageing, 25 (2006), pp. 58-62.

12 Cfr. Stock, G., Callahan, D., *Point-Counterpoint: Would Doubling the Human Life Span Be a Net Positive or Negative for Us Either as Individuals or as a Society?*, Journal of Gerontology: Biological Sciences, 59A (2004), pp. 554–559.

13 Cfr. Juengst, E., et alt., *Biogerontology, "Anti-Aging Medicine" and the challenges of human enhancement*, The Hastings Center Report, 33 (2003), pp. 21-30.

It is worth noting at this point that if at any moment we do manage to achieve immortal life, it is much more likely to happen progressively than abruptly. If follows that the models of compressed morbidity and decelerated aging cannot be contemplated only as paths running parallel to arrested aging, but rather as paths that could end up converging. This consideration is a particularly important when it comes to proposing public policies in the area.

It is patently clear that the centre of the controversy does not lie in the objective of healthy aging, despite the problems it poses and which I have just explained. It is whether one should or should not pursue the aim of radically increasing the human lifespan. Those in favour defend it more as an individual liberty which the State cannot curtail, or even as a priority obligation insomuch as aging as a cause of death is one of the major threats to humanity.

Kass is one of the first authors to offer staunch opposition to this possibility: "[T]o argue that human life would be better without death is, I submit, to argue that human life would be better being something other than human. To be immortal would not be just to continue life as we mortals now know it, only forever. The new immortals, in the decisive sense, would not be like us at all. If this is true, a human choice for human immortality would suffer from the deep confusion of choosing to have some great good only on the condition of turning into someone else."[14]

This argument has come under strong criticism, rejected outright, but not taken seriously enough. A figure so highly recognised in bioethics such as John Harris allows himself to say that Kass' arguments "fail[s] disastrously" and tries to disarm his principal argument in the following terms: "since the (current) essence of being human is to be mortal, immortals would necessarily be a different type of being and therefore have a different identity. There is a sense in which this is true but not, I think, any sense in which it would be irrational to want to change identity to the specific extend. Someone who had been profoundly disabled from birth (blind, say, or crippled) and for whom a cure became available in his or her mid-forties would become in a sense a different person. They would lead a different type of life in many decisive ways. It does not follow that the blind or crippled individual has no rational motive to be cured. It would be both odd and cruel and to say to them, as Kass presumably would have us do, 'it is deeply confused to want to cease to be disabled because then you will no longer exist'" [15]

Harris' objection to Kass' argument is ridiculous, as he himself ends up clearly demonstrating. Kass states the existence of a normative human nature and that the endeavours of medicine are designed to help flourish it within individuals. This is the reason why he advocates fighting against human disability and disease while rejecting interference which infringes on this nature. One could argue with Kass if this normative human nature exists, and if so, what it consists of, but what one cannot do is disregard his argument as lacking coherence. For Kass a person who is no longer blind because of some medical treatment does not become another person; s/he continues being the same person but free of a limitation in their natural process of development. On the other hand, a person who comes to live hundreds of years does turn into something substantially different from what a human being is.

This new reality poses two questions : 1) does this substantial change experienced by human beings constitute an affront to their identity that should be rejected, or is it, rather, an enhancement that any human being can aspire to or even society as a whole should pursue? 2) does this post-human being have dignity as do human beings?

The answer to the first question stirs up an enormous division of opinions. The prolongation of human life beyond the biological clock clearly enters the terrain of "enhancements" of people, which lead to the emergence of post-human beings. It is difficult to deny that immortal individuals experience a substan-

14 Kass, L. R., L'Chaim and its limits: why not immortality*?*, in Kass, L. R., *Life, liberty and the defense of dignity. The challenge for bioethics*, New York, Encounter, p. 262.

15 Harris, M., *Immortal Ethics*, Annals of the New York Academy of Sciences, 1019 (2004), pp. 531.

tial change to their identity and that this change has repercussions for humanity as a whole. In response to the second question, one should presume that post-humans would continue to have the same dignity as humans.[16]

In this post-human context the extreme prolongation of the lifespan of people as an objective in itself does not seem to be sufficient. Even if we were able to prolong human life indefinitely, human beings would still be vulnerable:[17] they could die as a result of an accident, violence, an extremely unhealthy lifestyle or an incurable disease. Given these conditions, is it not logical to equally try and get round the vulnerability that comes with all human existence? This is how John Gray expresses it: "The pursuit of immortality through science is only incidentally a project to defeat death. At bottom it is an attempt to escape contingency and mystery. Contingency means humans will always be subject to fate and chance, mystery that they will always be surrounded by the unknowable. For many this state of affairs is intolerable, even unthinkable. Using advancing knowledge, they insist, the human animal can transcend the human condition."[18]

