ALEXEY DODSWORTH MAGNAVITA DE CARVALHO

SKYWARD
Ethics and Metaphysics of Transhumanism: a proposal

This thesis is presented for the dual-title degree of Doctor of Philosophy. Universidade de São Paulo (Brazil) and Università Ca' Foscari (Italy).

Supervisors: Prof. Dr. Renato Janine Ribeiro (Brazil) and Prof. Dr. Fabrizio Turoldo (Italy).

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ABSTRACT

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This thesis - of nomothetic nature - advocates in favour of a cosmically expanded humanity, as proposed by transhumanists in the first topic of their *Declaration* published in 1998: *we envision the possibility of (…) overcoming (…) our confinement to planet Earth*. In order to accomplish this purpose, two topics are considered: (1) *ethics*, in which the Hobbesian concept of *summum malum* is surpassed in order to agree with the Hans Jonas's statement: if we can say there is a supreme evil, it is the eventual extinction of the human species. Therefore, in order to avoid the Jonasian *summum malum*, this thesis proposes the biocosmic expansion as an imperative based on zoocentric bioethics; (2) *metaphysics*, in which an exercise of cosmogonic supposition – as proposed by Jonas - is taken into account, and the humankind is seen as a way that the cosmos found to understand itself not in a single scenario but in multiple universes.

Keywords: summum malum; space colonisation; mass extinction; transhumanism; terraforming; many worlds interpretation; bioethics.

RESUMO

DODSWORTH-MAGNAVITA, A. **Rumo ao Céu – Ética e Metafísica do Transumanismo: uma Proposta**. Tese (Doutorado, dupla titulação). Faculdade de Filosofia, Letras e Ciências Humanas, Universidade de São Paulo; Filosofia e Scienze della Formazione, Università Ca' Foscari di Venezia. 2019.

A presente tese, de natureza nomotética, advoga em prol de uma humanidade cosmicamente expandida, conforme proposto por transumanistas no primeiro tópico de sua *Declaração* publicada em 1998: *nós vislumbramos a possibilidade de (...) superação (,,,) de nosso confinamento ao planeta Terra.* De modo a cumprir este propósito, dois tópicos são considerados: (1) *ética*, no qual o conceito hobbesiano de *summum malum* é ultrapassado de modo a concordar com a declaração de Hans Jonas: se podemos dizer que existe um mal supremo, este é a eventual extinção da espécie humana. Logo, de modo a evitar o *summum malum* jonasiano, a presente tese propõe a expansão biocósmica como um imperativo baseado em uma ética zoocêntrica; (2) *metafísica*, no qual um exercício de suposição cosmogônica – conforme proposto por Jonas – é levado em consideração, e a humanidade é vista como um caminho que o cosmos encontrou para entender a si mesmo não em um único cenário, mas em múltiplos universos.

Palavras-chave: summum malum; colonização espacial; extinção em massa; transumanismo; terraformação; interpretação dos muitos mundos; bioética.

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Aprovado em:

Banca examinadora:

Prof. Dr._____ Instituição:_____

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Initial Considerations

Tis true without lying, certain and most true.
That which is below is like that which is above,
And that which is above is like that which is below,
To do the miracles of one only thing (…)[1]

The ontology of humankind is also the ontology of the skies. The ties that bind them together are inextricable to such a degree that changes in one incur in a profound transformation of the other as in a mutual reflection.

This thesis is a development of my master's degree research on ethics from a number of perspectives. Before defending the thesis itself, I find it necessary to present a brief summary of the dissertation that precedes it, so as to shed a light upon my original standpoint and my ultimate outcome.

The dissertation[2] presented at University of São Paulo (Brazil) tries to demonstrate that the paradigm shift in cosmology that occurred between the centuries XVI and XVII contributed significantly to the epistemic transformations described by Michel Foucault (1926-1984) in *Les Mots et Les Choses* (1966). In this book, Foucault poses the question: how did the dramatic epistemic shift occur in the West? As Foucault does not provide any answers, I attempted to propose one, taking the following into account:

The ancient epistemology is underlined by an Aristotelian-Ptolemaic cosmology, which divided the cosmos in two worlds. The *sublunar* one, home of becoming as well as of corruptible matter and the *superlunar* one, characterised by its immutability and eternal elements having neither beginning nor end. Consequently, this architecture of the astrological sky guaranteed the existence of a meaning that, in addition to preceding humankind, also unveiled in the configurations of the celestial sphere. The world, place of becoming, was viewed as the product of a divine will, which would have created everything in a beautiful and flawless manner. The symbolic interpretation of the heavenly positions conveyed the designs of the intelligent creator[3]. To glimpse the starry sky was, therefore, to contemplate aprioristic essences. This link between the heavens and humankind was paramount

[1] Hermes Trismegistus, ***Emerald Tablet***. Translated from the original in Latin by Isaac Newton.
[2] DODSWORTH-MAGNAVITA, Alexey (2013). *From Sky to Genes*. (Master's Thesis, USP),. Available from: http://www.teses.usp.br/teses/disponiveis/8/8133/tde-29012014-105129/pt-br.php. (2018, October 23)
[3] As contended by Julius Firmicus Maternus (306-307), in *Matheseos Libri VIII.*

to form the Christian ethics of resignation and tolerance, predominantly in the first five centuries of Christianity. Even the matters then regarded as monstrous were nonetheless seen as part of the celestial norm.

The aforementioned ethics undergoes a dramatic transformation between the centuries XVI and XVII. As put forward in my master's dissertation, this was due to the cosmological revolution led by Copernicus, Kepler, and above all by Galileo. The celestial bodies - then regarded as "spheres of ether" - were unveiled in all their unexpected becoming and all the banality of the elements composing them: the Moon, with its craters and mountains steeper than terrestrial ones; the planet Jupiter, surrounded by other moons in its orbit. Upon the realisation that the celestial spheres were as irregular and subject to the becoming as our own world was, the macrocosmic harmony of the astrological sky - organised, harmonic, eternal - gave way to a sky without any aprioristic essence: an astrophysical cosmos - imperfect, irregular, threatening.

As our knowledge of astrophysics evolved, there was a change in the sense of wonder (*thaumázein*), the starting point of the whole of philosophy. Our wondrous awe before the stars above us was replaced by a terrifying dread. We were faced with a sky that not only no longer offered the guarantee of eternity, but also loomed with its menacing celestial bolides, gamma ray explosions and other mass extinction phenomena.

It has been this shift of perspective regarding the skies that gave rise to the concept of *abnormal*, a non-existing term in ancient times and hence, non-applicable. The word "normal", however, was used though only in its geometrical sense: a vertical straight line that meets a perpendicular horizontal one, symbol of the divine will (vertical line) that rules over the world of becoming (horizontal line). As pointed out in my master's degree dissertation, the word "anomaly" was used for the first time to refer to irregularities in the position of the planet Mars, once the mathematics of the time did not allow for the precise position of the red planet to be known. The concept of "anomaly" gradually found its way into the field of biology, the field of medicine and finally, by the XIX century, it could also be found in the fields of psychiatry and psychology. There were now abnormal bodies and abnormal beings to be rectified due to the lack of a macrocosmic harmony to ensure everything was within a norm. Our different understanding of the sky led to a different understanding of humankind. It had gone from a very characteristic ancient Christianity ethic of

tolerance that stated: "*This is foreign or weird to me, but given that it is, it can only have come into being out of divine will and therefore it is justifiable by some celestial design*" to an ethic of rectification that is put into works by use of technical knowledge and which states: "*This is foreign or weird to me; what means do I have at my disposal to fix such strangeness?*"

While in my master's dissertation the scope was limited to a description of what had transpired during such process, in the present thesis, I will discuss the contemporary framework of ethics and its possible future outcomes. I intend to illustrate the emergence of yet another transformation in ethics, which equally stems from a change in the way humankind regards the skies. Whereas in antiquity the *astrological sky* is phased out to have the *astrophysical sky* introduced instead, we now bear witness to the introduction of the paradigm of the *astronautic sky*, a shift that has been underway since the second half of the XX century. Moreover, the debate around life is now reconstituted as *astrobiology,* which no longer understands our world as being separate from the remainder of the universe.

In this new relationship with the stars, knowledge and technical power allow human intelligence to redesign the species as *transhumanity*. The *homo sapiens* then gives way to the *homo faber*, whose technique makes possible to invade what were previously the unreachable skies. The human cities have long constituted a *topos* where humans make use of their technology to seek shelter from the inclement elements and to have a circumscribed space to live a happy life. Notwithstanding, such knowledge and technical power also incurred in the unstoppable growth of these former self-contained realms in such a way that there is no territory we cannot occupy. Thus, removed from its sanctity, the skies had their veil lifted to reveal a territory as ordinary as any other, one that also stands as the promise of the continuity of life in other forms and even of a transformation of our current understanding of "life" itself.

All things considered, this thesis is divided into two chapters:

The first chapter encompasses a thorough study of this new ethical system, based on the transhumanist movement, which I define as *biocentric but not geocentric*, and call the *ethic of desperation*; the second chapter contemplates a metaphysical hypothesis derived from Jonas' cosmogonical suppositions regarding the divine wager, and this supposition serves as a basis for the ethical system this thesis propounds.

Throughout the chapters, I especially and foremost derive my contentions from the work[4] of the German-born Jewish philosopher Hans Jonas (1903-1993), since his legacy holds particular value toward ethics, especially concerning his plead for the extreme emergency of developing a new ethics that may account for transhumanism. As a matter of fact, the ethic of despair here described bears resemblance to the *heuristics of fear* asserted by Jonas. I do highlight, however, that the present work does not portend a perfect alignment with the whole of Jonas's proponents. As I made an effort to demonstrate, there are a number of issues critical to the matter at hand that, had them been known or taken into consideration by Jonas, might have led him to draw different conclusions.

This thesis thus leans on Jonas's works, albeit parting from the philosopher's ideas in some regards, as its interest is to further contribute with some original thought. Which is, incidentally, the ultimate goal of a doctoral thesis: not to echo previously uttered words simply by rephrasing them, but to aim at broadening the already existing perspectives. Thereby allowing future generations to follow suit, feeling at liberty to either extend or refute whatever ideas are put forward here.

[4] Namely *Das Prinzip Verantwortung: Versuch einer ethic für die Technologische Zivilisation* (1979), translated from German to Portuguese by Marijane Lisboa and Luiz Barros Montez, PUC-Rio (2006).

1. The imperative of biocosmic expansion – an ethical proposal.

1.1. Transhumanists against the Jonasian *summum malum*.

In this thesis, the main proposition is in alignment with the first topic of the *Transhumanist Declaration*[5], which advocates among several points the expansion of consciousness toward the outer space, and the proliferation of life beyond planetary boundaries. According to the topic,

> **(…) We envision the possibility of broadening human potential by overcoming aging,[6] cognitive shortcomings, involuntary suffering, and our confinement to planet Earth (VITA-MORE et al: 2013: pg. 54).**

A post terrestrial humankind (or transhumanity) is here defended as able to deal with the concept of *summum malum*, in accordance to Hans Jonas perspective: the extinction of the whole of the human species is the actual supreme evil to be avoided (JONAS: 2015: pg. 83-88). The Jonasian perspective is significantly expanded in comparison to the Hobbes[7]'s, who in turn defines: *the supreme evil to be avoided is the violent death*[8]*.*

It is possible to contend that the Hobbesian restriction to the *summum malum* regarding an individual's violent death derives from the fact that the concept of "species extinction" was practically non-existent during this philosopher's lifetime. Even the religious version of catastrophism that was in vogue during Hobbes' time – Noah's flood – did not make mention of extinct species, only of individuals - both human and non-human animals - who met their demise in the water and humankind was far from knowing what a dinosaur was. It is therefore understandable that Hobbes had not imagined something worse than the individual violent death.

This thesis argues for the extreme urgency of a new ethic that lays out criteria for actions centred around the goal of avoiding the Jonasian *summum malum*. This ethic is driven by a generous non-reciprocal care, since it goes as far as stating the prevalence of the welfare of future generations before our own. (JONAS: 2015: p. 72-

[5] The current *Transhumanist Declaration* consists in a series of eight topics. It was originally crafted in 1998 and has been modified by several authors over the years.
[6] Underlined by me.
[7] Thomas Hobbes of Malmesbury (1588-1679), English philosopher.
[8] Free translation from the original in Latin: *Mortem violentam tanquam summum malum studet evitare*. HOBBES. *De Homine*, chap. 11, art. 6.

73). If the concerns and solutions presented here sound like science fiction, it is because this thesis considers Jonas's suggestions about the importance of taking fictional speculations seriously. The warnings proposed here may sound strange in current times, but are undoubtedly important in the long run (JONAS: 2015: p. 74).

Despite being in accordance with the Jonasian concept of *summum malum* and in agreement with the assertion that an individual entity's violent death constitutes a *minus malum*, this thesis mainly parts way with Jonas' view pertaining what the philosopher calls "the element of wager in human acting". The argument presented here is that the most probable scenarios should be given precedence over an endless cluster of possible conjectures as a guide for an ethical action. In considering every conceivable risk, one would choose not to take any action before the sheer multitude of possibilities, in contradiction with the fact that the species extinction is the *summum malum,* which presents itself not as a matter of a hypothetical "if", but as a matter of the certain "when", given our restriction to planet Earth.

However, it is understandable that the Jonasian proposition of a heuristic of fear be limited to the risk of destruction led by humans. Let us consider the context: Jonas' mother died in the concentration camps of Auschwitz and he bore witness to the attempt to exterminate the Jewish people; moreover, he also witnessed the cold war and the rise of the nuclear threat. If the Jonasian *summum malum* exceeds the Hobbesian one, it is due to the fact that in Hobbes' time it was inconceivable that a ruler - no matter how insane - could be capable of exterminating an entire ethnic group or a whole group of other species. Nevertheless, while the Hobbesian *summum malum* is seemingly restricted to the philosopher's ignorance of species extinction, the Jonasian version also seems limited to the *uniformitarian paradigm*.

Throughout the XIX century, uniformitarianism – as defended by Lyell[9] - prevailed as the doctrine that explained the terrestrial geological transformations, serving as an alternative to the religious belief in a diluvian catastrophism. Broadly speaking, uniformitarianism postulated that the changes on the planetary surface were the result of gradual processes whose agents were not unusual, such as rain, snow, the erosion caused by the winds and so on. Based on his geological studies, Lyell concluded there was nothing to support the belief in the successive

[9] Charles Lyell (1797-1875), Scottish geologist.

development of animal and vegetable life. Every being that ever was would have existed in every Earth era, and if a few had gone extinct, that would have been the result of slow processes such as lack of food, for instance (LYELL: 1990: pg. 123). In its time, uniformitarianism had deep implications in Darwin's work[10], leading him to the conclusion that extinctions always happened at a very slow pace, even slower than the rise of a new species (DARWIN: 1964: pg. 84). It is true that Darwin contradicted Lyell by pointing to the emergence of new species due to evolution and yet, both agreed that the phenomenon of extinction occurred gradually and related to the lack of resources, some sort of geographical restraints, which consequently led to the number of individuals dwindling. Darwin and Lyell's successors remained in keeping with the uniformitarian idea of slow extinction, even when it came to dinosaurs and other pre-historical animals so that science entered the XX century envisioning only one agent capable of causing sudden extinction: the human type.

