ETHICAL REFLECTIONS IN A TRANSHUMANISM FRAMEWORK

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ABSTRACT

We are at the beginning of a technological tsunami, known as the Digital Revolution, that will transform many of the spheres of human reality. In this context, transhumanism appears as a tendency capable to take humanity to its own transcendence. Taking into account that some corporations or institutions of great social and economic importance (e.g. NASA, Google or the University of the Singularity) are already starting to invest in projects that facilitate the arrival of a post-human world, it is essential for humanity to consider the challenges that this movement implies.

In this article, we take as a starting point the heterodox but consolidated tendencies that are grouped according to their position, for or against, when transcending humanity, namely transhumanists and bioconservatives, with the aim of propose some of the arguments that are today on the table. Hence, the first step to acquire the required consciousness to reach the understandings of the transhumanist phenomenon is to maintain a constructive, argued and peaceful debate. However, in a scenario of a non-agreement on the required consensus about the limits of transhumanism, there is a certain possibility that humanity will stop using technology as a means to put itself at the service of its logic.

To focus this brief communication about the transhumanists and bioconservatives arguments, we will first establish and contextualize this movement, as providing and commenting some of the motivations of both sides from several lectures. Then, from an axiological point of view, we will offer a critique of transhumanism and, finally, we will provide some conclusions.

KEYWORDS: ethic, cyborg, freedom, technology, transhumanism, transcendence.

1. INTRODUCTION TO THE TRANSHUMANIST COSMOVISION

Transhumanism (H+) throws out the idea of overcoming and transcending the human being. Although this phenomenon seems to be exclusively a product of a hyper-technological society, the reality is that we can find the roots of transhumanism in the glimpses of transcendence that our ancestors already had at the origins of civilization. We must not forget that funeral rituals constitute a milestone for humanity, since they imply the conception of death (a unique characteristic of our species) and the belief in an afterlife. Therefore, it is no coincidence that, already in Mesopotamia, we find stories such as the Epic of Gilgamesh, in which a mention of immortality is made: "There is a plant... like a boxthorn, whose thorns will prick your hand like a rose. If your hands reach that plant you will become a young man again. Hearing this, Gilgamesh opened a conduit and attached heavy stones to his feet. They dragged him down, to the Apsu they pulled him. He took the plant, though it pricked his hand, and cut the heavy stones from his feet, letting the waves throw him onto its shores" (Carnahan, 1998, p.50). Immortality, which is one of the key elements of the Sumerian legend, is the same dream that, more than four thousand years later, transhumanism promises to make a reality thanks to scientific

progress. In this way, we see how the glimpse of eternity has always been part of the imagination, implicit in the human condition, as well as the will to translate those dreams into reality. However, all these dreams have been limited, until now, by the biological condition itself. Today, transhumanism, a product of the artificiality of civilization, will use technology to overcome biology and thus alter the course of nature.

Hence, it seems that the positions around the transhumanist debate are divided between the transhumanists and the bioconservatives. The former intend to abandon humanity to achieve, with the support of technology, a more perfect being (and apparently a better society). The latter position themselves against it and warn of the risks that certain actions may entail.

The human is not a definitive being. Actually, he never has been. The Darwinian theory of evolution explains how the little ape *Pliopithecus* has evolved into modern *Homo Sapiens*. In this way, Transhumanism states that the next evolutionary step, the one that will bring a new man, known as the *Homo Deus* according to Harari (Kiryat Atta, 1976), will also be the result of evolution, with the "small" change that this one will not be imposed by the biological logic, but will be in the hands of the technological rationality. If we think about it, the name *Homo Deus* is not presumptuous. Our ancestors prayed to the gods to take care of their crops after sowing or to provide health at birth to the child that mothers carried in their wombs (Harari, 2016). Today, we are already able to genetically manipulate seeds to obtain transgenic foods that resist pests better, produce more fruit and adapt to different climates and landscapes. Nowadays, man has even been able to create the first living machines (Kriegman, Blackiston, Levin & Bongard, 2020). One could say that, in some way, we are becoming Gods, since creation has ceased to be an exclusive property of the divinity to be shared with the human (or transhuman) subject: a being that will be able to create better beings and even to recreate himself. As we have been warning, overcoming the organic limits is essential to reach a post-human stage that escapes the biological frontiers to which the human condition is subject.