If one sees the human body in terms of a machine which a human being needs to be able to live and act, one would have to accept that this is a very defective machine, not only because it has a limited lifespan but also because it is constantly subjected to an infinite number of contingencies which threaten its performance. It follows that the immortal life project, in terms of coherence, tends to be linked to not only the mere prolongation of life but also achieving an immortality which is free of risk and threat. This could be achieved by creating a more ideal piece of "hardware" as opposed to the present human body so that people can live much longer, equipped with more capabilities and subject to fewer death risks. In order to reach human immortality Aubrey de Grey would be inclined to advocate developing infinitely long-life bodies and Kurzweil, more for machine-human being hybrids, composed of nanobots whose existence would mainly take places within the virtual world.[19]

For immortal to be truly attractive it is necessary to overcome the contingency and mystery which define human existence. It follows that the human immortality project is nothing more than the door leading to the post-human world. Those in favour present it as a world much like our own now, but in which its inhabitants live indefinitely, are free from any pain and enjoy superlative intelligence and kindness. The most audacious and coherent are quick to state that the goal consists of saturating the entire universe with our intelligence. This utopia is both boring and horrifying at the same time. Human existence consists of confronting challenges, in which success or failure does not depend entirely one oneself. If (post)human existence came to consist of the inexorable realisation of one's own desires by means of an intelligence of cosmic proportions it might be unbearably boring. As George Orwell claims, "produce a perfect society by an endless continuation of something that had only been valuable because it was temporary."[20] We humans are not made so that our desires may automatically become reality, despite the fact that we constantly live with this yearning. We humans are not made to be gods. The post-human would certainly be substantially different from us. But who would venture to say whether this post-human would feel comfortable with this condition or, rather, would yearn for the mysterious and contingent world of the humans who created it. Whatever the case, it does not seem to make much sense for human beings to aspire to becoming someone who is substantially different from who they are without the assurance that this condition will be substantially

16 Cfr. Bostrom, N., *In defense of posthuman dignity*, Bioethics, 19 (2005), pp. 202-214; y Bellver, V., *El debate sobre el mejoramiento humano y la dignidad humana. Una crítica a Nick Bostrom*, Teoría y Derecho, 11 (2012), pp. 82-93.

17 Cfr. Harris, M., *Immortal Ethics*, Annals of the New York Academy of Sciences, 1019 (2004), pp. 527-534.

18 Gray, J., *The immortalization commission. Science and the strange quest to cheat death*, New York, Allen Lane, 2011, p. 213.

19 Cfr. Kurzweil, R., Grossman, T., *Transcend: nine steps to living well forever*, New York, Rodale Books, 2009.

20 Cfr. Orwell, G., *Can socialists be happy?*; in Orwell, G., All art is propaganda. Critical Essays, New York, Mariner Books, 2009, p. 202-209; and Williams, B., *The Makropulos Case: Reflections on the Tedium of Immortality*; in Williams, B., Problems of the Self, Cambridge, Cambridge University Press, 1973, pp. 81-100.

better than what it is now. As it is impossible to know, post-human enterprise becomes a game of roulette where you win or lose everything.

There are no solid arguments to take as given that the post-human project, which encourages the desire for immortal life, will work. History is a constant reminder that all the promises of total freedom for humanity have brought major atrocities in their wake against certain human beings. When human beings attempt to seriously transform Earth into heaven, it unfailingly turns into hell. In these attempts, a far cry from a divine state, humans display even more so their capacity for self-destruction. More than likely Gray is not exaggerating when he states that: "the end-result of scientific inquiry is to return humankind to its own intractable existence. Instead of enabling human to improve their lot, science degrades the natural environment in which humans must live. Instead of enabling death to be overcome, it produces ever more powerful technologies of mass destruction. None of this is the fault of science; what it shows is that science is not sorcery. The growth of knowledge enlarges what humans can do. It can not reprieve them from being what they are."[21]

3. Reasons: why we should reject the immortal life project

The debate over whether it is licit or not to prolong human life indefinitely has hardly touched the sphere of public opinion, however it is an on-going controversy in the academic world. Both those in favour as well as those opposed to this possibility accuse each other of being irrational. One side accuses the other of turning religion into the norm that should govern scientific research and social life – they believe religion is a personal matter, remote from scientific reason and should not play role in public life. The other side accuse them of turning science into a religion that will bring salvation on Earth to humans – for whom science is nothing more than an instrument of power unable to make any sense of the world of human life.[22] To focus the debate in these terms neither contributes to casting light on nor finding agreement on this issue. It is far more productive to pay attention to the concrete ethical reasons and the purpose of this section. I am not going to concern myself with the wide and heated ethical debate, but rather limit myself to the main ethical reasons why, to my understanding, we should abandon any pretence of radically extending human life.