It was only in the later 70s of the XX century that humankind was presented with the existence of events of global extinction caused by extraterrestrial forces. This knowledge was obtained in the outskirts of the Italian town of Gubbio in a place known as Gola del Bottaccione thanks to Walter Alvarez[11] noticing how abruptly the species foraminifera seemed to have disappeared considering their fossil presence in the different layers of the rocks. It was Luís Alvarez[12] (Walter's father) who suggested dating the clay in Gubbio and ended up detecting this extraordinary amount of iridium in the samples (ALVAREZ: 2000: pg. 69). It just so happens that iridium is an extremely rare element on the terrestrial surface, albeit highly abundant in meteorites. Understanding they had an anomaly in their hands, the Alvarezes decided to analyse the dirt of other geological sites where species seemed o have disappeared suddenly and detected the same abnormal presence of iridium. In June 1980, the Alvarezes's article was published on *Science* under the title *Extraterrestrial Cause for the Cretaceous Tertiary Extinction*. The impact of this publication quickly spread beyond the realms of geology, positively influencing other fields of knowledge such as astrophysics[13], while also facing the fierce resistance of many scientists of the time, as can be confirmed in an article entitled *Miscasting the Dinosaur's*

[10] Charles Darwin (1809-1882), English naturalist, biologist, and geologist.
[11] Walter Alvarez (born in 1940), American geologist.
[12] Luís Walter Alvarez (1911-1988), American physicist, Nobel prize in Physics (1968).
[13] Inspired by the Alvarez' article, the American astrophysicist Carl Sagan (1934-1996) lead a team to model the effects of a nuclear war and conceived the concept of "nuclear winter" as a result.

Horoscope[14]. This and other pieces in the media of the time like *Dinosaur Experts Resist Meteor Extinction Idea*[15] clearly show the extent to which science still stood by Lyell's Uniformitarian paradigm. A paradigm that ruled out any sudden change, even when confronted with evidences to the contrary. Let us not forget Lyell himself was perfectly aware of the sudden gap in fossil records. In his *Principles of Geology*, Lyell refers to an abrupt gap between fossil strata found in rocks of the end of the Cretaceous and the beginning of the Paleogene. According to Lyell, it was *impossible and non-philosophical* to suppose that this abrupt rupture truly represented a sudden change to the order of things and that such suppression was most likely due to a fault in the fossil records (LYELL: 1990: p. 328, v. 3). Darwin was also well aware of the sudden change in the fossils in the later part of the Cretaceous and, just like Lyell, he attributed this to a fault in the records, interpretation that can be found throughout his *On The Origin of Species.*

If nowadays science has already surpassed the uniformitarian paradigm and understands Earth's history as a combination of both uniformitarianism and neocatastrophism, still bioethics remains predominantly confined to a concern regarding the dangers of the human technological action, and neglects the fact that extinction is not an anomaly exclusively introduced by human intelligence, rather, it is a component of the erratic course of nature itself. Despite the present thesis being in unison with Jonas' definition for the *summum malum*, our disagreement lies on the procedural recommendations. Jonas is mainly concerned with the dangers of technological action and although he is right in his caution, his concerns are limited by the context of his time. *Das Prinzip Verantwortung* is a 1979 work, published a year before the Alvarezes' article, whose impact took close to a decade to be absorbed by the most part of the scientific community.

As one of the strongest voices to take question with the unbridled technical progress and denounce the threat of disaster that comes with it, Jonas was a pioneer. His reservations in relation to technology are well substantiated by the fact that human action in the past need not be restrained by imaginative projections of possibilities. Whatever procedural blunders our ancestors made did not incur in irreversible consequences and hazard was, at most, brought upon the confines of time-space boundaries. The same cannot be said about our technologically

[14] *The New York Times*. April 2, 1985.
[15] *The New York Times*. October 29, 1985.

empowered actions, whose oversights imperil not an isolated city but the very existence of humanity. It stands to reason that the possibility of extinction as the result of unrestrained technological development is unlikely scenario amidst the multitude of other possible scenarios and outcomes. However, this scenario belongs in a set whose probabilities could be altered by an ethical pact so as to reduce its likelihood. According to Jonas:

> **This reservation - that only the avoidance of the highest evil and not the pursuit of the highest good justifies, under certain special circumstances, that the interest of "others" is put at risk in its totality, for their own sake – does not offer support to justify the high stakes of technology. For these are not undertaken to preserve what exists or to alleviate what is unbearable, but rather to continually improve what has already been achieved, in other words, for *progress*, which at its most ambitious aims at bringing about an earthly paradise. It and its works stand therefore under the aegis of arrogance rather than of necessity (JONAS: 2015: pg. 85).**

Jonas is not wrong when he perceives technological progress as brimming with vanity more than being driven by necessity. Nevertheless, the scenario where life is wiped out is elevated in category from contingent to apodictic in the absence of such technological advances. Note that Jonas implies in the aforementioned excerpt that the stakes may be worth the risk were "to preserve what exists" (*id est*, humanity and other sentient beings) or "to alleviate what is unbearable" (the Jonasian *summum malum*: the collective extinction) the ultimate aim.

And yet, if the element of technological innovation is removed from the equation, the element of extinction ceases to be a mere possibility. It would then constitute a certainty. Jonas himself appears to be fully aware of Earth's natural lifespan lapse in his 1988 work[16] when speaking of the end of planet Earth as the result of natural cosmic events: the end of terrestrial revolutions, meteor collisions, death of the Sun, etc. Remarkably, Jonas seems not to apply his defence to an *unconditional duty to exist* (JONAS: 2015: pg. 86), nor does he deem the extinction of the human species unbearable as he refers to such facts of incontrovertible certainty - and that will cause complete annihilation. Here is what he has to say on cosmic disasters:

[16] *Materia, Spirito e Creazione*. Morcellana: 2012. Translated from German by Paolo Becchi and Roberto Franzini Tibaldeo.

> **We should not be terrified by this cosmic expiration: in this interval which has been conquered - for us of long duration - characterized by great articulations from the very wide extent, the *chances* lie precisely in what for us, and probably also for a divine observer, constitutes the meaning of all the cosmic adventure (JONAS: 2012: 35).**

Eight years stand between *Das Prinzip Verantwortung* and *Materie, Geist und Schöpfung.* Jonas does not express human extinction as the result of cosmic disasters is something to be feared in any of his works despite the fact that, as previously demonstrated, it belongs to the realm of absolute certainty and not that of mere contingency. At this point, the present thesis departures from Jonas. Even though the Jonasian ethic is not anthropocentric and does confer intrinsic worth not solely to humans, but to life, still it does not conceive the astronautic expansion of existence nor life's astrobiological dimension. Though Jonas does not define his ideas as anthropocentric, they are ecocentric - or *biogeocentric* even - wherein life and planet Earth are inseparable from each other. Jonas on contacting extraterrestrial intelligent entities:

> **This we do know: that with us and in us, in this part of the universe and at this moment of our fateful power, the cause of God tremble in balance. What does it matter to us whether somewhere else it prospers or is endangered, is rescued or squandered? That our signal going out somewhere or other in the universe may not be a death notice- with this we have enough on our hands. Let us concern ourselves with our Earth. Whatever might exist out there, here is where our destiny is decided[17] — and, along with our destiny, that share of the wager of creation which lies in our hands can either be preserved or betrayed. Let us care about it as if we were, in fact, unique in the universe (JONAS: 1996: pg. 197).**

According to the aforementioned excerpt, Jonas calls us to look after our own world as a precaution *that our signal (...) may not be a death notice*. As for how we can fend off our own extinction, given the fact that life has been so far intertwined with Earth, Jonas offers no perspectives. It is even possible to infer from this text that such extinction is not to be fended off, once, in the words of the philosopher *here is where our destiny is decided*, considering that Earth is not without an end and far from immune to cosmic interference. In establishing humanity's destiny as interwoven with the planet's, one has to passively comply with its indubitable future extinction, which is diametrically opposed to what Jonas himself advocates in stating that *an*

[17] Excerpt underlined by me.

unconditional duty for mankind to exist, and it must not be confounded with the conditional duty of each and every man to exist (JONAS: 2015: pg. 86).

If Jonas' perspective on the *summum malum* states it as the extinction of the human species it makes no sense to settle for Earth as our destined residence. Forasmuch as our world has an expiration date regardless of human action, the *summum malum* may only be avoided by means of technological actions that aim at expanding humanity and other life forms beyond their own shape and terrestrial constraints, as contended in this thesis. It is also the burden of this paper to offer *an astronautic dimension to existence*.

Jonas took a huge and necessary step by attracting notice to the relevance of a non-anthropocentric ethic. We must, however, take one more step ahead toward a Copernican revolution of ethics, wherein the Earth is a cradle and worthy of care, but does not constitute centre or final destination and is instead regarded as a starting point. We are far more likely to avoid the *summum malum* by spreading throughout the galaxy and serve our purpose as *distributors of the gift of life*. No other species detains the power and knowledge to accomplish this feat of – to use a Jonasian term - non-reciprocal generosity.

It is thus necessary to extend far beyond Jonas' concerns. It is not only the human technological action that should worry us, but also the unjustified human inaction in light of the scientific knowledge we currently detain. This is an immoral inaction that imperils more than the whole of humankind, but it puts at risk all life on Earth as well.

The expansionist and transhumanist endeavour proposed here is nothing like that of the first space run and its purposes, inasmuch as it worked within the framework of the cold war and was grounded on sentiments of vanity and competition. This proposal is above all about survival, and its first policy should be the creation of a space guard programme in order to protect the planet against cosmic menaces. Although science fiction does not intend to guess the future, there is in it a truth more powerful than reality.

For example: Clarke[18]'s *Rendezvous with Rama* seriously warns us regarding all this. The story begins with a great moral criticism on our tendency to act only when it is too late. Clarke starts by describing some real cosmic events that

[18] Arthur C. Clarke (1917-2008), British scientist and sci-fi author.

happened in our recent past. By remembering the meteorite that fell in Tunguska on June 30, 1908, he emphasises how vulnerable we are, given that *Moscow escaped destruction by three hours and four thousand kilometres – a margin invisibly small by the standards of the universe* (CLARKE: 2011: pg. 8). He also remembers the Sikhote-Alin meteorite falling close to Vladivostok in 1947 *with an explosion rivalling that of the newly invented uranium bomb* (CLARKE: 2011: pg. 8). It is quite clear that we are at the mercy of random cosmic events. We do not take serious measures regarding a space guard programme because we have not yet been hit in a way that really hurts us. So in order to demonstrate how random and indifferent the universe is, Clarke offers us a drastic fictional scene in which northern Italy is totally destroyed by thousands of tons of rock and metal falling from the sky. He writes:

> **The cities of Padua and Verona were wiped from the face of the Earth; and the last glories of Venice sank forever beneath the sea as the waters of the Adriatic came thundering landward after the hammer blow from space. Six hundred thousand people died, and the total damage was more than a trillion dollars. But the loss to art, to history, to science – to the whole human race, for the rest of time – was beyond all computation (CLARKE: 2011: pg. 9).**

Thanks to that trauma, mankind reacts by saying there will be no next time, and so the "Project Space Guard" arises. Clarke's warning is quite clear from the very beginning of the book: *Sooner or later, it was bound to happen* (CLARKE: 2011: p. 8). This thesis sustains Clarke is right, therefore is our moral obligation to act in anticipation against the human extinction. It would be better to act in anticipation than merely reacting.

Although environmental ethics is being taken more and more seriously, it is still quite unusual for philosophers to address themes that go beyond the terrestrial context. The act of visualising the Earth as if it were within a shielded box with no interactions with cosmic space is a common misconception. In fact, people do tend to visualise themselves as living inside a box whose transparency merely allows the entrance and escape of light and heat. Until now, the major cosmic environmental concern regards the problem of space debris orbiting our planet. But the planet Earth is not a closed system. Common knowledge tends to be easily misled by the false idea of planetary stability. As said before, our planet has suffered events that cause global extinction, which were triggered by extraterrestrial factors that caused the extinction of more than 75% of the species. There is no guarantee - and we should

not even act as if there were one - that cosmic extinction events will not recur.

Moreover, the very idea of "cosmos", taking the meaning of the Greek term that refers to "order" and "beauty", is somewhat illusory. In so many ways, common knowledge still lives under the idea of an Aristotelian macrocosmic harmony – the comfortable belief in an everlasting world.

1.2. *Trasumanar*: from Dante to Huxley.

Despite its recent ascent as an organised movement in human history, transhumanism and its dearest propositions may be traced back to ideas postulated by ancient thinkers who could be considered proto-transhumanists. In order to understand this movement, it must be clarified that many of its claims[19] are strongly paralleled with ancient mystical mythopoetics.

As a matter of fact, “transhumanism” is a term probably used for the first time by Dante [20] in *La Divina Commedia* in order to express a kind of human transcendence towards God. Since there was not a proper term to express his mystical experience in Heaven, Dante coins the neologism *trasumanar*. In English, an acceptable translation from the Dantesque original could be: *Transhumanising cannot be expressed with words / but let the (previous) example be enough / to those who will experience it by the grace (of God)*[21].

Two centuries after Dante, Pico della Mirandola[22] is considered to be a proto-humanist landmark of the Renaissance (MORE: 2013: pg. 9). In *Oration on the Dignity of Man*, Mirandola reinvents the myth of creation, writing as if the Gods addressed the humans. Notwithstanding the religious/mythological aspects found in the text, it proclaims one of the core transhumanistic ideals, which is that man does not have a ready-made form and is responsible for shaping himself. Mirandola writes:

> **We have given you, oh Adam, no visage proper to yourself, nor any endowment properly your own, in order that whatever place, whatever form, whatever gifts you may, with premeditation, select, these same you may have and possess through your own judgment and decision. The nature of all other creatures is**

[19] Among all claims, the most recurrent ones are: immortality and paranormality; an existence with no suffering (or with less suffering, at least); and the one that interests us in the current thesis: the rising of a “new Earth” (in the sense of optimising and conserving our own world as well as of creating new habitable worlds whether natural or artificial ones.

[20] Durante degli Alighieri (1265-1321), better know as Dante Alighieri, Italian poet.

[21] Dante’s original reads: *Trasumanar significa per verba non si poria / però l’essemplo basti a cui esperienza grazia serba*; Paradiso (1).