We should ask ourselves, in the event that the human being is transcended, what moral repercussions will it carry. That is, if we take into account that things are only good or bad in relation to the human being (Scheler, 2001), that is to say that any ethical assessment is subject to a human reference and that transhumanism tries to overcome the category of humanity, we can begin to elucidate in the complicated position that would remain the ethics in a transhumanist or post-humanist scenario. Many questions arise such as the following, to which we will briefly try to shed some light: "Who will not be tempted [in this new transhuman era] by the possibility of being always young and eternal? What if this depended on replacing our body and living eternally, within the networks of information, a virtual reality, as real as ours without the danger of dying? How many people will be willing to continue living even if only as a post body? And how many will die locked up in their obsolete body? [...] Will this be one of the most controversial ideologies in the future? If so, will there really be full freedom to modify and transcend our body? But if this were to have an economic cost, would it worsen the social imbalance, where superior bodies and simple mortals would coexist? Will the freedom of choice proclaimed by transhumanists depend solely on the purchasing power of each person?" Córdoba, 2007, pp. 611-612).

2. THE MOST AMBITIOUS IDEA EVER CONCEIVED

Youth, eternity, superiority or improvement are only some of the terms that are usually together with the transhumanist discourse. There is no doubt that its projects are ambitious. If we analyze the word on a semantic level, Transhumanism is composed of *trans* (prefix of Latin root that means "beyond of" or "on the other side of"), *humanus* (also of Latin root that refers to the human species), and *ism* (suffix of Greek root that implies a doctrine, belief or vital posture). In a synthetic way, and in consequence

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of its etymological approach, we understand that the H+ is a current that outlines the overcoming of the human being (arriving to a post-human state once the human condition has been overcome).

However, the limits to overcome the human condition are not clear. Moreover, the lack of precision of Fereidoun M. Esfandiary or F.M. 2030 (Brussels, 1930 – New York, 2000), the first to use the concept of Transhumanism in an instructive way, when clarifying them in his book, has not helped the scientific community. The author states that it is a human in transition, but without clarifying exactly where the limits of this transition are, nor what can be considered as a transition (beyond some general characteristics such as the use of prostheses, plastic surgery, intensive use of telecommunications or a cosmopolitan profile without any religious beliefs and with a rejection towards traditional values) (F.M. 2030, 1989). In any case, which is highlighted is the emergence of values such as dynamism, fluidity and change, which become essential in the Digital Revolution and that necessarily follows the transhumanist discourse.

On the other hand, we must also pay attention to the reasons that accompany the popularity of Transhumanism, since they also prevail in the will of any being that wishes to improve or transcend himself to become, even, eternal. Overcoming the terrible idea of death, which resonates in the head of any human being, is therefore also one of the main goals of Transhumanism. Bostrom (Helsingborg, 1973), one of the theorists of this movement, uses the metaphor of the Tyrannical Dragon to refer, precisely, to the desire to overcome aging and, thus, to kill the death.

His reasoning is the following: assuming that aging is the cause that generates more deaths on the planet (therefore attacking human well-being), it must be a (moral) priority of humanity to face and defeat the Tyrant Dragon that devours people (Bostrom, 2005).

It must be borne in mind that this desire to improve oneself is a characteristic that has always been intrinsic with the human being. In this way, transhumanists will try to correlate their particular vision of (technological) improvement to the human spirit. Therefore, we can observe in Savulescu (Melbourne, 1963) that "if these [genetic] manipulations improve our ability to make rational and normative judgements, they further improve what is fundamentally human. Far from being against the human spirit, such improvements express the human spirit. To be human is to be better" (Savulescu, 2009, p.428).

These manipulations will be carried out thanks to the relationship between several fields of knowledge that have been, so far, compartmentalized between each other. In this way, Transhumanism, which is only possible by the interconnection of the propitiated digitalization and technological implementation in different areas of knowledge, such as the NTBI (Nanorobotics, Technology of information, Biotechnology and artificial Intelligence), will point out towards the future with grandiloquent promises awaiting the next scientific advances, which are going to be capable to make them a reality, until we reach Posthumanity.

Hence, one of its most characteristic features is that, while other worldview, sensibilities, phenomena or movements have been inspired in the past to build their speech, Transhumanism denies the past to venerate the future. According to the predictions, an advanced and superior specie is going to replace humans as known in the present-day. As stated by Lafontaine (Canada, 1970), a new being, and therefore a new species, perhaps still biological but with built-in devices and technological elements, seems to be the destiny of today's society: "contemporary society, with its large contribution of technologies of the information and biotechnology, also has the hope of finally seeing the appearance of a new man, capable to adapt by his great flexibility to the whims of caprices of the communication flows" (Lafontaine, 2000).