These arguments can be divided into two categories: categorical arguments, which reject outright immortal life; and prudential or pragmatic arguments, which arrive at the same conclusion after considering all the circumstances and consequences together.[23] The categorical arguments which have been put forward, based on acknowledging some limitations imposed by human nature that should be respected, seem to me to be consistent. However, they have been the object of both virulent and, on occasions, inconsistent criticism. In an attempt to find consensus, I shall focus on reasons of a more prudential nature that can be shared by people with distinct views on human nature and existence.[24]

A. Fragmentation of society. Debates over whether germ line interventions (in which genetic modifications are passed on to all the next generations) are legitimate or not, clearly show that if put into practice, societies would be deeply divided into two castes: genetically modified and genetically natural. [25] The film *Gattaca* (Mike Niccol, 1997) offers a convincing view of how the world would be divided: "valids" (engendered through genomic selection) and "in-valids" (engendered through natural gamete fusion). Likewise, there would be a similar social fragmentation between those who are "extra-long lifers" and the "natural". We might well think that

21 Gray, J, *The immortalization commission. Science and the strange quest to cheat death*, New York, Allen Lane, 2011, p. 235.

22 Cfr. Ballesteros, J., *La religión, ¿freno o motor de la ciencia*, Cuadernos de Bioética, 19 (2008), pp. 479-484; Gray, J., *Heresies. Against progress and other illusions*, London, Granta books, 2004.

23 Cfr. Partridge, B., Hall, W. *The search for Methuselah. Should we endeavour to increase the maximum human lifespan?,* EMBO Reports, 8 (2007), pp. 888-891.

24 Cfr. Pijnenburg, M., Leget, C. *Who wants to live forever? Three arguments against extending the human lifespan*, Journal of Medical Ethics, 33 (2007), p. 587.

25 Cfr. Silver, S. *Remaking Eden: How Genetic Engineering and Cloning Will Transform the American Family*. New York, Harper, 2007.

the "long lifers" would find themselves in an advantageous position, but we could not rule out the possibility that they would be stigmatised since initially they would be far fewer in number and could be seen by the "naturals" as a threat. Regardless of the positive and negative effects for each of these two classes, difficult to envisage at the moment, there would most certainly be a serious fragmentation of society that would inevitably lead to tension.

It is logical to think that it would be the wealthiest who would first be able to enjoy an immortal life. The same purchasing power that would allow them immortality would also be put to use to shape a world and society better equipped for "extra-long lifers". Does it make sense for some to secure for themselves the "elixir of life" when there is already such a huge gap between the rich, who live longer and in better conditions, and the poor, with shorter lifespans and more painful deaths?[26]

This objection has been refuted with the assurance that information and communication technologies likewise began by being prohibitively expensive for the majority of people and, after a few years, the cost fell to the point of being affordable for everyone's pocket; the same would happen with anti-aging treatment. But leaving aside whether or not such treatments would be within the reach of the general public within a short time, the question remains whether it makes sense to assign resources to research into how to prolong human life when there are so many people in the world who are at serious risk of dying before the age of 40 and who, if given access to extremely inexpensive treatment, could raise their life expectancy another 40 year or more.[27]

B. Complete change of private and social life. Even if immortal life could be introduced into society without bringing in its wake serious divisions and conflicts, albeit an improbable scenario, it would almost certainly bring major changes to people's lives and society.[28] All human life, being unique and unrepeatable, is expressed in stages common to all humans, and also common to non-human animals: birth and initiation into life; developing personal life projects and taking on responsibilities; and outcome, generally preceded by a gradual decline of physical and cognitive faculties. There is a certain proportional relationship between these three periods, in that the first and the third tend to be appreciably shorter than the second. Infancy and youth constitute essential preparation for adult life. Old age constitutes the finalising of one's entire existence and preparation for death. Human life is neither pure biology expressing itself during its continual process of evolution, nor pure will of power trying to harness a hostile biology. It is the biography of each human being.

Societies are organised around the expectation that the life of its members are of a narrative nature. Parents take responsibility for raising and educating their children, for which they can rely on the collaboration of society as a whole. As the children reach certain thresholds of maturity they progressively take over their own lives, carrying out professional duties, having families and taking on civic responsibilities. In this stage, and with the cooperation of the society they actively participate in, they take charge of both those how are beginning their lives (their children) as well as those who are beginning to take their leave (their parents). After a period that varies between thirty and fifty years, people come to the end of this stage of maturity and begin their final stage in life. Here they combine handing over responsibilities to the new generation of adults with a greater enjoyment of the present, carrying out more pleasurable and less strenuous projects and preparing for the end of their life.