[22] Giovanni Piccolo della Mirandola (1463-1494), Italian philosopher.

> **defined and restricted within laws which We have laid down; you, by contrast, impeded by no such restrictions, may, by your own free will, to whose custody We have assigned you, trace for yourself the lineaments of your own nature. I have placed you at the very center of the world, so that from that vantage point you may with greater ease glance round about you on all that the world contains. We have made you a creature neither of heaven nor of earth, neither mortal nor immortal, in order that you may, as the free and proud shaper of your own being, fashion yourself in the form you may prefer. It will be in your power to descend to the lower, brutish forms of life; you will be able, though your own decision, to rise again to the superior orders whose life is divine (MIRANDOLA: 1956: p. 7-8).**

There are other proto-humanist noteworthy names such as Giordano Bruno[23], who intended to create some sort of meditation technique that was supposed to expand intelligence and memory. Also, Tommaso Campanella[24] who advocated in favour of a somewhat mystical eugenics in his work *The City of The Sun*, where he established that marriages determined by favourable astrological prognostications would lead to the development of brighter and stronger human beings. Throughout the centuries, alchemists laboured to concoct the elixir of long life and sought other conceivable means to miraculously extend human capabilities.

It is quite clear that what was then sought after by magical means was later made possible by technological ones. Marquis de Condorcet[25] is not to be forgotten here, as he was a critical cornerstone of this departure from magical thinking. He was one of the first illuminist thinkers to suggest an improvement in human nature and circumstances boosted by scientific knowledge with the potential to bring prosperity to the world. According to Condorcet:

> **In fine, may it not be expected that the human race will be meliorated by new discoveries in the sciences and the arts, as an unavoidable consequence, in the means of individual and general prosperity; by farther progress in the principles of conduct, and in moral practice; and lastly, by the real improvement of our faculties, moral, intellectual and physical, which may be the result either of the improvement of the instruments which increase the power and direct the exercise of those faculties, or of the improvement of our natural organization itself. (…) Would it even be absurd to suppose this quality of melioration in the human species as susceptible of an indefinite advancement; to suppose that a period must one day arrive when death will be nothing more than the effect either of extraordinary accidents, or of the flow and gradual decay of the vital powers; and the duration of the middle space, of the interval between the birth**

[23] Filippo Bruno (1548-1600), better known as Giordano Bruno, Italian philosopher, and Christian monk.
[24] Giovanni Domenico Campanella, (1568-1639), better known as Tommaso Campanella, was an Italian philosopher, Dominican friar, and astrologer.
[25] Marie Jean Antoine Nicolas de Caritat (1743-1794), also known as Nicolas de Condorcet, French philosopher and mathematician.

> **of man and his decay, will itself have no assignable limit? (CONDORCET *apud* MORE: 2013: pg. 9-10).**

Since then, the word “transhumanism” has assumed several meanings, whose common point regards to the possibility of becoming more than human. Conversely, differences among ancient and contemporary meanings are huge. Dante’s *trasumanar*, for example, is a gift given by God. A grace not only spiritual but also corporeal, which is parallel with the Christian concept of resurrection: never a disembodied afterlife, given that the earthly Paradise is built in a post-apocalyptic world divinely created. Under this belief, the transformation of the mortal flesh into a glorious body is a promise, and promises do not depend on us. The Christian and Dantesque *trasumanar* is above all *hope.* The hope of being blessed and resurrected by God in new transhumanised bodies, in which our souls will be free from weakness or suffering in any instance.

Another noteworthy difference between the Christian *trasumanar* and the contemporary transhumanism regards the distinction between *quality* and *quantity*. Contemporary transhumanism is dedicated to achieving *more*: more time, more life, more power, more pleasure, more places to go. The Christian *trasumanar*, in turn, by believing in a post-apocalyptic eternal life as reward, is not concerned with the extension of a bodily life, but with the quality of its even short existence. This concern for quality demands to dedicate life to the virtues that will guarantee a place in the Kingdom of God. It should be noted that in neither case is the Earthly Paradise incorporeal: from the Christian perspective, there is work to be done in the Divine Kingdom. From Christian *trasumanar* to contemporary transhumanism, the crucial difference is between *having hope* (in order to obtain a grace, a divine reward for our qualities/virtues) and *acting* (in order to guarantee more time and self-enhancement). If in Dante the *trasumanar* is a Godlike gift (*grazia*), the current transhumanistic movement is not interested in waiting for a possibility grounded in faith and hope. Instead of waiting for an eventual future Paradise, contemporary transhumanists want to make it real here and now.

The transhumanism proposed here is contrary to any guarantees provided by the Christian *trasumanar.* The Christian *trasumanar* is an apocalyptic guarantee, it is heaven established after the dead are resurrected in new glorious bodies. It is a promise rising in the horizon pending on the three theological virtues/qualities: hope (of one day reaching heaven), faith (in the existence of heaven itself) and charity (as

a condition to enter heaven).

Conversely, contemporary transhumanism is not a guarantee, it is a goal founded in *desperation*[26]. There is no heaven guaranteed for this universe, although this heaven could be highly likely to exist in *some* universe, considering the cosmic adventure unfolds in multiple realities. Hence, it is imperative that we fight so that our universe is one of the successful scenarios since this is a universe prone to the emergence of life and which finds in the emergence of consciousness its greatest realisation. We should follow an ethic imperative: to see this planet not as our *destiny*, but as a *starting point*, given that the natural mortality of this world is a concrete fact[27]. Raising the odds for life and consciousness is mandatory, and should be considered as our moral obligation as intelligent beings we indeed are. At this point, it is worth to note that some theses and articles on transhumanism tend to turn to the *summum bonum* as a main theme. A good example is available in David Pearce[28]'s manifesto against all suffering:

> **This manifesto outlines a strategy to eradicate suffering in all sentient life. The abolitionist project is ambitious, implausible, but technically feasible. It is defended here on ethical utilitarian grounds. Genetic engineering and nanotechnology allow *Homo sapiens* to discard the legacy-wetware of our evolutionary past. Our post-human successors will rewrite the vertebrate genome, redesign the global ecosystem, and abolish suffering throughout the living world. (…) Our descendants may live in a civilisation of serenely well-motivated "high-achievers", animated by gradients of bliss. Their productivity may far eclipse our own[29].**

Although the transhumanistic approach sometimes may be utopian in several ways, the current thesis is focused on harm reduction policies. Many propositions have been put forward by transhumanists, but the idea that *techne* be intentionally employed to actively promote enhancement is one that is shared by all of them. This human intent that architects, plans, designs and produces results through technology is endorsed by transhumanists as part of the set of desirable items, provided that said directed intention is guided by an ethical criteria within a non-anthropocentric

[26] In the sense of: "the feeling of being in such a bad situation that you will take any risk to change it".
[27] One could argue that the mortality of the universe is also a concrete fact. There is nothing to say, however, that other universes cannot be created from information provisioned by the consciousness that emerged here (*baby universes*, as imagined by Gardner, whose hypothesis we are going to analyse in the next chapter), constituting an *endless game*, a *never ending story* this way.
[28] A British philosopher, and co-founder of the World Transhumanist Association.
[29] PEARCE, D. *The Hedonistic Imperative.* Available at: https://www.hedweb.com/hedab.htm. Accessed on March 14, 2019.

framework. The transhumanist *ethos* defends the maximum reduction of any involuntary suffering of sentient beings based on damage control. Although the many existing organised groups who self identify as transhumanists[30] subscribe to different strands of political positions, the alleviation of the suffering of all sentient beings is a commonality among them.

The term "transhumanism" as referring to the view that humans should better themselves through science and technology was first devised by Julian Huxley[31]. In 1957, Huxley publishes his article *Transhumanism*, with the premise that the human superior intellect did not grant us special rights but rather that it imposes us duties and demands that we be more responsible toward other beings and the universe as a whole. Huxley's text is especially meaningful as it presents our enhancement not as a complimentary of a frivolous, vain, arrogant or self-absorbed motivation, but as the foundation on top of which a human *responsibility* that cannot be ignored is built:

> **As a result of a thousand million years of evolution, the universe is becoming conscious of itself, able to understand something of its past history and its possible future. This cosmic self-awareness is being realised in one tiny fragment of the universe — in a few of us human beings. Perhaps it has been realised elsewhere too, through the evolution of conscious living creatures on the planets of other stars. But on this our planet, it has never happened before (HUXLEY: 1957: p. 13-17).**

It is interesting to note Huxley's considerations in regard to alien intelligence. That is the utmost tenet of transhumanism: in contrast with other outlooks, it does not ascribe inherent worth to humankind but to a *cosmic self-awareness*. The same type of awareness might have already come into shape at some other corner of the universe and might even be artificially created in our own world. That said, it is possible to postulate that transhumanism as conceived by Huxley, and defended here is not anthropocentric. Humankind's inherent worth does not rest upon its form, but in its *intellect and awareness*. Therefore, said worth could take any other shape, including one of our own design.

When the claims driving the debate assert that a given being has value in their own right, chances are the focus is on how entitled said being is to have rights and

[30] See for example the "Humanity Plus", who constitutes an organised transhumanist group. Official website: http://hplusmagazine.com (accessed December 1, 2018). There are also organised political movements such as the "Transhumanist Party" who in 2016 nominated Zoltan Istvan - a self-proclaimed "libertarian" - to the presidency of the USA. Official website: http://transhumanist-party.org (accessed December 1, 2018).

[31] Julian Sorell Huxley (1887-1975), a British biologist, first director of United Nations Educational, Scientific and Cultural Organisation (UNESCO).

why it is special in contrast with all the other ones whose value is merely instrumental. To Huxley, however, what matters is not a being's right to something but its *responsibility*, *id est*, the duty that follows *the gift of intelligence*. But what is the nature of this responsibility?

In an attempt to answer this question, one should not ignore the fact that much is said about humankind's destructive potential, about our impact on the planet, that our actions lead to the extinction of whole species and how we have been drastically changing the climate. All this is true. Nevertheless, it is also true that extinction is nature's default rule. The very same nature that was time and again referred to as possessing the intelligence of a watchmaker would be more accurately described as a *blind* watchmaker. Any sense of stability and safety are but an illusion that our brief existence in this world allows us to entertain.

While human destructive power is to be feared, mass extinction events have already taken place long before we came into being and will happen again at some point in the future. Be as damning as human impact on the planet may be, it still is not capable of making life utterly unsustainable. The same cannot be said about extreme cosmic events. It is a matter of time until the sun extinguishes, putting an end to all life on the planet. All shortcomings aside, the human species is the only one capable of protecting life – beyond that of its own species - against the fatal cosmic extinction. As pointed by Huxley:

> **The new understanding of the universe has come about through the new knowledge amassed in the last hundred years — by psychologists, biologists, and other scientists, by archaeologists, anthropologists, and historians. It has defined man's responsibility and destiny — to be an agent for the rest of the world in the job of realising its inherent potentialities as fully as possible. (…) That is his inescapable destiny, and the sooner he realises it and starts believing in it, the better for all concerned (HUXLEY: 1957: p. 13-17).**

That is the centre of Huxley's transhumanism, which this thesis agrees with: *intelligent beings who have a destiny and a responsibility to nature and the universe*. Some features of non-accidentality are made clear when Huxley holds that this responsibility constitutes an "inescapable destiny". Defining something as "inescapable" entails non-contingency, which seems quite out of place for a biologist, given the fact that the existence of humankind is nothing but a mere contingency like any other in the light of natural selection. A contingency susceptible to destruction as

a result of an asteroid collision, any other random cosmic phenomenon or even as a result of its own technological advances run amok.

It is relevant to highlight that although Huxley opens his article by pointing out that self-awareness is being realised in us human beings, he does not rule out the possibility of it being realised elsewhere as well. Once Huxley establishes consciousness is a product of an evolving universe, it stands to reason that this consciousness has already been realised, is being realised and will be realised at other places and at other times given how vast the universe is. Our universe would thus be biophilic and the second chapter of this thesis demonstrates that there is enough evidence to support this view satisfactorily.

If consciousness is the result of an evolutionary process of the universe and if the universe is so vast, in the event of humankind not taking the lead of its *inescapable destiny* of *responsibility*, one day some other intelligent/self-aware species will. Nevertheless, it is possible to argue that Huxley's view is optimistic since the realisation of consciousness could well be unique to Earth, considering that which we call the "universe" is still a finite and limited set – no matter its size. The unlikelihood of this statement does not make it utterly impossible. Why is it then that Huxley bets on an “inescapable destiny” for intelligence?

As far as beliefs go, one might contend that perhaps there is a cosmic *telos* to favour the emergence of life. The realisation of intelligence, and self-awareness has however worse odds. After all, even if we work with the concept of infinity, not even the spatial nor the temporal endlessness of multiple universes may guarantee intelligence to come about.

Three philosophical questions arise from this Huxley’s excerpt. The first question is: *does the author advocates a cosmic Darwinism?* It would seem so in light of the link he establishes between the realisation of consciousness on planet Earth and an evolutionary process of thousands of years to subsequently state that the very same process could have happened elsewhere; The second one is: *does Huxley defend the existence of a cosmic plan*? The answer to this is: likely so, though hardly in a theist sense. The intelligence/self-awareness that is noticeable in us would act as an agent to make the *intrinsic potentialities* come to their own; that applies not only to humankind but *to the rest of the world*; This begets the third question: *which potentialities are these?*

Alas, Huxley does not provide an answer in his article to nature's intrinsic potentialities to which he alludes. He propounds we have a responsibility to the universe, but does not describe what constitutes said responsibility. Huxley's scope is limited to outlining our potential for self-enhancement by means of science and technology, our ability to overcome unnecessary misery:

> **Up till now, human life has generally been, as Hobbes described it, *nasty, brutish and short*; the great majority of human beings (if they have not already died young) have been afflicted with misery in one form or another—poverty, disease, ill-health, over-work, cruelty, or oppression. They have attempted to lighten their misery by means of their hopes and their ideals. (…) We are already justified in the conviction that human life as we know it in history is a wretched makeshift, rooted in ignorance; and that it could be transcended by a state of existence based on the illumination of knowledge and comprehension, just as our modern control of physical nature based on science transcends the tentative fumbling of our ancestors, that were rooted in superstition and professional secrecy (HUXLEY: 1957: p. 13-17).**

Huxley introduces a powerful point that appears to have gotten off track along the text. Clearly, the responsibility of which he speaks is one that the human species has over *the rest of the world*. The focus prematurely shifts, however, to a description of our capacity to overcome limitations. Notwithstanding, the transhumanists that ensued made clear that such responsibility and destiny is twofold: (1) there is a need to preserve life and consciousness - though not necessarily the anthropomorphic one through which consciousness is realised; (2) and the need to ensure the proliferation of life and of consciousness throughout the cosmos.