The appearance of a being that has its origin in the cultural development, as a result of science and technology instead of the nature itself, has no precedent in the history of humanity. Without being able to make a comparison to keep a certain equivalence, it is necessary to comment that transcending the human being is going to represent, at least, a Copernican turn as great as the one that humanity took place during the Renaissance and culminated in the French Revolution. We are referring to the humanism that moved God from the center of the Cosmos to place the human in it (anthropocentrism). If Humanism put the man in the epicenter of the Universe, Transhumanism will displace him from it to give place to a new being (probably a human turned into God) that will appear from the human digitalization. Not in vain, it is fair to recognize that, despite the first change required several centuries to be implemented, the immediacy that characterizes technological devices can provide that this can happen in a few years.

Although it cannot be said that there is a human being who has transcended humanity, it is no less true that the cyborg has ceased to be exclusively part of science fiction. In Western society, it can already be seen how "the increasing variety and availability of models of prosthesis/artifacts that can be built-in in a body, either for functional and/or aesthetic purposes, will progressively transform the human body into a complex sum of artifacts, with an increasingly extensive interface between the technological and the biological, between the cybernetic and the organic, like in the futuristic creatures known as cyborgs, created by science fiction writers" (Koval, 2006, p.13). The reality is that humanity already has cyborgs (at least on a terminological level), since Harbisson (London, 1984) has been recognized as such for the British state. Harbisson was born with a congenital eye disease that prevented him from distinguishing colors except for black and white. After years of effort and study, he has managed to develop a functional antenna, which is integrated into the occipital bone of the cranium. This device has a sensor capable to capture frequencies of light and transform them into frequencies of sound. Thus, Harbisson is able to hear colors and even to detect infrared and ultraviolet rays, which are imperceptible to any human (Ledesma, 2018).

Therefore, it does not seem unthinkable that, if technological hybridization continues, there will be more and more people who will be considered as cyborgs because of their capacities, which are unachievable by the only means of the human condition. If so, although it will not be measured in a specific period of time, it is possible that the organic will be gradually replaced by the cybernetic. However, according to the transhumanists, we should not look with nostalgia the probable disappearance of the human being, since we should embrace the possibility of enjoying a life that reaches quotas of greater perfection (although terms such as "perfection" or "improvement" are somewhat abstract). Furthermore, given the Kurweil's Law of Accelerating Returns (1999), which points out that technological development is exponential, the transhumanist revolution is revealed to be unstoppable (Kurzweil, 2015). This is also considered by Baylis (Montreal, 1962) and Robert (?): "The development and application to humans of the technology for genetic improvement is inevitable. They constitute the next and definitive step of the evolutionary process of our species. All resistance is condemned to failure". In this way, the cyborg is not only the future for humanity, but also represents the last opportunity for it to not be left out of the post-human world that is already under construction.

It is also necessary to point out where this transformation will take place, which is none other than the body itself. Transhumanist ideas have spread at a time when the body is no longer conceived as a sacred temple (as in Greco-Latin culture) or as a source of sin (as in the Judeo-Christian tradition). As pointed out by Farrero (Barcelona, 1980) and Vilanou (Barcelona, 1953) (2016), "the body is a political setting for insurrection and desecration, as evidenced by the different experiences currently being carried out that take the body to the extreme of tattooing or piercing". Thus, in postmodernity, there is no major force to prevent the body from being alienated, modified, or even replaced for the benefit

of the subject himself. Hence, the human will cease to be human to reach post-humanity through the intervention and manipulation of the somatic. It is not possible, therefore, to embrace the benefits of Transhumanism without detaching oneself from the human condition. As F.M.2030 says, "if we want to extend each life far into future, we have to make radical changes. We cannot live for hundreds of years with these fragile limited bodies" (F.M.2030, 1989, p.201).

3. MORAL CRITICISM OF THE TRANSHUMANIST MOVEMENT

As aforementioned, several voices have arisen either to defend the postulates of the Transhumanism or to refute them. That is, the repercussion of this movement to the humanity is still unknown and, therefore, rejectable for several people. In this section, some of the challenges that are raised in an axiological level of H+, proposed by bioconservatives authors, are going to be discussed. F. Fukuyama described Transhumanism as the most alarming idea ever expected (Fukuyama, 2002), when considering it as a frontal attack to humanity (Fukuyama and Reina, 2002). The occidental society has a consensus about the Human Rights since there is an international acceptance of the fundamental premises such as the life dignity or the equality of lives.