In the event of human life being prolonged for hundreds of years, the above narrative structure would disappear completely. The journey analogy, which has so often been used by humans across time to grasp and

26 Cfr. Mauron, A., *The choosy reaper*, EMBO Reports, 6 (2005), pp. 67-71.

27 Cfr. Pijnenburg, M., Leget, C., *Who wants to live forever? Three arguments against extending the human lifespan*, Journal of Medical Ethics, 33 (2007), pp. 586.

28 Cfr. De Grey, A., *Report on the open discussion on the future of the life extension research*, Annals of the New York Academy of Sciences, 1019 (2004), pp. 552-553.

narrate the development of their life[29], would no longer be of any use. Immortal life would more resemble perpetual movement in which each event would end up being equally monotonous and irrelevant.[30]

The prospect of a race made up of human beings who live almost indefinitely poses almost countless questions about the unknown. The only thing which is certain is that the social and inter-generational organisation ways of thinking which have held sway until now would no longer be valid and would have to be substituted for others which are completely new. To cap it all, as it would be impossible for all human beings to move to the state of extra longevity, we would find ourselves in a situation in which societies would have to express itself in terms that would make life possible for one and the other. Can we be so sure of the benefits of an extra-long life that we want to delve into this universe of unknown quantities apparently difficult to resolve?

Among the most transcendental changes to and dangers for society would be the need to set up greater control over "entry to" and "exit from" humanity. It is obvious that if people continue to be born and those living do so for much longer than before, the growth rate and aging of the world population would be even higher than now. Those who are party to extra-longevity propose drastically limiting the number of births as a solution. To their way of thinking it is better for people who are alive now to live longer than for new people to live the number of years that might be reasonably expected at the moment.[31] The reason given is simple: those people who are alive are conscious of what it would mean to be deprived of more years of life, while those who do not exist yet are clearly unable to be conscious of what they would miss.[32]

This reasoning can be questioned from its very bases. Firstly, it takes as given that most people who are alive would prefer to live longer in return for cutting the number of births rather than to live with the rhythm of inter-generation succession we have experienced until now. Secondly, it is not clear that being able to eventually satisfy an indeterminate number of peoples' desire to live for hundreds or thousands of years is going to appreciably outweigh the eventual perverse effects of this social change. Finally, it is naive to think that the life in society is going to be able to rely on the innovative capacity and strength to live that comes with each new generation if the rhythms of inter-generational succession were to be prolonged for centuries. Does a person who lives for hundreds of years in the physical condition of a person of 30 have the same capacity to generate new ideas and hopes throughout these hundreds of years as a 30 year-old who is subject to the inexorable biological evolution dictated by the passing of time? Nobody knows, but the evidence shows us that new generations always bring levels of innovation that already established generations are unable to generate (and, at times, are not even able to assimilate).

Logically an extraordinary increase in the average lifespan of people begs the question whether such an increase should not just be accompanied by not the right to one's own life but also one's duty to die. It is logical that in a context of extra-longevity, when someone finds their life unbearably boring, that they should want to end it. In this new context, would we have to recognise the right to assisted suicide or euthanasia? But parallel to this possible right we also need to ask whether the right to die would have to be decreed, when people find their life no longer flourishing or it becomes an enormous burden for society. If such a duty were established we should also ask ourselves if fulfilling it could be coactively required and, in such cases, which authority and under what circumstances should it be carried out. Does it make sense to subject extra-long lifers to a cost-profit test for society? It seems a major step backwards for society to determine a person's right to live according to their contribution to society. Furthermore, it would be impossible to agree on reasonable criteria as

29 Cfr. Choza, J., Choza, P., *Ulises, un arquetipo de la existencia humana*, Barcelona, Ariel, 1996.

30 Cfr. Glannon, W., *Identity, prudential concern and extended lives*, Bioethics, 16 (2002), pp. 266-283.

31 Cfr. Schloendorn, J., *Making the case for human life extension: personal arguments*, Bioethics, 20 (2006), pp. 191-202.

32 Cfr. Singer, P., *Should We Live to 1,000?*, Project Syndicate. A World of Ideas, December 10, 2012, http://www.project-syndicate.org/commentary/the-ethics-of-anti-aging-by-peter-singer (accessed on april, 13, 2014).

to the social utility of each human life. But undoubtedly the pressure to establish measures of this type would be enormous, since the "entry to" the world of new human beings would be dependent on the "exit from" by others, and the prolongation of the lives of people who are socially very harmful during hundreds of years could be seen a burden that society cannot bear.