Huxley concludes his article by emphasising yet another important element of this *responsibility and destiny*: that it is not restricted to an individual process. That it is, instead, a collective one involving the whole species, which translates into a *new form of existence*.

> **The human species can, if it wishes, transcend itself — not just sporadically, an individual here in one way, an individual there in another way, but in its entirety, as humanity. We need a name for this new belief. Perhaps transhumanism will serve: man remaining man, but transcending himself, by realising new possibilities of and for his human nature. *I believe in transhumanism*: once there are enough people who can truly say that, the human species will be on the threshold of a new kind of existence, as different from ours as ours is from that of Peking man. It will at last be consciously fulfilling its real destiny (HUXLEY: 1957: p. 13-17).**

The ancient myths abound with tales of human transmutation into other species, not to mention people with magical powers. According to contemporary

transhumanists, that which we dreamed of in the form of fiction can now be realised by means of technological advancements. Those fantasies of ours from the past gradually take shape in present reality and in a likely future one, which calls for a new ethics.

This new ethics, as seen here, emerges from the stress between Dante and Huxley's concept of transhumanism: on Dante's perspective, a new Earth and a new body given by God (hope); on Huxley's view, there is nothing guaranteed, but a goal we should fight for instead of waiting for.

1.3. Prometheus unbound.

Even human beings who are contrary to transhumanism are *transanimals*, for their history is one of a constant plight against their biological limitations. Though some animal species are intellectually advanced to the point that they are able to make use of tools, the human species is the only one capable of not only transcending the biological limitations imposed upon them but also of altering many future possible outcomes by means of ever more sophisticated technological enhancements. The Darwinian mechanism for natural selection where those best suited to the environment survive is reshaped by human intelligence now that it is the environment that changes to adapt after our influence. We now detain the power to bring about river diversions, deforestation or reforestation. In a very likely future, such human modifications to entire worlds could be made possible by planetary engineering processes known as "terraforming". Technology - which encompasses genetic engineering - has advanced to the point whereby we can redesign ourselves as well as future generations.

This is paramount to the transhumanist thinking: the idea that not only is it feasible but also *desirable* that humankind draws upon *techne* to reshape itself and the surrounding environment to the extent that limitations and suffering of biological roots are mitigated or ultimately overcome altogether. Those evolutionary mechanisms driven by blind nature bear *intentionality* when driven by us. The claims asserting the *desirability* of this enterprise must, however, undergo philosophical scrutiny once an action grounded merely on its feasibility does not entail ethics in its foundation. The fact that something is *possible* is not akin to it being *advisable*.

Such inquiry over the foundations of ethics is imperative considering that, at the present, the bulk of human activities is not limited to temporal-spatial confines as it once was. As pointed by Jonas, if our ancestors' misguided deeds put people in danger and posed a threat to a general quality of life that could linger for some time into the future, the contemporary human power of influence has a much farther reach. Our actions may affect the whole extent of the Earth as well as deprive our descendants of any future (JONAS: 2015: p. 31-34). The contentions regarding the prescriptive role of psychology no longer apply before this scenario. New ethical systems must be set forth. To that intent, the use of imagination as a tool is pivotal, since resigning to the contemplation of that which is and that which once was will not suffice anymore. A philosophy dedicated to probable futures is critical in light of the implications of the power we currently detain.

It is worth to remember that in the early nineteenth century Hegel[32] said, regarding our desire to establish how the world ought to be, that (...) *philosophy, at any rate, always comes too late to perform this function* (...) *the owl of Minerva begins its flight only with the onset of the dusk* (HEGEL: 1991: p. 23). This Hegelian allegory could however be reread by noting that the moment the owl of Minerva begins its flight, it has a brief overview of the world *before* a new dawn. Hence one of the reasons why this thesis is concerned with the philosopher Hans Jonas for the greater part: throughout his life work – notably in *Das Prinzip Verantwortung* - Jonas pleads for the outlining of a philosophy that contemplates the future. For instance, Jonas's words *Knowledge of the Possible is Heuristically Sufficient for the Doctrine of Principles* (JONAS: 2015: p. 73) are the philosopher's admission that the uncertainty of prognostications require extrapolations of an exponentially higher degree of complexity, but he goes on to say that

> **(…) this, however, does not preclude the projection of probable or arguably possible end effects. (…) Its means are thought experiences, which are not only hypothetical in the assumption of premises (...) but also conjectural in the inference from "if" to "then" (...) (JONAS: 2015: p. 73-74).**

Traditional ethics is proven insufficient to perform such conjectural endeavour. Fiction then comes into play, pointed out by Jonas as:

[32] Georg Wilhelm Friedrich Hegel (1770-1831), German philosopher.

> **(...) a casuistry of the imagination which, unlike the customary casuistries of law and morality that serve the trying out of principles already known, assists in the tracking and discovering of principles still unknown. The serious side of science fiction lies precisely in its performing such well-informed thought experiments, whose vivid imaginary results may assume the heuristic function proposed. (See, for e.g., A. Huxley's Brave New World.) (JONAS: 2015: p. 74).**

Other thinkers are in alignment with Jonas when they characterise the significance of science fiction to society. Clarke, for one, defends that:

> **Fiction is more than non-fiction in some ways (…). You can stretch people's minds, alerting them to the possibilities of the future, which is very important in an age where things are changing rapidly**[33].

Foucault viewed fiction as not being reduced to an instrumental conjectural role, one for foresight and admonition, but also as an inchoative tool to produce the future:

> **It seems to me that the possibility exists for fiction to function in truth, for a fictional discourse to induce effects of truth, and for bringing it about that a true discourse engenders or "manufactures" something that does not as yet exist, that is, "fictions" it. One "fictions" history on the basis of a political reality that make it true, one "fictions" a politics not yet in existence on the basis of a historical truth (FOUCAULT: 1994: p. 236).**

Thus, there are at least two distinct senses to the act of *fictioning* – embracing here the Foucaultian neologism. One is ascribed by Foucault himself, which is that of imagining something in order to bring such thing into existence, a productive engagement with the aim of realisation, which is the intent of the transhumanist movement. The second sense of *fictioning* is that of prescribing a desirable future. Prescribing a city of the future is a simpler task than the other sense of *fictioning*: to use fiction as a toolkit for anticipation in order to lay grounds for an ethic, as put forward by Clarke. After all, envisioning the future involves the assessment of an immeasurable number of different degrees of likelihood inherent to a barrage of possible outcomes that are hard to grasp due to our cognitive limitations. Prescribing a desirable future, on the other hand, is more reasonable. It is what the current thesis intends to do, given that it is, as Huxley sustains, our responsibility as intelligent species.

[33] Clarke, Arthur C. Interviewed by *The AV Club* (2004, February 18). Retrieved from: https://www.avclub.com/arthur-c-clarke-1798208319. October 12 2018.

In light of all this, the present thesis is in consonance with Jonas in his quest for the elaboration of a new ethic that meets the demands of the current human condition, in view that in the past:

> **(...) *techne* in the form of modern technology has turned into an infinite forward-thrust of the race, its most significant enterprise, in whose permanent, self-transcending advance to ever greater things the vocation of man tends to be seen, and whose success of maximal control over things and himself appears as the consummation of his destiny (...) Ethical significance belonged to the direct dealing of man with man, including the dealing with himself: all traditional ethics is *anthropocentric* (...) The good and evil about which action had to care lay close to the act, either in the praxis itself or in its immediate reach, and were not a matter for remote planning. This proximity of ends pertained to time as well as space. The effective range of action was small, the time-span of foresight, goal-setting and accountability was short, control of circumstances limited (...). The long run of consequences beyond was left to chance, fate or providence (JONAS: 2015: p. 35).**

The Kantian ethics comprising human-human relationships is not rendered obsolete by the emergence of this new ethic but has its scope expanded instead. Both Jonas and transhumanists alike converge in the argument for a model that stretches beyond anthropocentric views in order to escape the greatest of all evils: the extinction of human species. Although this argument seems anthropocentric, it is not. Humankind is seen as the only species who is *responsible* for the other living beings, not as *more valuable* than them. We shall see later the main points that sustain such argument. Shared common grounds notwithstanding, there are points of rupture between Jonas and transhumanists that require closer examination.

Just as in the myth of Prometheus, fire is the element that endows us with the power of the gods. Since its discovery, we have been ceaselessly changing nature - our own and that which surrounds us - like no other sentient being on this planet has. Our *transanimal* condition entices us to “fiction” worlds in order to create them. One may ponder that the gods represented in our myths are much more than an expression of our superstitious understanding of nature. Perhaps such gods are a product of transposed nostalgia: a longing for the future. The fictional drive, so far manifested only in humans, allows us to build narratives that illustrate not only fears but aspirations as well. Technological advances progressively turn real what once was fiction and transfigures us into the mythical entities we dreaded and revered erstwhile as we become beings able to fly, to master electricity and magnetism and even to unveil secrets of life and death.

We would be easily taken for gods or wizards if our existence were to be witnessed by a 19th century villager since current technology can only be discerned from yesterday's magic due to the degree of acquired knowledge. As formulated by Clarke in his third law: *Any sufficiently advanced technology is indistinguishable from magic*[34]. It just so happens that knowledge and power of such scale may create just like it may destroy, so that it would be naive to praise our state-of-the-art *techne* as being inherently good. The urgency of a new ethical system that accounts for the future is justified precisely by the enormity of the technological power and knowledge acquired by humankind, as argued by Jonas:

> **Prometheus definitively unbound, invested with unprecedented strength by science, which also pushes the economy into uncontrolled expansion, requires a system of ethics involving freely accepted restraints to prevent the power of human beings from becoming a curse to them. No previous ethics thus provides guidance as for to which norms of "good" or "evil" the entirely novel forms of power and its possible creations should subscribe. (…) is that the golden promises of modern technology have turned into a threat, and that technology is inseparably linked with the threat. (…) The new territory humankind has conquered with high technology is still a no-man's land for ethical theory (JONAS: 2015: p. 21).**

All things considered, the current thesis holds Jonas's premises are perfectly correct (the pressing need for a new non-anthropocentric ethic, the advance of the heuristic of fear), but his conclusions regarding action are in contradiction with these very same premises. From a transhumanist perspective, one must go beyond anthropocentrism, which is what Jonas also proposes. But, further than that, one must also go beyond his *biogeocentrism*.

In order to do that, it is necessary to take into serious consideration the main critics against contemporary transhumanism. On the basis thereof, the main actors calling for the ethical discussion are presented here: on the one side there is the transhumanist movement and its apology for the application of *techne* to improve and overcome the human condition. Conversely, there are contemporary philosophers who speak from a conservative standpoint, such as Fukuyama[35], Sandel[36], and Jonas himself, whose objections and warnings must be seriously taken into account.

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[34] Clarke describes his third law é in the 1973 edition of *Profiles of the Future: An Inquiry into the Limits of the Possible*. Different versions of this same law made earlier appearance, most frequently within literary works of fiction, such as in *The Hound of Death* by Agatha Christie (1933), where it reads: *The supernatural is only the natural of which the laws are not yet understood*.
[35] American philosopher, and economist. Birth: Chicago, EUA, 1952.
[36] American philosopher. Birth: Minneapolis, EUA, 1953.

1.4. Objections to transhumanism.

1.4.1. First objection: the "Ship of Theseus Paradox".

One of the most recurrent of the existing criticisms against transhumanism is the assumption of a supposed dualism between mind and matter preconized by transhumanists. This misconception is the result of the use of the verb *to upload* to describe the hypothetical process of transferring a human mind to an augmented artificial construct of indefinite longevity, something like a synthetic and enhanced version of our bodies. Nevertheless, with few exceptions, transhumanists tend to be materialists and concede that conscience requires a physical vessel and therefore discard the approach that contemplates the existence of incorporeal consciousness. As elucidated by More[37]:

> **A functionalist holds that a particular mental state or cognitive system is independent of any specific physical instantiation, but must always be physically instantiated at any time in some physical form. Functionalism is a form of physicalism that differs from both identity theory (a mental state is identical to a specific brain state) and behaviourism (mental terms can be reduced to behavioural descriptions). According to functionalism, mental states such as beliefs and desires consist of their causal role. That is, mental states are causal relations to other mental states, sensory inputs, and behavioural outputs. Because mental states are constituted by their functional role, they can be realized on multiple levels and manifested in many systems, including non-biological systems, so long as the system performs the appropriate functions (MORE: 2013: p. 7).**

The ship of Theseus paradox, as posited by Plutarch[38] in *Parallel Lives*, gave rise to a great variety of considerations and answers provided by philosophers and serves as a great tool to demonstrate transhumanist functionalism. Plainly speaking, the paradox goes something like this (PLUTARCH: 2008: pg. 20): Theseus sets sail in his ship Argos to a long voyage. As time goes by, the decayed parts of Argos are gradually replaced by new ones of the same material until that, eventually, every plank was replaced. The question thus posited is: would it still have been the same ship? Does Argos remain the same Argos? If we are to think in Aristotelian terms and take into account the four causes (formal, material, final and efficient), the mere

[37] Max More, born in 1964, British philosopher and futurist.
[38] Lucius Mestrius Plutarchus (46-120), Greek philosopher.

change in its material cause is not enough to make it a new ship. After all, the replacement of the composing parts of Argos was performed with other parts of the same nature: wood being replaced by wood.

However, if a wood part were to be replaced by a metal one, the ship would now be composed of an entirely different material whereby not only the material cause would have been modified, the efficient cause that makes the existence of the ship possible would also have been altered. Following Leibniz[39], one would conclude this not to be the same Argos, as he claims “A” is identical with “B” if and only if “A” and “B” have all of the same properties, then everything that is true for “A” must thus be true for “B”. It is interesting to observe that a metallic Argos should be more resistant than its previous wood version. It is even conceivable that engineers reassemble the ship in such a way that its formal cause is modified, presuming the new design makes it more efficient. At the end of the process, the only common cause between the original Argos and the one found decades later is its final cause, for the object remains a ship and retains its finality, which is that of transporting people through the ocean. We could even envision a situation wherein the engineers do not limit their modifications to the nature of the parts of the ship but also its existential end, converting the vessel into a means of transportation to be used not only at sea but also on land and air. Having its final cause modified, its name would be the single remaining aspect still shared between the old and the new Argos.

The allegory of the ship of Theseus may be used as a proxy for the human identity. It is known that, within the span of years, a body has its components replaced by others of equivalent nature. The fundamental difference between a ship and a human lies on the fact that the replacement process of human parts is *autopoietic* and does not require – not necessarily – any interference of external agents. The growth process of the body and the modifications it undergoes, such as hair growth or hair loss, increase or decrease of muscle tissue and the like are not tantamount to change of shape, as it remains anthropic and both its origin and the end of its replaced parts persist. A fifty-year-old man shares almost no cells with his twenty-year-old self, but he is understood to be “the same man”. A muscle cell is

[39] Gottfried Wilhelm Leibniz (1646-1716), German philosopher.

replaced by another muscle cell and so on and so forth so that the efficient cause remains identical[40].