Despite the diverse legislations of the different democratic cultures, which subject humanity to the rights, defend (to a greater or lesser extent) to abide these universal maxims, it must be borne in mind that the first fundamental right, indispensable to be able to exercise any other, is none other than the natural right to life. Taking into account that H+ directly modifies the human condition and life as understood today, it is also clear that it attacks the very dignity of the species. In addition, the breach of the right to a biological life is also the breakdown of the right to a proper and spontaneous identity resulting from a biological chance and from an extremely complex set of variables and conditioning factors. Trying to control and influence these variables implies directing a life, ergo violating its most intimate dignity: the freedom for each one to be what he or she must be.

Another argument at the axiological level, which revolves around identity, is given by Sandel (Minneapolis, 1953). He points out the pressure that will be placed on the future improved subjects, considering the expectation that we have foreseen in them, and the possible serious disappointments or even depressions that they will have if they are not up to the task (Sandel, 2015). Thus, we must contemplate the possibility that these improved future beings will rebel against the eugenic goals of their own designers, that these will not share the purpose of such improvement and, consequently, will not understand why they have been genetically manipulated. That being the case, we must keep in mind that a transhumanist individual can suffer serious disruptions of personal identity.

Moreover, as stated by Sandel, instead of continuing this commitment to improve humanity and eradicate any imperfection through the transhumanist channels, it would perhaps be more logical to use our efforts to create the conditions to enjoy a kinder world. In his own words, perhaps "Instead of using our new power to strengthen 'the twisted shaft of humanity', we should do everything in our power to create social and political conditions that are kinder to the gifts and limitations of imperfect human beings" (Sandel, 2015, pp.146-147). We must consider, then, that a transhuman future is a scenario without people with disabilities or functional diversity. Without entering into a complex debate, we did want to point out, at least, the same right of disabled people to decide their own future (in the same way as any other citizen) or over that of their future children. Would it be legitimate for the disease to be eradicated in order to improve the species? Does a person who is deaf (hereditary) not have the right to have a daughter, if they so choose, that will have the same disability?

The third argument that we want to comment is about equality. Even though the differences between humans are large and varied, they all share the same genetic condition. However, if H+ fractures with

this equality, the contrast between the intelligent species inhabiting the planet will be emphasized. In other words, part of a privileged population will be able to access to the biotechnological benefits, while others will not.

Hence, one may be concerning about the relationship between both communities: the transhuman (*Homo Deus*) and the human (*Homo Sapiens*). Will those who have broken the biological condition and those who remain tied to their mortality compete for the same oppositions and in the same competitions? Transhumanist development inherently implies an imbalance at the social level produced by those people who begin to access this type of technology. Harari indicates that, although it is impossible to determine under which parameters this relationship will be established, what can be known with exactitude is the present-day relationship between human beings and other species endowed with less intelligence than them, as are the animals (Harari, 2016). The future of the human being in a transhuman or post-human context does not seem very hopeful because, if the transhuman being has a similar treatment to the human as the one maintained between this and the animals, the human future can be that of subordination and subjugation.

Furthermore, it is also appropriate to comment that human life is based on certain coordinates such as space, time, life or death, among others. Taking into account the revolution, at all levels, that Transhumanism implies (blurring the borders between space/time and life/death), it is very difficult to imagine that the same values that today serve as a reference for humanity continue being those that mark a transhumanist society. This fact brings a special unpredictability to the transhumanist movement that, in the worst case, can make it turn towards unsuspected parameters, perpetrating inconceivable tragedies. This is the reason why it can be dangerous to leave transhumanist experimentation in the exclusive hands of technicians or scientists, since, as we have been saying, the consequences of these are far-reaching for all of humanity. The same way is how Arendt (Hannover, 1906 – Nova York, 1975) understands it, when he warns that "the only question that arises is whether or not we want to use our scientific and technical knowledge in this sense, such a question cannot be decided by scientific means; it is a political problem of first order and, therefore, cannot be left to the decision of professional scientists or politicians" (Arendt, 1993, p.15). Thus, the possibility of democratizing decisions on technological developments is on the table. In this sense, Diéguez (Málaga, 1957) opens up the possibility of subjecting Transhumanism to an ethical framework affirming that "technological development can be controlled by means of an appropriate technological policy and by conditioning it to accepted values" (Diéguez, 2017, p.68).