4. Policies: what to do in the face of extra longevity projects for human life

For some years a group of visionaries who hold important positions in academia, science and business claim that it is possible for human beings to achieve immortal life in the short or midterm. At a scientific level this claim is highly controversial.[33] This aspiration is defended by some not only as an individual liberty but also our duty to fight against aging in as much as it is the biggest problem faced by humanity.[34] Seen from another perspective, achieving immortal life is part of the very essence of post-humanism. For post-humans to be able to enjoy the superlative capabilities they will limitlessly have, requires longevity, while at the same time having these capabilities makes the goal of an extra-long life particularly attractive.

Although I have sustained that there are consistent ethical reasons for ruling out the immortal life project, there is not even a hint of unanimity on the matter. Meanwhile, there are ever-increasing private interests with their sights set on fostering research in this area to the maximum. What policies can be adopted and put into effect in these circumstances?

Some, among whom we find not only scientists and those representing the bio-technological industries but also philosophers and bioethics specialists,[35] are convinced that: "a free-market environment with real individual choice, modest oversight, and robust mechanisms to learn quickly from mistakes is the best way both to protect us from potential abuses and to channel resources toward the goals we value."[36]

At the present time, in which scientism and economicism are exacerbated[37], it is hardly realistic to trust in the potentialities of these "robust mechanisms" as assurance that the aims of technological developments are to benefit the progress of humanity as a whole and not a given few: "While the community of research scientists has in the past done an admirable job in policing itself in such areas as human experimentation and the safety of recombinant DNA technology, there are now to many commercial interests chasing too much money for self-regulation to continue to work well into the future."[38] To openly trust in the free market, individual choices and prompt self-correction of errors appears naïve in view of the major scientific frauds of late in the field of stem cells as those featuring Hwang Woo-Suk or Hiruko Obokata,[39] not to mention two of the major problems we are currently facing, namely climatic change and the economic crisis which began in 2008.

The criticism by one of the gurus of post-humanism, Marvin Minsky, is precisely that the problem with humanity lies in the fact that "nobody is at the wheel of the planet".[40] Even so, he is convinced that technological developments by themselves are going to lead us spontaneously towards a "brave new world" of extra longevity individuals with extraordinary capabilities.

On the opposition bench to those who claim that regulatory measures are unnecessary, we find the fatal-

33 For instance, according to Kyriazis "it is implausible that curing aging will occur by using physical interventions alone" as De Grey proposes; cfr. Kyriazis, M., *The impracticality of biomedical rejuvenation therapies: translational and pharmacological barriers*, Rejuvenation Research, 17 (2014), pp. 390-396; Cfr. De Grey, A., *The practicality or otherwise of biomedical rejuvenation therapies: a response to Kyriazis*, Rejuvenation Research, 17 (2014), pp. 397-400.

34 Cfr. De Grey, A., *The Real End of Ageism*, Rejuvenation Research, 17 (2014), pp. 95-96.

35 Cfr. Fukuyama, F., *Our posthuman future. Consequences of the biotechnology revolution*, New York, Farrar, Strauss and Giroux, 2002, p. 204.

36 Stock, G., *Redesigning humans. Our inevitable genetic future*, Boston, Houghton Mifflin, 2002, p. 201.

37 Cfr. Ballesteros, J., Globalisation: from chrematistic rest to humanist wakefulness, in Ballesteros, J., Fernández Ruiz-Gálvez, E., Talavera, P. (eds.), Globalization and human rights. Challenges and Answers from a European Perspective, Springer, Londres, 2012, pp. 3-26.

38 Fukuyama, F., *Our posthuman future. Consequences of the biotechnology revolution*, New York, Farrar, Strauss and Giroux, 2002, p. 185.

39 Cfr. Cfr. Pollack, A. "Stem Cell Research Papers Are Retracted", *The New York Times*, July, 2, 2014,
http://www.nytimes.com/2014/07/03/business/stem-cell-research-papers-are-retracted.html (accessed on July, 24, 2014).

40 Elola, J., *Nadie está al frente del planeta. Entrevista con Marvin Minsky*, El País-Domingo, August, 31, 2014, p. 8-9.

istic viewpoints of those who believe it is impossible to adopt effective guidelines to ensure that technological developments applied to human life contribute to the progress of humanity: "If people try, during the coming century, to redesign human beings, they will not do so on the basis of an enlightened international consensus. It will occur haphazardly, as part of competition and conflict among states, business corporations and criminal networks. The new, post-human creatures that may emerge from these murky rivalries will not be ideal types embodying the best human ideals: they will reproduce some of the worst features of unregenerate humanity."[41]

Among those who believe we should do nothing (as does Stock) or we are unable to do anything (as does Gray) in the face of technological developments to achieve immortal life, some of us think that we can and must do something. This is, however, no easy matter due to two types of circumstances. First, in many cases it is not easy to determine whether the extreme prolongation of human life is the target. While cloning or genetic intervention in the germ line are endeavours which can be clearly identified, the same is not the case in the field of extra-longevity. Second, because policies can only be effective if they have global backing: as soon as there is a State which offers a more flexible legal framework, it automatically becomes a biotechnological haven to which all interested parties will flock to do what is prohibited in other States.