Regardless of the autopoietic nature of the replenishing process of the human body (and that of any other biological body), *techne* allows us to exert direct influence and promote the replacement of parts with other parts whose efficient cause is diverse. It is the *homo faber* that redesigns itself through its transbiological action. Artificial parts perform the same functions as the replaced biological ones, *id est*, their final cause is identical.

Does this biotechnology that is capable of mitigating or eliminating suffering ultimately alter our human nature? We are not likely to find any legal or philosophical considerations offering grounds to deny the status of humanity to an individual who has prosthetic organs or limbs. But what if *every* body part were to be replaced by more resistant and long-lasting synthetic equivalent ones? What if said replacement granted super-human advantages? At which point, if there is any, does one cease being human and become something else?

Although transhumanism is not dualistic, but rather, as previously explained, functionalist, this functionalism posits us before another question that is of particular relevance to the medical praxis: is it ethical to allow for the voluntary removal of healthy biological parts in order to accommodate their more efficient synthetic counterparts in the absence of any ailment that demands treatment? The transhumanist movement promotes the right to such replacements, as can be seen in point 7 on the *Transhumanist Declaration:*

> **We favour morphological freedom – the right to modify and enhance one's body, cognition, and emotions. This freedom includes the right to use techniques and technologies to extend life, preserve the self though cryonics, uploading, and other means, and to choose further modifications and enhancements (VITA-MORE et al: 2013: p. 55).**

It is important to note that if the technological replacements do not entail function modification, they may characterise *transbiologism*, *transanimalism*, but not transhumanism. An artificial lens is built so as to replicate the exact same functions of a biological lens. A prosthetic arm developed with currently available technology is

[40] Note that when the efficient cause of a cell changes we have cancer, and if this condition is not corrected, the organism will meet its end.

capable of performing many - but not all - of the functions performed by an organic arm. A synthetic heart is intended as a replacement only to its faulty counterpart.

For the sake of argument, let us contemplate a scenario where every piece of the human biological machinery is gradually replaced, including its neurons until there is nothing organic left in the individual in question. It is the memory that sustains identity in this case: a hypothetical human artificially rebuilt from the ground up would be identified as being the same as its former biological human form. Even if he/she found him/herself having different thoughts and preferences, one could argue that he/she persists as the same human being due to a biographical line. Nonetheless, this holistic replacement that enables indefinite replenishment of parts would likewise enable indefinite mortality. Artificial limbs and organs are infused with increasingly sophisticated new technology, making them more powerful. Would it be appropriate to exclude an arguably immortal individual from the group of those we deem human? This is a whole new problem of dramatic social ramifications. Among the results emerging from these new biotechnologies is the decline of the mortality rate and the extension of lifespan that could have an economic impact on social security and the ecological implications of an ever increasing, enduring and interfering human population, to name a few of the consequences. Even bigger issues will follow, as we take longer to die or even stop dying altogether. That leads us to the second objection raised against transhumanism: the inherent risks posed by the rise of a new and more powerful species.

1.4.2. Second objection: the rise of the super-humans.

Fukuyama nominates transhumanism “the world’s most dangerous idea”: the rise of a class capable of enhancing themselves to super-human levels by means of private economic resources. According to him:

> **The first victim of transhumanism might be equality. (...) Underlying this idea of the equality of rights is the belief that we all possess a human essence that dwarfs manifest differences in skin color, beauty, and even intelligence. This essence and the view that individuals thus have inherent value is at the heart of political liberalism. But modifying that essence is the core of the transhumanist project. If we start transforming ourselves into something superior, what rights will these enhanced creatures claim, and what rights will they possess when compared to those left behind? If some move ahead, can anyone afford not to follow? These questions are troubling enough within rich, developed societies. Add in the implications for citizens of the world's poorest countries -- for whom**

> **biotechnology's marvels likely will be out of reach -- and the threat to the idea of equality becomes even more menacing.[41]**

The fact that such concerns might seem to belong only to the realm of fiction[42] does not mean we should take them lightly. Given that our world is one of such acute disparities where some people have access to resources denied to others, would it not be possible for transhumanism to contribute to the exacerbation of inequalities by giving birth to technologically enhanced human beings?

Despite Fukuyama's pertinent concerns, it is relevant to note that technology tends to become more affordable as it advances. Frontier technologies, which are at first within the exclusive reach of a wealthy few, are made accessible to those of more limited means not so later on. Michio Kaku [43] alludes to this matter demonstrating that, historically, technologies evolve in four basic stages: at an initial stage, a product is so precious it remains unattainable even to the most wealthy ones; to that, follows the stage where it becomes accessible to those who have the means to afford it at its high costs; the third stage is marked by prices plummeting in such a way that the technology is amply diffused; in its fourth stage, technology is assimilated to quotidian life to the extent that it becomes a *fashion statement*, turning to mere decorative accessories. A good example is human-mastered electricity: initially inaccessible and restricted to laboratories it then went on to become a product available to those who could pay a steep price for it; next, it was made so cheap that just about anyone may currently enjoy it; in developed societies, electricity is so commonplace that this technology has moved on to its fourth economic stage where it is used as decoration (KAKU: 2011: p. 335-337). Examples of this trend abound and the same stages could be described in the history of medication, of medical procedures and its related technologies all without losing sight of the fact that just a pair of shoes or glasses were a luxury of the financially privileged not too long ago. With all this in mind, it is considerably reasonable to assume that transhumanist enhancements are likely to start off as exclusive to the rich but become more affordable over time. In effect, the first rich adopters pay more to have access to a technology that is still in its early stages and in need of much refinement.

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[41] FUKUYAMA, Francis. *Transhumanism: The World's Most Dangerous Idea*. Available at: http://www.au.dk/fukuyama/boger/essay/. Accessed in November 2nd, 2018.

[42] It is indeed frequently denounced in science fiction movies and books such as *GATTACA* (1997) where ordinary humans suffer genetic discrimination.

[43] Michio Kaku (born in 1947), American physicist.

They play the role of "guinea pigs" or "beta users" thus paving the way for the further development of the technology so that by the time it reaches the masses, it is actually safer.

However, these human enhancements becoming more broadly widespread do not preclude the risk of irresponsible use of these technologies. As further elaborates Fukuyama:

> **Nobody knows what technological possibilities will emerge for human self-modification. But we can already see the stirrings of Promethean desires in how we prescribe drugs to alter the behaviour and personalities of our children. The environmental movement has taught us humility and respect for the integrity of nonhuman nature. We need a similar humility concerning our human nature. If we do not develop it soon, we may unwittingly invite the transhumanists to deface humanity with their genetic bulldozers and psychotropic shopping malls.**[44]

Furthermore, another concern raised is precisely the possible environmental impact given the extended - potentially indefinite - longevity of the transhumanists on a planet where new babies come to the world every minute. Despite the relevance of these forewarnings, these are issues that could be solved with adequate public policies and regulations.

If to Fukuyama “the world’s most dangerous idea” is transhumanism, this thesis upholds the exact opposite: the most dangerous idea is staying human, restricted to Earth at the mercy of the whims of chance. The fact that there are contingent dangers inherent to technical progress or the need for regulations is not disputed here. However, in light of the fact that we exist within a universe where chance may be ruthless - as seen in global extinction events - our hope to survive as a species lies on the ethical application of technology and perforce on overcoming our terrestrial confinements. Although it is true that this same Promethean impulse may render our current world impracticable and destroy us, that is a contingent scenario. Natural extinction because our restriction to planet Earth, however, constitutes certainty. Humankind has been lucky for an amount of time that is extremely short cosmically speaking, and it is the burden of this thesis to remind that:

> **(...) that all the labours of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius are destined to extinction in the vast death of the solar system, and that the whole temple of Man's achievement**

[44] FUKUYAMA, Francis. *Transhumanism: The World’s Most Dangerous Idea*. Available at: http://www.au.dk/fukuyama/boger/essay/. Accessed in November 2nd, 2018.

> **must inevitably be buried beneath the debris of a universe in ruins – all these things, if not quite beyond dispute, are yet so nearly certain that no philosophy which rejects them can hope to stand (RUSSEL *apud* CLARKE: 1970: p. 256)**

In view of all the above, we now move on to the third objection made against transhumanism: the dangers in “playing God”.

1.4.3. Third objection: genetic engineering

Finally, one of the main reservations regarding transhumanism accuses the movement of seeking to achieve an alleged “perfection” of humankind making use of eugenics or genetic manipulation. Perfection as an end characterises utopian ideals, which is quite distinctive from that which transhumanism intends. According to Max More:

> **(…) Transhumanists seek not utopia, but perpetual progress – a never-ending movement toward the ever-distant goal of extropia. If the transhumanist project is successful, we may no longer suffer some of the miseries that have always plagued human existence. But that is no reason to expect life to be free of risks, dangers, conflicts, and struggle. Outside, perhaps, of David Pearce's goal of eliminating all suffering, you will have to search far and wide to find any suggestion of utopia or perfection in transhumanist writing. (…) Transhumanism is defined by its commitment to shaping fundamentally better futures as defined by values, goals, and general direction, not specific goals. Even to the extent that a goal is somewhat specific – say, abolishing aging, becoming post-biological, or enhancing cognitive abilities to some arbitrary degree – the means and time frame in which these might be achieved are open to differing views. Transhumanism per se says much about goals but nothing about specific means or schedules. (…) Transhumanists do seek to improve the human body, by making it resistant to aging, damage, and disease, and by enhancing its senses and sharpening the cognition of our biological brains. (…) In reality, transhumanism doesn't find the biological human body disgusting or frightening. It does find it to be a marvelous yet flawed piece of engineering. It could hardly be otherwise, given that it was designed by a blind watchmaker, as Richard Dawkins put it. True transhumanism *does* seek to enable each of us to alter and improve (…) the human body and champions morphological freedom. Rather than denying the body, transhumanists typically want to choose its form and be able to inhabit different bodies, including virtual bodies (MORE: 2013: p. 14-15).**

In view of this, it is not accurate to assert that transhumanism strives for *perfection* (a final state). It is *enhancement* - an endless process - that which transhumanism seeks. Should the hypothetical state of perfection be the goal of transhumanism, the movement's ideals would then be consistent with the eugenic motivations conceptualised by the Nazi and their ideal of “superior race”. Nazism,

however, hinges on negative eugenics, namely compulsory or encouraged sterilisation of people appearing to have deemed undesirable traits and the abortion of embryos and ferns bearing derelict genetic properties. Such practices were not reserved to the unborn only once Nazism, as it is putative knowledge, is also a proponent of genocide.

Transhumanists reject negative eugenics in all its forms but embrace the new positive eugenics, which has in the screening of desirable embryos *in vitru* a prominent practice. This screening, one must add, would not be - or should not be - based on sheer aesthetic criteria, but on the intent of freeing humans of genetic markers that are cause for grave suffering.

Take the case of the Huntington gene by way of illustration: an autosomal dominant disease highly prevalent among Europeans (one in every hundred thousand born is estimated to be afflicted[45]) to which there is no known cure. The offspring of a bearer of the Huntington gene has a 50% chance of inheriting the disorder[46], which normally manifests around one's forties and is characterised by progressive and irreversible loss of motor and cognitive functions, which is to say one's complete autonomy and results in a premature death after many years of slow and painful degeneration. It is not the sterilisation of those carrying the Huntington gene – either willing or unwilling - that is encouraged, but the positive eugenics instead: the *in vitru* selection of those embryos that do not carry the disease. The question "Is it ethical to screen embryos?" is contrasted with another question "Is it ethical to sentence an individual to an existence with an incurable disease that imposes such unbearable pain when this could be averted?".

Under extreme circumstances, positive eugenics is regarded as acceptable by the medical ethics, which does not entail that its practices should be adopted in other instances, however tempting they might seem. An *in vitru* fertilisation usually produces many embryos, but only one of them is implanted in the uterus while the remainder is discarded. Advances in modern technology allow us to detect which among those embryos present severe oncogenes or other less desirable predispositions, from simple myopia to genetic markers for depression. Medical ethics have no qualms about discarding syndromic embryos once they are identified

[45] According to European Huntington's Disease Network. Available at http://www.ehdn.org/ accessed on 2nd December, 2018.
[46] If both parents are carriers of the gene, the odds are increased to 75%.

but does not apply the same conduct to any genetic defect without distinction. Some traits, as undesired as they might be, have available preventive measures or treatments and their removal could result in the elimination of other highly desirable traits. In eliminating an organism on account of its cancer, myopia or Alzheimer genes, we would also be eliminating all the important uniqueness of this life in the process. We would be depriving the world of an individual whose existence would hold meaning to him/herself and to many others, regardless of an incidental suffering resulting from any given condition. To avoid any misconstruction, let it be clear this is not an appeal to the conception of an "elevated importance" of genius individuals, but a defence to *the right of every single human being to exist*. Is that however not the case when we test for more severe conditions in order to eliminate them as with the Huntington gene? What right do we have to bereave a person of at least four decades of existence, especially if we consider the possibility of the discovery of a cure at any point? The answers to these questions do not come easily and pose even a bigger challenge in light of the fact that many embryos will invariably be discarded in any case within the context of *in vitru* fertilisation. Why not select the best seed? However, in so doing, what would stop this from being permissible to anyone else, at risk of engendering a *GATTACA*[47]*- like society*? Although it may be tantalising to put positive eugenics into practice - and this is a position many transhumanists uphold - there is yet another process that does not deny anyone the right to exist: genetic editing.

The *Clustered Regularly Interspaced Short Palindromic Repeats* technology (CRISPR), under full development, allows for selected DNA segments to be targeted for deletion[48]. Biology is essentially information. Once the genes responsible for suffering are identified, it is possible to delete them much like a text editor removes grammar errors. In theory, it is even possible to add information, conferring once inexistent qualities to the organism. The possibilities offered by this technology are vast and include the suppression or reversion of not only diseases but of the aging process, the enhancement of strength and improvement of cognitive capacities. In

[47] North American science fiction movie (1997) depicting a world where it is mandatory that reproduction occurs exclusively by means of genetic selection and individuals born without undergoing this previous screening suffer discrimination. Written and directed by Andrew Niccol.

[48] In a matter of fact, in 2018 a Chinese scientist claimed to have created the first human beings HIV-immune, which poses serious bioethical questions. Information available at https://www.technologyreview.com/s/612458/exclusive-chinese-scientists-are-creating-crispr-babies/, link accessed on 2nd December, 2018.

other words: *enhancement*, the core drive to transhumanism. As CRISPR technology develops and goes through the four technological stages previously described and becomes sufficiently advanced and widely spread, new regulatory framework will be required.