Another of the theses concerns around freedom. As Panikkar suggests, we must understand technology as the science of control (Panikkar, 1991). Assuming that Transhumanism will integrate technology into the human biology, we must consider the possibility of encountering our freedom restricted. The hypothesis of a transhumanist dystopia has already been widely exploited in literature in works such as *New Brave World* (A. Huxley, 1932) or *1984* (G. Orwell, 1949), in which hypertechnological realities are constructed where subjects experience a limited freedom. Although in our society it is far from the worlds conceived by Orwell or Huxley, certainly the big technological companies (e.g. Apple, Samsung, Microsoft, IBM or Tencent Holdings) are starting to create programs that are capable of managing the data of millions of people, establishing new forms of domination. Here is an example if this that we are commenting: It was March 17, 2018 when journalists Cadwalladr (Tauton, 1969) and Graham-Harrison (London, ?) (2018) of *The Guardian* newspaper, made the following news public: "Revealed: 50 million Facebook profiles harvested for Cambridge Analytica in major data breach". This reveled the misappropriation of data (which would later be used in Donald Trump's election campaign to win the US presidency) by Cambridge Analytica, with information that would have been provided by Facebook.

With this being only one example, we must certainly take into account the possibility that, as human beings become more dependent on technological devices, these will diminish our freedom. Considering the reflections of Kant (Königsberg, 1724 – 1804) about the Illustration, freedom is defined as the overcoming of the man to the under-age (Kant, 2009) due to, precisely, the autonomy and freedom that have been acquired. Thus, it is appropriate to assume the paradox that Transhumanism can return the man to this under-age stage by removing the tools that have allowed him to think for himself. In the same line, Sandel rejects the transhumanist approach "because it manifests and promotes a certain attitude towards the world: an attitude of control and domination that does not recognize that gift character of human capacities and achievements, and forgets that freedom consists in a certain sense in a permanent negotiation with what has been received" (Sandel, 2015, p.137).

The last of the criticisms that we wanted to consider is about the irreversibility of transhumanist actions. We must not forget that there is no turning back in the biotechnological revolution that Transhumanism encloses, as it seeks to "dominate the territory of human 'natural nature' and of the entire biosphere, preserved so far in biological unity and cultural diversity, to transmute it from a radical and irreversible way into a biological-genetic-neural-factual diversification and into a paradoxical cultural uniformity" (Linares Salgado, 2018, p.86).

This is why prevention is a fundamental element in order to avoid future disasters, being necessary, also in relation to the argument that demands a democratization of technological advances, the "creation of conditions around which not only it is possible to control the freedom of choices that involve the modification or programming of the human beings, but also it is plausible that, if this is done, there will be measures of containment that allow us to become aware of what kind of programming we want for us" (Cardozo and Cabrera, 2014, p.86).

4. CONCLUSION

We would like to end this article by addressing two conclusions. Firstly, we would like to acknowledge that any change at a social level requires, previously, a change of awareness from the society. In this sense, the battle over technological hegemony has already begun and both the scientific discourse and human reality are gradually impregnated with the growing technological assimilation. It is not a minor matter that many of the spheres of human activity are already filled with applied sciences nor that our society venerate innovation, dynamism or consumerism, since these are the same values that will facilitate the arrival of Posthumanism.

Thus, it can be assumed that our behavior, our language or our reasoning are already being highly influenced by transhumanist postulates. A clear example can be seen in the concept itself and in its own antonym. The word *transhmanist*, chosen by the followers of this current, implies a series of positive connotations. On the other hand, if we refer to the antagonist word, *bioconservative*, the name evokes a certain perception of antiquity or something retrograde. It is necessary to highlight in order to get an idea as faithful as possible, that while transhumanists chose the name used by Huxley and recovered by Esfanidary, *bioconservative* is the alias, clearly derogatory, that transhumanists have imposed. Seeking new concepts on which to build discourses is therefore a prerequisite before starting the debate on ethical conditions; otherwise, battles will have been lost even before the start of the war. To conclude, then, we suggest another concept, *biovitalism*, on which to build a discourse and an alternative narrative to H+.

In an axiological sense, the morality on which law is based, depending on the ideal of what is right in accordance with a tradition, is undergoing an axiological transfiguration, consequence of the Digital Revolution, which facilitates the emergence of new values, such as efficiency, capability, adaptability

or innovation. Moreover, in the same way that new values appeared due to the Industrial Revolution, such as obsolescence, the Digital Revolution and, later, the Transhumanism, will give birth to new axiological constructs, as long as humanity is present to provide them some value.