My policies proposal is modest because it attempts to be realistic. The staunch defenders of extra-longevity will hold them as unjustifiably limiting, however I see them as proposals aimed at protecting the rights of people and the basic conditions for the progress of science and thus inescapable. On the other hand, some of those opposed to immortal life will hold them as completely inadequate. Although I recognize they are insufficient to prevent the birth of extra-long lifers, I understand that it is hardly realistic at this point in time to think that we can achieve consensus to sanction the most effective measures.

1. Fight against the con artists. At the moment there is no intervention that can extend human life beyond its biological clock.[42] Life expectancy is increasing throughout the world and there is a proliferation of studies which, to one degree or another, contribute to prevailing over illnesses associated with aging and indirectly prolonging human life. But there is no glimmer of any real possibility of making the leap to human immortality. Time passes by and the promises of immortal life made by some have now expired without having reached goals that would lead us to think that the extreme prolongation of human life will be achieved, even if later than anticipated.

Those who make these kinds of promises run the risk of creating false expectations in the general public, obtaining financing under false pretences and earning fame they do not deserve: they are taken as champions of scientific progress when they are more likely con artists. The philosophers who try to lend legitimacy to these speculations and the media that echo these promises, as spectacular as they are unrealistic, equally aid and abet in this fraud. It would be a good idea for some prestigious academic authority to hold a forum on a regular basis to rigorously assess to what degree announcements in this field have been fulfilled. In this way science itself, in whose name they make these promises, would be able to determine the degree of accuracy, error, or even deception in each of these announcements. This is not a question of censoring the development of "crazy ideas" which have so often revolutionised the world, but rather to identify *a posteriori* what in effect have been nothing more than touting snake oil.

2. Reject all those interventions that attempt to impose extra-longevity. This would involve preventing the programming of new human beings with extra longevity.

41 Crr. Gray, J., *The unstoppable march of the clones*, The New Statesman, June, 24, 2002, http://www.newstatesman.com/node/143246 (accessed on September, 2, 2014). Afterwards his article was published as a chapter of the book: Gray, J., *Heresies. Against progress and other illusions*, London, Granta books, 2004.

42 Cfr. Marshall, J., *Life extension research: An analysis of contemporary biological theories and ethical issues*, Medicine, Health Care and Philosophy, 9 (2006), pp. 87-96.

At present the proposals that attempt to extend human life are aimed at adults who are able to give their consent. However, we cannot rule out that in the future it will be possible to engender new human lives that could live for hundreds or thousands of years. The arguments that have been put forward against genetic intervention in germ line cells,[43] and which are the basis of prohibiting this practice by both UNESCO and the Council of Europe,[44] are equally valid for denying authorisation to engender "immortal" human embryos. Nobody can impose extra longevity on anybody without their consent. Preconception and prenatal interventions for therapeutic reasons can be legitimate, but never actions which mean imposing the will of the progenitors on their offspring.

3. Engender international participation. Faced with the challenge of extending human life beyond its biological limits, public authorities seem to be faced with choosing between three basic positions: 1) prohibition, because it is something that should never be attempted; 2) allow it, because in principle no scientific endeavour should be prohibited and is part of the legitimate exercise of human liberty; or 3) promote it, on the understanding that there is an obligation to combat aging. Of the three, the second is without doubt the one which seems most plausible for two reasons: it is a half-way position between the other two and it seems to permit scientific research without making the mistake typical of authoritarian regimes, namely prohibition.

But this is not the correct way to pose this question. To allow immortal life means to completely alter the conditions of human life: extra longevity humans would be substantially different from the others and humanity would have to deal with an element completely foreign to what human history has been until that moment. Should a radical alteration of the conditions of human life be allowed when it is impossible to know if, in these conditions, extra longevity beings would be more or less happy and, more to the point, if the adequate conditions could be created for cohabitation between mortals and immortals? Clearly it is not possible to know one or the other. Faced with this situation, some will say that it makes no sense to walk down a path without knowing where it leads. Others, on the other hand, will interpret this in terms of an unquestionable good for humans which cannot be relinquished.