The transhumanist aim of correcting nature's faults tends to find resistance in the conservative thought resting on the premise that such practices are unnatural, rejecting the *gift* and the *openness to the unbidden* (SANDEL: 2007: p. 59). At this point, it is interesting to observe the similarities between Sandel and Jonas: both see the unforeseen, chance, error, and chaos as a transcending factor. The transhumanist efforts to eliminate "error" from nature would thus be a negation of said transcendence. A crucial distinction sets the way these authors regard chance, though: Sandel views practical aspects, human values and life in society as the major problem. In his words:

> **(...) That we care deeply about our children and yet can't choose the kind we want teaches parents to be open to the unbidden.. (...) One of the blessings of seeing ourselves as creatures of nature, God, or fortune is that we are not wholly responsible for the way we are. The more we become masters of our genetic endowments, the greater the burden we bear for the talents we have and the way we perform (SANDEL: 2013: p. 98-99).**

Sandel goes on to demonstrate the intrinsic relation between the gifts of happenstance and human virtues:

> **Why, after all, do the successful owe anything to the least-advantaged members of society? One compelling answer to this question leans heavily on the notion of giftedness. The natural talents that enable the successful to flourish are not their own doing but, rather, their good fortune – a result of genetic lottery. If our genetic endowments are gifts, rather than achievements for which we can claim credit, it is a mistake and a conceit to assume that we are entitled to the full measure of the bounty they reap in a market economy. We, therefore, have an obligation to share this bounty with those who, through no fault of their own, lack comparable gifts. Here, then, is the connection between solidarity and giftedness: A lively sense of the contingency of our gifts — an awareness that none of us is wholly responsible for his or her success — saves a meritocratic society from sliding into the smug assumption that success is the crown of virtue, that the rich are rich because they are more deserving than the poor (SANDEL: 2013: p. 98-99).**

Although he is right when emphasising that none of us is solely responsible by our own success, Sandel makes a mistake by placing the fundamental source of solidarity on natural inequality. Genes are not destiny and there are no guarantees to determine that a genetically well-endowed person becomes successful in the future.

At best, it is only possible to ensure the preclusion of certain intrinsic ailments - but not of the extrinsic ones, those related to misfortune, accidents and other happenstances. Conferring an optimum organic structure for a person to act in the world is the most that can be achieved and nothing can be definitively done regarding this person's relationship with others and their existence. No matter how much the playing field of each individual's origin is levelled by genetic engineering, the environmental circumstances will remain random and under the rule of "luck". The contingency of life is not removed by the selection or edition of genes. It is the uneven organic starting point that is mitigated or completely eliminated. The existence of human solidarity is not dependent on the extreme suffering of others as there is plenty randomness of fate and accidents in the world to trigger in us the impulse to help those in need. An existence free from diseases or filled with super-humans who are mentally and physically powerful is not an existence free from suffering that does not require mutual support. As much as genetic engineering may improve social and individual conditions, it cannot eliminate chance from life.

Moreover, it is possible to use one of Sandel's arguments *in favour of* transhumanism. The idea that we have an obligation to share this bounty with those who, through no fault of their own, lack comparable gifts is precisely what may serve as justification to support the socialisation of advantageous genes. Genetic edition therapies would join the ranks of solidary acts, which is quite distant from selecting one's offspring, creating thus a divide between the "accidental" and the "chosen ones".

There is yet another way to contemplate chance: a metaphysical one. That is what Jonas offers us in asking:

> **How, then, does development come about? Why didn't the universe stop with the attainment of the elements, radiation, and the laws of causality? Why didn't it simply remain at this stage of most general order, with the macrocosmic and chemical formations that grew directly out of it? The answer to this question was given by Darwin There was always enough "disorder" left over to occasion the formation of new characteristics (structural factors) by accidental, random events, and the momentary successes were subject to the process of selection with its criterion of survival by sheer numbers. This is the required 'transcending factor' that leads to the new and then to the higher, and it does so without pre-information, without logos, without planning, even without striving, but only by means of the susceptibility of a given order, already coded for "information", to a surrounding disorder that forces itself upon it as additional information (JONAS: 2010: p. 17).**

In regarding “disorder” and “blind chance” as the transcending factors of the universe and supposing this to be true we face a problem: the human intent, the wish to impose order to chaos, to fix the disorganisation. In short, does the impulse to *direct* evolution constitute a metaphysical problem? Human intelligence is the exact opposite of disorganised and blind chance. With our intelligence, would we be deniers of transcendence? The ontological aspects underlying the nature of our universe and life itself must be addressed if we are to answer these questions. These are the grounds we are to walk in the chapter *Metaphysics*.

1.5. The *Starchild*[49] beyond anthropocentrism.

All things considered, we return to the transhumanist key ethical point in this thesis: *the biocosmic expansion as a moral imperative*. Faced with the question “why should this be done?” even the answer because we should survive" may sound insufficient, and generates another question: “what is the relevance of our survival? What makes us so important?” This thesis intends to demonstrate every sentient being is endowed with intrinsic value. Human intelligence does not endow us with more intrinsic value in comparison to other animals, but poses us moral obligations on one another, on the animals, and on the world.

The matter of a clear distinction between intrinsic value and instrumental value is one of the oldest contentions in bioethics history. Among all existing things in the universe, which of them hold value in their own right and which of them would solely hold value as a tool? This debate is not foreign to that between contingency and necessity. Instrumental value is always contingent as it depends on context. Inherent value, in turn, evokes the concept that an entity has value in itself, which poses a philosophical conundrum that is hard to solve: how can one speak of intrinsic value if any value depends on an observer capable of recognising it? To some thinkers, the notion of a “truncated intrinsic value” would be more suitable (CALLICOTT *apud* COCKELL: 2016: p. 169), whereas others prefer the concept of a truly inherent intrinsic value (ROLSTON *apud* COCKELL: 2016: p. 169). It is not the intent of this thesis to dispute whether there is a “metaphysical realism” in the concept of intrinsic value or whether this concept is nothing more than a nominalist convention. The

[49] The Starchild, in Clarke’s opera, is a kind of newborn cosmic entity.

matter at hand here is: *once the existence of intrinsic value is recognised, which beings are intrinsically valuable and why?*

From an anthropocentric viewpoint, humans are the sole bearers of intrinsic value, whilst all other elements in the universe are but mere instruments. It is worth saying that it may be tempting to define anthropocentrism as environmentally destructive since everything that is not a human being is taken as merely instrumental. There is some reason in this criticism against anthropocentrism if we take into account how predatory our behaviour on this planet is. Ignorance, however, is rather a contingent element of anthropocentrism, not its essence at all. Even if nature is seen as a mere instrument, this instrument can be well taken care of. There is the possibility of an environmentally correct anthropocentrism characterised for an enlightened self-interest by establishing a non-predatory relationship with the ecosystem. Given that humankind depends on a huge set of instrumentally valuable beings (plants, animals, inanimate objects), it is perfectly possible to conceive anthropocentrism as a non-egoistic approach, which takes future generations into account.

That is to say that it is not anthropocentrism as such that is to blame for environmental issues but one of its problematic forms: in particular, those that are egoistic or otherwise narrowly focused on satisfying individual needs and short-term interests irrespective of future generations. A truly anthropocentric ethic would account not only for existing individuals but for the whole of the human species – present and future. In light of all this, a question arises: *why must anthropocentrism be surpassed, even in its best form?*

In order to provide an answer, we must revisit Jonas. Committed to the elaboration of a most needed new ethical imperative that would enable us to prevent what he himself defines as being the *summum malum*, Jonas is guided by Kant. In contrast with the private quality of the imperative devised by Kant, which addressed primarily the private individual, the Jonasian injunction addresses public policies. Nonetheless, it must be noted that the new Jonasian imperatives remain in keeping with a subtle anthropocentric perspective. This is summarised by the author in the following:

> **A suitable imperative to serve as a new guide for human action and for the new form of acting individual should roughly go along the following lines: "Act in such a way that the effects of your action are compatible with the permanence of truly human life on Earth; or, expressed in negative terms: "act so that the**

> **effects of your actions are not destructive for the future possibility of such life"; or simply: "Do not compromise the conditions for an indefinite continuation of humanity on Earth"; or, again turned positive: "In your present choices, include the future wholeness of Man among the object of your will" (JONAS: 2015: p. 47-48).**

Upon reflecting on any of the proposed variants, one would come to the same conclusion: it is of foremost urgency to ensure the future of humankind by caring for nature. If the ultimate goal is, as the philosopher puts it, to secure *a truly human life* and *wholeness of Man,* that means human life possesses intrinsic value. In regarding humans as the ultimate goal of the ethical action, Jonas fails to fully reject anthropocentrism. Though moving away from a short-term oriented and egocentric anthropocentrism, which focuses on satisfaction rather than the collective future wellbeing of all humankind, his stance remains anthropocentric even that Jonas does not realise it.

This new imperative accounts for the pressing environmental needs but still proves insufficient to avoid the Jonasian *summum malum*, once it establishes human life as being restricted to this world. The human type and the Earth are, indeed, inexorably interconnected. The self-awareness realised in us will have to take new post-human forms so that one may survive the fatal end of our own world. The insistence in an attachment to Earth and to human form is sure to lead us to our extinction rather than prevent it.

All things considered, the new Jonasian imperative may be reformulated drawing upon Huxley's transhumanist criteria: *Act in such a way that the effects of your actions are compatible with the permanence of self-awareness in this and other worlds*. The observance of the preservation of the planet on which we currently find ourselves and its relevance - which is not opposed in the slightest by this thesis – does not exclude the more adequate proposition: *Act in such a way that the effects may ensure the possibility of future self-awareness.* The dangers of inaction are also noteworthy, as a non-action itself falls into the category of action, particularly if the agent detains knowledge of the elements at stake: *May your inaction not endanger the conditions needed for the preservation of self-awareness*. Note that, in not restricting self-awareness to this planet, the versions presented here meet the proposition of avoiding extinction.

Surpassing anthropocentrism requires an understanding of the cardinal tenet of transhumanism: the humankind as we know is not the ultimate goal, but one of the

stages of an incessant cosmic mutation. It is our *conscience*, not our *shape* that endows us with intrinsic value. Though there is no such thing as a *res cogitans* disconnected from the *res extensa* to transhumanist in general, the latter may be shaped or modified as it is but an instrument of the first, which is the one that truly holds intrinsic value.

The seventh point on the *Transhumanist Declaration* reveals a zoocentric ethical system inasmuch as it accounts for every single sentient being instead of simply acknowledging humans. Yet, it does not constitute a classic zoocentrism since it encompasses alien life should it be discovered as well as artificial life forms. Despite being fictitious at present, these hypothetical life forms may well be identified or created at some point in the future. As said on the declaration:

> **We advocate the well being of all sentience, including humans, non-human animals, and any future artificial intellects, modified life forms, or other intelligences to which technological and scientific advance may give rise (VITA-MORE et al: 2013: p. 54).**

The notion of “desirability”, as made clear in the excerpt above, is limited to the *minus bonum*, which refers to the well being of sentient entities, be them human or not. Even though such account goes beyond the anthropocentric perspective, it would not stand as a satisfactory basis for a new ethic. The *minus bonum* offers insufficient grounds to attend the ends of thinking technology and envisioning possible and dangerous scenarios within this process of intentional action imposed on the world. All in all, taking into account the well being of existing individuals does not necessarily entail taking into account the future of the different species and their right to exist. Case in point, the dire state of the planet as it has been serving the purpose of ensuring the well being of contemporary humans. Comfort and well being come at a price, one that has been proven to be very high and with which we find ourselves in debt.

In points three and four, transhumanists subscribe to Jonas' view by also acknowledging the misuse of technology and the risks of an unbridled Promethean impulse:

> **We recognize that humanity faces serious risks, especially from the misuse of new technologies. There are possible realistic scenarios that lead to the loss of the most, or even all, of what we hold valuable. Some of these scenarios are drastic, others are subtle. Although all progress is change, not all change is progress. Research effort needs to be invented into understanding these**

> **prospects. We need to carefully deliberate how best to reduce risks and expedite beneficial applications. (VITA-MORE et al: 2013: p. 54)**

Transhumanists mainly differ from Jonas in the assessment of the risks and proposed ways to avoid the *summum malum*. If on the one hand, transhumanists extol technological development as a means to free us from Earth in order to avoid extinction, Jonas fears such development will lead us to extinction. Jonas's fear resides within the enormous realm of possible scenarios and is not foreordained, whereas the transhumanist fear constitutes a definitive outcome: without technological advancements, all possible scenarios converge in extinction. The fifth point on the *Transhumanist Declaration* propounds:

> **Reduction of risks of human extinction, and development of means for the preservation of life and health, the alleviation of grave suffering and the improvement of human foresight and wisdom, be pursued as urgent priorities and generously funded (VITA-MORE et al: 2013: p. 54).**

Even though the ethical system put forth by transhumanists requires that sentience be regarded as intrinsic value, there is no attachment to Earth to characterise this ethic as ecocentrist. This lack of attachment - far from originating from a lack of concern for the planet - is rooted in the knowledge of our home planet's lapse. Hence, Earth is seen as our starting point, not as our final destination.

Overall, the transhumanist ethical system may be defined as zoocentric, in contrast with Jonas's ecocentric one (the ecocentrism is a type of biocentrism, but in its geocentric form: *biogeocentrism*). The entity endowed with intrinsic value is not even embodied in the intelligent being as it might look at first but in *sentience* itself. Sentience is the imperative to be defended. This premise evokes some classic philosophical questions such as: what is life? What is intelligence and how it differs from sentience? Could life be a cosmic *telos*?

The basis for the defence of a long-term plan able to assure human existence beyond Earth is not anthropocentric as it might seem at first glance. It is not a question of advocating human survival due to the belief that *only* humans are endowed with intrinsic value, but of doing so because only humans - at least so far - are endowed with the intellectual resources that are capable of looking after other life forms. In assuring the existence of humankind beyond Earth, the continuity of the existence of *other* life forms that may be cared for is *also* assured, be they extant ones or possible life forms yet to emerge.

In order to illustrate this, let us contemplate the analogical example of the procedures to be observed in the event of depressurisation inside an aircraft. Adults are instructed to put their oxygen masks on first and only then proceed to assist the children to put them on. This order of priority makes sense because adults are better equipped for problem solving, and not because they are held in higher regard than children. The opposite procedure would increase the risk of the tutor losing his/her conscience, resulting in the deaths of both the tutor and the tutee. To hold that only humans should be entitled to an extended existence due to their unique intrinsic value would be an anthropocentric statement, which is against this thesis. Our intrinsic value stems from our *conscience*, not from our anthropomorphic form much less from our superior intellect.