In addition, we would like to discuss the need to dissociate from the human progress what is strictly a technological and scientific advance. Although technology has improved the life of human beings on countless occasions, it has also led to some headaches. To give just one example, without scientific progress, climate change and its consequent environmental disasters (due to bad practices in the extraction of materials or the pollution of industries that manufacture the devices), would not be one of the biggest challenges to be globally tackled in the present-day. It is therefore necessary to denounce the falsehood that technological progress is positive regardless of whether it must be conditioned by ethical or democratic criteria in order to submit Transhumanism to other filters beyond economic or scientists.

REFERENCES

- Arendt, H. (1993). La condición humana (Vol. 306). Barcelona: Paidós.
- Baylis, F., & Robert, J. S. (2004). The inevitability of genetic enhancement technologies. *Bioethics*, *18*(1), 1-26.
- Bostrom, N. (2005). The fable of the dragon tyrant. Journal of Medical Ethics, 31(5), 273-277.
- Cadwalladr, C., & Graham-Harrison, E. (2018). The Guardian. Revealed: 50 million Facebook profiles harvested for Cambridge Analytica in major data breach, 17/3/2018. Retrieved from https://www.theguardian.com/news/2018/mar/17/cambridge-analytica-facebook-influence-us-election [Data de consulta: 24/10/2019]
- Cardozo, J. J., & Cabrera, T. M. (2014). Transhumanismo: concepciones, alcances y tendencias. Análisis. Revista Colombiana de Humanidades, 46(84), 63-88.
- Carnahan, W. (1998). The epic of Gilgamesh. Electronic Edition. Retrieved from https://uruk-warka.dk/Gilgamish/The%20Epic%20of%20Gilgamesh.pdf
- Córdoba, S. (2007): *La representación del cuerpo futuro* [tesis doctoral], Madrid: Universidad Complutense de Madrid. Retrieved from http://biblioteca.ucm.es/tesis/bba/ucm-t29917.Pdf
- Diéguez, A. (2017). Transhumanismo. La búsqueda del mejoramiento humano. Barcelona: Herder.
- F.M. 2030. (1989). Are You a Transhuman? Nova York: Warner Books.
- Farrero, J. G., Ortega, G. T., & Vilanou Torrano, C. (2016). El deporte europeo en la crisis del siglo XX. Un palimpsesto posmoderno. *Ars Brevis*, (22), 304-351.
- Fukuyama, F., & Reina, P. (2002). *El fin del hombre: consecuencias de la revolución biotecnológica*. Barcelona: Ediciones B.
- Harari, Y. N. (2016). Homo Deus: breve historia del mañana. Madrid: Debate.
- Kant, E. (2009). ¿Qué es la Ilustración? Foro de Educación, 7(11), 249-254.
- Koval, S. (2006). Androides y posthumanos. La integración hombre-máquina, Diego Levis, sin número de publicación, 1-22.
- Kriegman, S., Blackiston, D., Levin, M., and Bongard, J. (2020). A scalable pipeline for designing reconfigurable organisms. *Proc. Natl. Acad. Sci. U.S.A.* 117, 1853–1859.

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- Kurzweil. R. (2015). La singularidad està cerca. Cuando los humanos trascendamos la biologia. Madrid: LolaBooks.
- Lafontaine, C. (2000). La cybernétique matrice du posthumanisme. Cités, 4, 59-71.
- Ledesma, E. T. (2018). Construcción de una Tipología de las Formas Tecnológicas de Vida. El caso del cyborg Neil Harbisson. Congreso Internacional de Tecnología, Ciencia y Sociedad. Lisboa.
- Linares Salgado, J. E. (2018). De la naturaleza a la tecnoespecie: La proyección antropotécnica de la condición humana. Contrastes: revista internacional de filosofía, 23(2), 77-95.
- Panikkar, R. (1991) El "tecnocentrisme". Algunes tesis sobre tecnologia. Barcelona: La Llar del Llibre.
- Panikkar, R. (1991). El tecnocentrisme, algunes tesis sobre la tecnologia, en la nova innocència. Barcelona: La llar del llibre.
- Sandel, M. (2015). Contra la perfección. Barcelona: Marbot Ediciones.
- Savulescu, J. (2009). Genetic interventions and the ethics of enhancement of human beings. *Readings* in the Philosophy of Technology, 417-430.
- Scheler, M. (2001). Ética. Madrid: Caparrós Editores.