A minimal proposal to try and bridge the opposing positions consists of subjecting the decision to authorise or not immortal life to all of humanity. The appearance of immortal people not only affects those who want this kind of life but all of humanity, insomuch that it alters the basic preconditions upon which the entire organisation of society is built: the finite and vulnerable nature of human life. Therefore it is logical that all human beings should be able to express themselves on this matter. In the same way that we should all be able to participate when it comes to deciding on a substantial change in the environmental conditions of the planet, we should also be able to do so regarding basic conditions of the human species. In the event of a possible global consultation, would a 50% majority be enough to impose this new state on the others?

4. The public financing of research directly related to extending human life. The world's population is rapidly getting older and it is reasonable for public authorities to give preference to research into healthy aging. One indirect and unintentional effect of this research could be the gradual increase in the lifespan of human beings. It is another matter entirely, however, to designate public money to research whose immediate objective is to extend the human lifespan. In principle, it makes no sense to finance with public funds research projects which are not aimed at improving people's lives, but rather transforming their fundamental conditions of life. Working from the basis that this position is not acceptable, I propose that public funds should only be designated for this research in cases where there is wide public support and after justifying that the R + D duly responds to true social needs.

5. Protecting research subjects in immortal life projects. The promise of immortal life is extremely attractive

43 Cfr. Habermas, J., *The future of human nature*, Cambridge, Polity Press, 2003.

44 Cfr. Bellver, V., *Intervenciones genéticas en la línea germinal humana y justicia*, in Ballesteros, J. y Fernández, E. (coords.), Biotecnología y posthumanismo, Cizur Menor, Thomson-Aranzadi, 2011, pp. 461-485.

to many people, who would be willing to do anything to achieve this aim, or at least have the chance to do so. It is likely that the number of people willing to participate in experiments will multiply and that they will take on serious risks to their health. The research principles and guidelines in force around the world should be scrupulously applied to this kind of research: those participating should be made especially aware of the risks they run in this kind of research and scrutiny of them reinforced.[45]

5. Conclusion

Despite the promises of some scientists and visionaries, there is no evidence to suggest that, in the midterm, human lifespan is going to be radically extended. If at any time in the future it were possible and were carried out, human identity, which is defined by its finite and contingent nature, would be substantially altered. The appearance of people with extra longevity would generate a major fragmentation of society which would be unwanted and furthermore would unnecessarily create an endless number of problems difficult to solve.

Despite there being strong ethical reasons to reject immortal life, there is tremendous division on the matter. In a future scenario in which the technology to achieve extra longevity were available, it would be no easy matter to agree on policies with sufficient global backing to be able to channel this challenge adequately and effectively. These last few pages have offered some proposals.

References

Bailey, R., *The Methuselah Manifesto. Witnessing the launch of Immortality, Inc.?*, Reason.com, November 17, 2009, http://reason.com/archives/2009/11/17/the-methuselah-manifesto (accessed on august, 22, 2014).

Ballesteros, J., Globalisation: from chrematistic rest to humanist wakefulness, in Ballesteros, J., Fernández Ruiz-Gálvez, E., Talavera, P. (eds.), *Globalization and human rights. Challenges and Answers from a European Perspective*, Springer, Londres, 2012, pp. 3-26.

Ballesteros, J., *Más allá de la eugenesia: el posthumanismo como negación del homo patiens*, Cuadernos de Bioética, 23 (2012), pp. 15-24.

Ballesteros, J., *La religión, ¿freno o motor de la ciencia*, Cuadernos de Bioética, 19 (2008), pp. 479-48.

Ballesteros, J., Fernández Ruiz-Gálvez, E., Talavera, P. (eds.), *Globalization and human rights. Challenges and Answers from a European Perspective*, Springer, Londres, 2012.

Ballesteros, J. y Fernández, E. (coords.), Biotecnología y posthumanismo, Cizur Menor, Thomson-Aranzadi, 2011, pp. 461-485.

Bellver, V., *El debate sobre el mejoramiento humano y la dignidad humana. Una crítica a Nick Bostrom*, Teoría y Derecho, 11 (2012), pp. 82-93.

Bellver, V., *Intervenciones genéticas en la línea germinal humana y justicia*, in Ballesteros, J. y Fernández, E. (coords.), Biotecnología y posthumanismo, Cizur Menor, Thomson-Aranzadi, 2011, pp. 461-485.

Bostrom, N., *In defense of posthuman dignity*, Bioethics, 19 (2005), pp. 202-214.

Choza, J., Choza, P., *Ulises, un arquetipo de la existencia humana*, Barcelona, Ariel, 1996.

De Grey, A., *Biogerontolists' duty to discuss timescales publicly*, Annals of the New York Academy of Sciences, 1019 (2004), pp. 542-45.

De Grey, A., *Report on the open discussion on the future of the life extension research*, Annals of the New York Academy of Sciences, 1019 (2004), pp. 552-553.