At this point, it is relevant to duly indicate the distinctions setting conscience and intelligence apart since one is frequently mistaken by the other. As a general rule, "intelligence" is defined as the "capacity to solve problems". Some species are more intelligent than others just like some humans are more intelligent than others. However, no moral philosophy worthy of that title would argue that more intelligent people are imbued with a higher intrinsic value than those less gifted. Therefore, intelligence is of *instrumental* value and there are no moral concerns in stating that Einstein's intellect was instrumentally more valuable than that of the author of this thesis. Nonetheless, it should also be noted that intelligence not only solves problems, it also creates them. Curiosity is a feature of intelligence and there seems to be a proportional correlation between the two. With that in mind, one cannot help reminding that intelligence - the Promethean fire capable of creating marvels - is also capable of inventing nuclear bombs. Fermi's paradox[50] questions the reasons why we are yet to succeed in contacting intelligent extraterrestrial species. A possible answer is that such species would have been so intelligent that curiosity led them to create or investigate some problem dangerous enough to bring them to destruction. Given their instrumental power, intelligence and its creations require ethical regulations that should not be left entirely subject to mere markets. Conscience, on the other hand, is the attribute that allows beings the capacity to feel pleasure or experience suffering, avoiding the last and seeking the first. A cat, a snail, an ant and a human are all capable of experiencing pleasure and suffering. However, only

[50] Enrico Fermi (1901-1954), Italian-American physicist.

humans are capable of persisting in suffering situations by their own will, and it occurs exactly due to the intelligence in high levels. Cows and bees live driven by basic impulses of attraction and repulsion in relation to that which is pleasurable or painful, precisely because of their limited intellect. In humans, the opposite is observed. Humans who are trying to find the solution to a complex mathematical problem, for example, are capable to ignore the organic urges of hunger, sleep deprivation or even an occasional back pain for quite some time because the intelligence in them tends to overcome their consciousness. In light of all this, this thesis argues that intrinsic value stems from the existence of consciousness, not intelligence. Human intelligence is capable of debating the concept of intrinsic value, and this ability may lead to the misperception that it is *the reason* that which makes us intrinsically valuable. Nevertheless, although a dolphin might not be able to do the same, the animal *knows* what is valuable, at least to itself. It *knows*, physiologically speaking, what is good and bad for its own life.

Additionally, it is important to highlight the fact that if the value is *intrinsic*, there is no degree of said value by definition. Degree is a contingency, and thus characteristic of instrumental values: a knife may be more or less valuable than another, a computer may be more or less efficient than another, and so a human may be more intelligent than another. While there are no moral qualms in stating that Einstein is intellectually more valuable than a mentally handicapped individual, it would be abhorrent to suggest there is any difference between them regarding their intrinsic value. Why is it then that human moral establishes distinctions of value between human animals and non-human ones? The answer lies in the anthropocentric paradigm, which not only mistakes consciousness for intelligence as it also instrumentalises animals as if they were nothing more than “things”, or assets. Animals are considered “livestock goods”, according to the Civil Law of most Western countries. When an exception is made, it is always cultural: dogs and cats are humanised, considered to be "part of the family", "our children", just like some Indians humanise cows, calling them "mothers". In none of these cases does the animal possess intrinsic value by right of its own nature so much as due to an extension of our humanising and anthropocentric view. If cats and dogs often seem "human" to us, such notion constitutes a mistake. That which we deem "human" in a dog is, in fact, the animal portion we recognise in ourselves.

The transhumanist ethic parts with this logic. If cats and dogs are considered

to be worthy of being treated with dignity in our society, why not cows, pigs, bees, lobsters and rats? Treating them with dignity does not mean treating them as if they were humans, especially because they are not. The transhumanist point is: dignity should not be a value restricted to human beings.

Ample philosophical debate may unfold from this, such as wondering whether it is ethical to feed from other animals. In fact, many transhumanists like David Pearce[51] in his *The Hedonistic Imperative*[52] will argue we do not. But even non-vegetarian transhumanists concede that we do not have the right to bring intentional harm to any animal whatsoever, but that it does not mean we cannot eat them, only that it is unethical to mistreat them. This debate is not in the scope of the present thesis, but it is worth mentioning that our current technology is already capable of producing meat from the cloning of specific animal cells without killing them[53]. The cost of creating a mere single steak is still high, but keeping in mind the notion that technology tends to become cheaper, maybe in the future it will be possible to have a barbecue without the killing of a single cow.

Critics of the idea of attributing intrinsic value to every sentient being usually contend that only humans are endowed with intrinsic value due to the fact that we are the ones who came up with the very concept. They mistake "word" for "thing". An apple exists even if I do not call it an apple. Ants may not be capable of explaining or rationalising about intrinsic value, but they all know that which is valuable to them. They show understanding of what has value and what does not in their actions. Intrinsic value is an attribute of the sentient living beings.

The aforementioned statement leads us to a new question: what is a "living being"? We adopt here the definition put forth by NASA: *A self-sustaining chemical system capable of Darwinian evolution*[54]. An artificial being could fit the bill of these attributes. Here is a curious provocation written by Ellery[55]:

> **Ever since Erwin Schrodinger penned his monograph "What is life?" (1944) from the perspective of the physical scientist, physicists and engineers have had an enduring fascination with the biological world. Although the question**

[51] British philosopher, co-founder of the World Transhumanist Association.
[52] Available at https://www.hedweb.com/hedab.htm. Accessed in March 11, 2019.
[53] *A closer look at cellular agriculture and the processes defining it*. Available at: https://agfundernews.com/closer-look-cellular-agriculture-and-the-processes-defining-it.html. Accessed in March 16, 2019.
[54] Available at: https://astrobiology.nasa.gov/research/life-detection/about/. Accessed in February 22, 2019.
[55] Alex Ellery, Canadian engineer, and associate professor at Carleton University.

> **posed by Schrodinger appears to defy definitive answers, there is nevertheless substantial agreement on the fundamental properties of life: (i) the ability to self-replicate; (ii) metabolism and growth powered through the ingestion of matter and energy; (iii) cellular encapsulation from the environment; and (iv) the capacity to evolve and adapt to the environment. In fact, this could be reduced to the first three properties because the fourth is derivative from the first two properties through the second law of thermodynamics. Artificial life emphasises exploration of this fourth property of evolution. Unlike synthetic biology in which biological components are configured into engineering functions, we are configuring engineering components into a form of artificial life, not in software but in hardware. We are developing a self- replicating machine. (…) We are using robotics as existence proofs for physical mechanisms of self-replication – a similar approach of using robotics has been used in cognitive robotics and robotic zoology. So, can building an artificial robotic lifeform using engineering materials provide any insight into the astrobiology quest – to understand the limits and scope of life beyond the Earth? I shall leave it to the astrobiology community to decide but it is worth noting that our artificial creature possesses the three properties of life (ELLERY: 2016: p. 67-68).**

Let us then think of a synthetic being, a self-sufficient one, capable of reproducing itself and to adapt to its environment. Would it be alive? If we consider NASA's definition, then the answer is "yes". Would it be intelligent? Yes, it might be even more than the most intelligent human being. But would it be *conscious*? That is a good question to which science does not have the answer and thus constitutes a philosophical quandary around which we can only hypothesise. If this entity, with all its peculiarities, does not avoid suffering, does not seek pleasure and reproduces solely motivated by the imperatives of its programming, how can we say it is anything but an impressive instrument? A computer is capable of solving highly complex math problems but is not proper to say it is aware, much less alive.

Here are some of the philosophical questions that arise: (1) could it be that consciousness depends on the inherent imperfection of organic bodies? Could beings incapable of feeling pleasure or pain be considered intrinsically valuable? Or would they be mere highly sophisticated instruments? (2) Could consciousness emerge from a certain degree of intelligence, even in a synthetic organism? It is a curious question, for it is akin to saying that something intrinsic is born from something instrumental, and thus contingency precedes essence. In nature, the opposite is observed: consciousness (intrinsic value) manifests itself first - even in the most primitive beings - as an indistinguishable part of every life, whereas intelligence (instrumental value) emerges later and in different degrees depending upon the different degree of complexity of the being.

Speculations aside, up to the present moment, what we know for sure is that the human species is the only one endowed with the intelligence capable of assuring the existence of life when Earth and the solar system become non-viable. Technological projects that for now sound like science fiction are quite feasible, such as the terraforming of other worlds, and the creation of new life forms (biologic or synthetic) within these alien contexts, for instance; as well as the creation of autonomous space stations; a genetic database capable of restoring species that have gone extinct not by the course of nature but by the disastrous and anti-ecological actions of our fellow contemporary or ancestors; a possible genetic improvement that could equip us to adapt to alien contexts. The latter is the most ethically disputable, and the trauma of the eugenic ideal of the Nazis is far too recent not to cause a deep discomfort before the idea of human genetic enhancement. This notwithstanding, we must face the fact that the future will require that we adapt to extraterrestrial contexts if we are to survive as a species. The necessary physical enhancements could be carefully studied starting now, lest we are forced to do everything hastily when the real need arises.

Among bioethical models, the only one who is totally opposed to any projects of human space expansion is cosmocentrism, also known as "cosmic preservationism". It is the environmental ethics theory contrary to the idea that terrestrial values should be imposed on alien contexts. The supportive principle of cosmocentric thinking is the premise that there is something *unique* in alien environments, and that this *uniqueness* must be preserved. Cosmocentric ethics is non-utilitarian, precisely because it regards intrinsic value as *inherent in existence itself*, which obviously includes inanimate things, such as Martian rocks. As said by Fogg[56], regarding cosmocentrists:

> **The Cosmos has its own values, they claim, and its mere existence gives it not only the right to exist, but the right to be preserved from any human intent. Such a moral principle we might call the Principle of the Sanctity of Existence, with uniqueness as its basis of intrinsic value. Moral behavior under such a system would involve non-violation of the extraterrestrial environment and the preservation of its existence state (FOGG: 1999: p. 6).**

Taking into account the ethics promulgated by cosmocentrists, it would be correct to affirm that their perspective is incompatible with the first point of the

[56] Martyn J. Fogg (born in 1960), British physicist, and geologist.

transhumanist manifesto, especially in the passage that advocates overcoming human confinement to the planet Earth. Still according to Fogg:

> **In the absence of extraterrestrial life, only preservationism concludes that space settlement would be immoral if it was seen to be to the benefit of terrestrial life (FOGG: 1999: p. 1).**

From the transhumanist perspective, which is zoocentric, it would be permissible to carry out planetary interventions, *as long as* in alien environments in which there is currently no life; *provided that* in order to stimulate the emergence of life within prebiotic contexts; and *provided that* such interventions are able to protect any living planets from extinction events. As sustained by Wilks[57], from a typical biocentrist perspective:

> **(...) I am merely arguing that our moral obligations to them[58] ought to be determined in consideration of the intrinsic value of other living beings – especially those possessing greater intrinsic value. Furthermore, given that, on this view, all life forms have intrinsic value, and that life has value and priority over non-life. I agree with Christopher McKay that it is morally permissible to undertake technological endeavours both (a) to protect and promote the survival, richness and diversity of indigenous, extraterrestrial life forms on other planets, and also (b) to create an extraterrestrial biosphere that could generate and sustain life on planets that do not currently have life (…) (WILKS: 2016: pg. 192-193).**

Intervention is a strong transhumanist goal indeed. Conversely, the cosmocentric ethical principle is based on the assumption that all existing things, whether they are living or not, have the right to be as they are, from a spontaneous construction. This implies that Lunar rocks or Martian clays, for example, have the cosmic right to be what they are. There would be, as it were, an ethos prior to humanity, and to life itself, which is independent of our existence and therefore transcends it. Cosmocentrists advocate that human space policies should establish total interdictions regarding space exploration, even if those alien sites have nothing but rocks. According to Marshall[59]:

> **If Mars, or any other planetary body, is devoid of life, it does not follow that it is devoid of value beyond any resources it may have that are useful to humans. An extension of human ethics to animals and thence to other organisms if taken to the next step would include an extension of ethics to abiotic objects (be they rocks, rivers or ringed planets) even if they do not contribute to a living**

[57] Anna Frammartino Wilks, PhD, University of Toronto.
[58] Microbes.
[59] Alan Marshall, a New Zealand researcher in environmental studies.

> **ecosystem. Although it (N.A.: Mars) might seem to be a great useless hunk of red rock to us, human could, in the view of Martian rocks, be merely living organisms who are yet to attain the blissful state of satori only afforded to non-living entities. (…) We must not consider Mars or any other celestial body to be unlucky just because it does not support life. Indeed, even in the absence of indigenous lifeform, Mars possesses its own uniqueness and diversity, which are worthy to respect (MARSHALL: 1993: p. 227-236).**

In contrast to cosmocentrists, Fogg says that:

> **(…) whilst it is reasonable to propose that animals with advanced nervous systems might have feelings, and therefore a point of view, surely it is gross sentimentality to propose such a thing for rocks. After all, a sentimental terraforming enthusiast might propose that, far from the rocks on Mars existing in a state of "blissful satori" (as a preservationist would have it) they might instead be "crying out for life." Both arguments are unedifying. Rocks don't think, don't act and don't care. They cannot have values of their own (FOGG: 1999: p. 7).**

The transhumanist bioethical model is therefore strongly opposed to any cosmocentric idealisation. This does not allow us to act irresponsibly on alien worlds, since they are elements of significant instrumental value. But it is necessary to keep in mind that rejecting the idea of expanding our existence beyond Earth is flirting with collective suicide.

As seen on the previous presentation of this thesis, extraterrestrial environments as exploitable and colonisable places have occupied human thought ever since Galileo Galilei desacralized the supralunar world, converting it into a *place*. Even with all the evidence, however, humanity remains contrary to the idea of colonising the sky as it was a sacred place. According to Foucault:

> **Now, despite all the techniques for appropriating space, despite the whole network of knowledge that enables us to delimit or to formalize it, contemporary space is perhaps still not entirely desanctified (apparently unlike time, it would seem, which was detached from the sacred in the nineteenth century). To be sure a certain theoretical desanctification of space (the one signaled by Galileo's work) has occurred, but we may still not have reached the point of a practical desanctification of space. And perhaps our life is still governed by a certain number of oppositions that remain inviolable, that our institutions and practices have not yet dared to break down. These are oppositions that we regard as simple givens: for example between private space and public space, between family space and social space, between cultural space and useful space, between the space of leisure and that of work. All these are still nurtured by the hidden presence of the sacred.[60]**

[60] FOUCAULT, M. *Of Other Spaces.* Available at: http://web.mit.edu/allanmc/www/foucault1.pdf. Accessed in February 22, 2019. Translated from the French by Jay Miskowiec.