De Grey, A., *The practicality or otherwise of biomedical rejuvenation therapies: a response to Kyriazis*, Rejuvenation Research, 17 (2014), pp. 397-400.

De Grey, A., *The Real End of Ageism*, Rejuvenation Research, 17 (2014), pp. 95-96.

Elola, J., *Nadie está al frente del planeta. Entrevista con Marvin Minsky*, El País-Domingo, August, 31, 2014, p. 8-9.

Fukuyama, F., *Our posthuman future. Consequences of the biotechnology revolution*, New York, Farrar, Strauss and Giroux, 2002.

45 Cfr. Marshall, J., *Life extension research: An analysis of contemporary biological theories and ethical issues*, Medicine, Health Care and Philosophy, 9 (2006), p. 94.

Glannon, W., *Identity, prudential concern and extended lives*, Bioethics, 16 (2002), pp. 266-283.

Gray, J., *The immortalization commission. Science and the strange quest to cheat death*, New York, Allen Lane, 2011.

Gray, J., *Heresies. Against progress and other illusions*, London, Granta books, 2004.

Gray, J., *The unstoppable march of the clones*, The New Statesman, June, 24, 2002, http://www.newstatesman.com/node/143246 (accessed on September, 2, 2014).

Habermas, J., *The future of human nature*, Cambridge, Polity Press, 2003.

Harris, M., *Immortal Ethics*, Annals of the New York Academy of Sciences, 1019 (2004), pp. 527-534.

Juengst, E., et alt., *Biogerontology, "Anti-Aging Medicine" and the challenges of human enhancement*, The Hastings Center Report, 33 (2003), pp. 21-30.

Kass, L. R., "L'Chaim and its limitis: why not immortality?", in Kass, L. R., *Life, liberty and the defense of dignity. The challenge for bioethics*, New York, Encounter, pp. 257-276.

Kurzweil, R., Grossman, T., *Transcend: nine steps to living well forever*, New York, Rodale Books, 2009.

Kyriazis, M., *The impracticality of biomedical rejuvenation therapies: translational and pharmacological barriers*, Rejuvenation Research, 17 (2014), pp. 390-396.

Lucke J.C., Hall W. *Strong and weak life span extension: what is most feasible and likely?,* Australasian Journal of Ageing, 25 (2006), pp. 58-62.

Marshall, J., *Life extension research: An analysis of contemporary biological theories and ethical issues*, Medicine, Health Care and Philosophy, 9 (2006), pp. 87-96.

Mauron, A., *The choosy reaper*, EMBO Reports, 6 (2005), pp. 67-71.

Oeppen, J., Vaupel, J., *Broken limits to life expectancy*, Science, 296 (2002), pp. 1029-1031.

Partridge, B., Hall, W. *The search for Methuselah. Should we endeavour to increase the maximum human lifespan?,* EMBO Reports, 8 (2007), pp. 888-891.

Pijnenburg, M., Leget, C. *Who wants to live forever? Three arguments against extending the human lifespan*, Journal of Medical Ethics, 33 (2007), pp. 585-587.

Pollack, A. "Stem Cell Research Papers Are Retracted", *The New York Times*, July, 2, 2014, http://www.nytimes.com/2014/07/03/business/stem-cell-research-papers-are-retracted.html (accessed on July, 24, 2014).

Schloendorn, J., *Making the case for human life extension: personal arguments*, Bioethics, 20 (2006), pp. 191-202.

Silver, S. *Remaking Eden: How Genetic Engineering and Cloning Will Transform the American Family*. New York, Harper, 2007.

Singer, P., *Should We Live to 1,000?*, Project Syndicate. A World of Ideas, December 10, 2012, http://www.project-syndicate.org/commentary/the-ethics-of-anti-aging-by-peter-singer (accessed on april, 13, 2014).

Stock, G., *Redesigning humans. Our inevitable genetic future*, Boston, Houghton Mifflin, 2002.

Stock, G., Callahan, D., *Point-Counterpoint: Would Doubling the Human Life Span Be a Net Positive or Negative for Us Either as Individuals or as a Society?*, Journal of Gerontology: Biological Sciences, 59A (2004), pp. 554–559.

United Nations, *World Population Prospects: The 2010 Revision*. CD-ROM Edition – Extended Dataset in Excel and ASCII formats (United Nations publication, ST/ESA/SER.A/306).

United Nations, *The Millennium Development Goals Report 2014*, New York, 2014; http://www.un.org/en/development/desa/publications/mdg-report-2014.html (accessed on September, 2, 2014).

Williams, B., *The Makropulos Case: Reflections on the Tedium of Immortality*; in Williams, B., Problems of the Self, Cambridge, Cambridge University Press, 1973, pp. 81-100.