We still think of Earth and Cosmos as separate things, as if the latter were a kind of sacred, impenetrable zone, whose access is wholly or partially vetoed. It is this sacralisation still present in human thought that grounds rhetoric contrary to the space research with arguments of order of economic, religious or scientific importance. The average citizen does not recognise the value of space research and tends to judge such investments as a waste of resources. A social perception survey commissioned by NASA in 2004 concludes that:

> **NASA does not have a branding problem; it has a communication problem, in that people do not understand the connection between the NASA brand and its current activities. While NASA has many stories to tell about their accomplishments, people don't have the scientific training to evaluate their technical importance within the brand. (…) when asked to judge between two competing arguments in which they have little or no expertise, people will default to the more compelling vision. NASA is not currently communicating a compelling overarching vision that reflects their brand in the minds of the public. (…) Today American society seems to have returned to the attitudes of the mid 1950s. The public believes manned space flight to Mars and other planets is possible. But they don't believe the government should billions of dollars to do it.**[61]

Social resistance to investment in space exploration can be understood by considering the fact that, despite the human brain is highly developed it is not so different from the brain of our prehistoric ancestors. Natural selection was won by those good enough to evaluate short-term events and get instant gratification in the form of promising partnerships, food and water. Although it is known that it is necessary to save for the old age or for the education of the children, the tendency of the average citizen is to spend more than it should, as if there were no tomorrow. The immediatist behaviour observed in individuals finds its reflection amplified in a pattern quite similar not only in the public policies built by governments, as in the policies of private companies. Space exploration is considered "frivolous" for not offering a satisfaction that is identified in a short-term basis. However, as an illustrative example of our brain's cognitive failure to make judgments regarding what is valuable, here is the NASA's 2004 annual budget compared to the spending of US citizens with alcohol, tobacco, gambling and junkie food[62]:

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[61] *American Perception of Space Exploration: A Cultural Analysis for Harmonic International and The National Aeronautics and Space Administration*. Washington: 2004. Available at: http://www.hq.nasa.gov/office/hqlibrary/documents/o55201537.pdf. Accessed in February 22, 2019.
[62] Idem.

Category	Total amount spent (average value in ten years – American dollars)
NASA budget	16 billion
Junkie food sales	110 billion
Alcohol and tobacco sales	170 billions
Legalised gambling	350 billion

Despite our collective resistance to the idea of a post-human space expanse, we are potential world builders, able to establish ethical plans that enable life to keep its existence and even to flourish in other worlds. And we, as "masters of this world", are endowed with remarkable powers and incredible technology. We can destroy everything, we can keep pretending Earth is an everlasting blue pearl or we can assume the protection of our world and existence as a moral duty. We can even ensure that other worlds flourish with life. As the fifth topic of *Transhumanist Declaration* says,

> **(…) reduction of risks of human extinction and development of means for the preservation of life and health, the alleviation of grave suffering and the improvement of human foresight and wisdom, must be pursued as urgent priorities and generously funded (VITA-MORE et al: 2013: pg. 54).**

We should urgently think of what our duties as rational beings are. As the fictional *Starchild* in Clarke's *2001 – A Space Odyssey*, we are looking at our own planet with fascination, and the power of life and death, creation and destruction, *eros* and *thanatos*, lays on our hands. Future generations depend on our urgent space expanse. For a while, our *ethos* is still based on hope, and we are playing with the wishful thinking that our existence is special, protected, guaranteed. We strongly believe there is a kind of "cosmic super father" who takes care of us. Maybe there is indeed, but as we are going to discuss in the next chapter, what if this God has sacrificed His power in order to allow our existence? And what if He depends on us instead of we depend on Him? These are the issues on which this thesis focuses in the next chapter.

2. Metaphysics: the emergence of a cosmic awareness.

Thermodynamic miracles... events with odds against so astronomical they're effectively impossible, like oxygen spontaneously becoming gold. I long to observe such a thing. And yet, in each human coupling, a thousand million sperm vie for a single egg. Multiply those odds by countless generations, against the odds of your ancestors being alive. Meeting. Siring this precise son, that exact daughter, until your mother loves a man she has every reason to hate, and of that union, of the thousand million children competing for fertilization, it was you, only you, that emerged. To distill so specific a form from that chaos of improbability, like turning air to gold... that is the crowning unlikelihood. The thermodynamic miracle. (…) But the world is so full of people, so crowded with these miracles that they become commonplace and we forget. We gaze continually at the world and it grows dull in our perceptions. Yet seen from another's vantage point, as if new, it may still take our breath away. Come... dry your eyes. For you are life, rarer than a quark and unpredictable beyond the dreams of Heisenberg. The clay in which the forces that shape all things leave their fingerprints most clearly. Dry your eyes... and let's go home[63]*.*

2.1. Transhumanism and metaphysics: initial considerations.

This chapter outlines a few metaphysical hypotheses with the aim to provide grounds for the ethical proposal of biocosmic expansion presented in this thesis. The question from which we started is: *in the case of an existing cosmic telos, what role humankind poses in this supposed project?*

First and foremost, it is worth to note that there is no dependence of ethics upon metaphysics as has been deftly demonstrated, for instance, by Hume[64] (HUME: 2003: p. 372). The fact that he stated that

> **(…) If we take in our hand any volume of divinity or school metaphysics, for instance; let us ask, *does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of act and existence?* No. Commit it then to the flames: For it can contain nothing but sophistry and illusion (HUME: 2003: p. 222).**

did not preclude Hume from investigating the principles of morals. And yet, metaphysical systems or truths inevitably ensue specific ethical systems. It is the main purpose here to introduce a hypothetical system whose metaphysical qualities lead to an ethical system sustained as a thesis: *the ethic of desperation*, and the imperative of a biocosmic expansion.

It is true that it would have been possible to uphold this system while ignoring the considerations made in this chapter. Overall, the ethics of the transhumanist movement is not guided by metaphysics. Despite this, in order to propose an ethical

[63] Doctor Manhattan, in: "Watchmen", a 1987's comic book, by Alan Moore.
[64] David Home (1711-1776), better known as David Hume, Scottish philosopher.

system underpinned by the opposition to a classic theological virtue (hope) - as it is intended here - one cannot dispense with contesting some metaphysical truths laid out by the main monotheistic religions. In every case and in different ways, hope provides us with the fortitude to endure the afflictions of existence. Such is, for example, the hope of the coming of the Messiah (Judaism), or even the hope of an eternal and perfect life in Paradise – as a matter of fact, the Christian *trasumanar*, as coined by Dante. The ethic of desperation as an alternative to the ethic of hope, as shall be seen, is more properly defended from cosmological standpoints – or even from cosmogonical ones as put forward by Jonas - and such considerations demand propositions of a metaphysical nature.

It should be noted that while most transhumanists tend to be quite dismissive of religious dogmas, there are those who acknowledge some common grounds between transhumanism and faith. As pointed out by More:

> **The content of some religious beliefs is easier to reconcile with transhumanism than the content of others. Christian transhumanists, while not completely unknown, are very rare (…). There are more Mormon transhumanists (although some of these are cultural rather than religious Mormons), perhaps because that religion allows for humans to ascend to a higher, more godlike level, rather than sharply dividing God from man. Several transhumanists describe themselves as Buddhists (presumably of the secular, philosophical type), and there seem to be few obstacles to combining transhumanism with liberal Judaism. However, the vast majority of transhumanists do not identify with any religion. A pilot study published in 2005 found that religious attitudes were negatively correlated with acceptance of transhumanist ideas. Those with strong religious views tended to regard transhumanism as competing with their beliefs (Bainbridge 2005) (MORE: 2013: p. 8).**

Its penchant for materialism, physicalism and functionalism does not make the transhumanist movement impliable to supra-empirical matters. Perhaps the most recurrent metaphysical hypothesis among transhumanists, as More ponders, is:

> **(...) the idea of the world as simulation. As computers have become ever more powerful, simulations for both scientific and ludic purposes have proliferated and rapidly grown in sophistication. Although humans have always lived their lives entirely in the physical world as revealed by the unmediated senses, we may come to spend much of our time in simulation environments, or in "real" environments with virtual overlays. Simulated worlds raise questions about what we value. For instance, we do value the experience of achieving something or *actually* achieving it, and how clear is the distinction (Nozick 1974)? Taking this line of thinking further, transhumanists from Hans Moravec to Nick Bostrom have asked how likely it is that we are *already* living in a simulation (Moravec 1989; Bostrom 2003) (MORE: 2013: p. 8).**

Nonetheless, the view that the world consists of a virtual simulation merely reallocates the existence of a "reality". If we live in a virtual world, there is nothing to say reality does not exist somewhere else. Unless we account for Buddhist perspectives that state all worlds are simulations and thereby nothing akin to a "reality" exists.

There is however a metaphysical question in the history of philosophy that tends to be wrongfully underestimated by the transhumanist movement. That question is: does our universe have a *telos*? It is the purpose of this thesis to argue that *whether* the suggested metaphysical system be correct, Huxley's *inescapable responsibility* has a fundamental role in the realisation of this *telos*, given that this supposed cosmic end is not *ensured by itself* despite the spike in the odds that is due to both the grand scale of the universe and its likely splitting into multiple quantum possibilities.

In the hopes of minimising the chances for misunderstandings, it is crucial that we establish the proper distinction between *metaphysical systems* and *metaphysical truths* before we move on to cover such aspects. These are not the same and this work intends to demonstrate the pillars that uphold *systems* rather than state *truths*.

2.2. On systems and truths.

Duhem[65] determines that the study of physics (i.e. the study of *things*[66]) logically precedes that of metaphysics (i.e., of the *causes*). This organisation, as Duhem points out, is not in alignment with that established by peripatetic philosophers, as the motions and modifications of things were of the domain of physics to them. To Duhem, these very same motions are object of study of the field of cosmology, which to the philosopher belongs in the realm of that which is called "metaphysics" (DUHEM: 1996: p. 30). In respecting this logical order wherein physics must precede metaphysics, we will be better equipped to obtain answers if we are to derive them from the observation of a phenomenon. Conversely, if the order is reversed, it is reality that has to fit in a given explanation, even if that means to

[65] Pierre Maurice Marie Duhem (1861-1916), French physicist, and philosopher of Science.
[66] *Things* are considered in three phases: the observation of facts; the discovery of laws; and the construction of theories (DUHEM: 1996: p. 30).

preserve appearances before the insistence of the world of things in contradicting the metaphysical belief[67].

That is not to say physics cannot be understood from a metaphysical standpoint. The issue of the matter is that such procedures are prone to grave errors. Among these errors, one noteworthy mistake is that of establishing a mono-causal scheme wherein "A" causes "B". Even if "A" *unequivocally* incurs in "B" – thereby the full understanding of the causes allows for a full understanding of the effects - knowing the effects of "B" does not equate with the absolute certainty that "A" is its *unequivocal* cause. The same effects might have been produced by different causes. Human understanding is limited and allows us to grasp an imperfect knowledge of the *raisons d'être* of things at best (DUHEM: 1996: p. 43-44). Hence the critical need to distinguish *metaphysical systems* from *metaphysical truths*. According to Duhem, metaphysical truths are characterised as:

> **(...) a very incomplete and imperfect knowledge of the essence of material things. This knowledge proceeds more through negation than through affirmation, more by the exclusion of some hypotheses that might be made about the nature of things than by positive indications of that nature (...) To understand this essential point properly, it is important never to confuse the *truths established by metaphysics* with *metaphysical systems*. The truths of metaphysics are propositions few in number and, for the most part, negative in form, which we obtain in ascending from observed phenomena to the substances which cause them (DUHEM: 1996: p. 33).**

Conversely, a metaphysical system:

> **(...) is a collection of positive judgments – although hypothetical for the most part – by means of which a philosopher seeks to relate metaphysical truths among themselves in a logical and harmonious order. Such a system is acceptable provided none of the hypotheses composing its conflicts with an established metaphysical truth. But it remains always highly problematic and never forces itself on reason in an unavoidable fashion (DUHEM: 1996: p. 33).**

Having established this distinction, it is now appropriate to underscore how all considerations presented in this thesis consist of metaphysical *systems,* never *truths*, in keeping with Jonas, who was careful enough not to refer to his works as "truth",

[67] Such is the case, for instance, of first stating the metaphysical truth that supra-lunar world is immutable and eternal and therefore conclude shooting stars can be nothing else but atmospheric phenomena. Or even blaming the dirty lens of Galileo's telescope to deny the unexpected imperfections observed on the surface of the moon. No matter how much reality contradicts the metaphysical truth, it is reality that ends up being denied or even "adjusted" to accommodate the presupposed truth.

but rather as a *cosmogonical supposition*[68]. Although Duhem defends a radical separation between physics and metaphysics, warning against mixing the two fields together for we would be bound to give comfort to the cause of positivism as a result (DUHEM: 1996: p. 34-38), it should be stressed that an exception is made: *when metaphysical hypotheses contemplate astronomical matters*. As put by Duhem:

> **On the subject of the relations between physics and metaphysics, Aristotle and the peripatetic philosophy admitted a thesis which essentially agrees with the one we have developed. They made little use of it <u>except in astronomy</u>, the only branch of physics which was developed at that period, but what they said about the motion of the stars can be extended readily to other natural phenomena (DUHEM: 1996: p. 40).**

By way of example concerning the admissibility of hypotheses presented by metaphysical systems within an astronomical setup, Duhem reminds us of the instance when Copernicus added a summary under the title *A Little Book of Nicolas Copernicus on the hypotheses of the celestial motions put together by him*[69] in his book *Revolutions*. Let us highlight the way Copernicus addresses the reader: *if our different assumptions, called axioms, are admitted*[70] (COPERNICO: 1984: p. 9).

What Copernicus proposed was an *alternate explanation* to the celestial display. He had no means to demonstrate his model empirically and the Ptolemaic model provided explanations that were sufficiently satisfactory. The advantage of the Copernican model over the Ptolemaic one, which stands out as a decisive distinction, is that the first has proven to be more elegant and to require fewer explanatory elements than the latter[71]. In other words, between two hypotheses that may equally account for a given phenomenon, the one judged most adequate is the one that requires fewer entities to support it. This principle of restricted entities does not constitute *any guarantees* that the simplest explanation be the true one, which is not a constraint since the purpose of a metaphysical hypothesis is not to be certain of its assertions. They are thought experiments.

In conclusion, there are two important considerations that should be observed if this chapter is to be fully and correctly understood. The first aspect to be

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[68] In his book *Materie, Geist und Schöpfung. Kosmologischer Befund und Kosmogonische Vermutung*.
[69] This summary is currently known as *Commentariolus*.
[70] From the original in Latin: *si nobis aliquae petitiones, quas axiomata vocant, concedantur.*
[71] If the Earth is to be accepted as the centre of the system rather than the Sun, epicycles and deferents must be established in a way that explains the apparent retrograde motions of the planets in relation to an observer from Earth. If the Sun is the centre, the entities “epicycles” and “deferents” become unnecessary to justify said retrograde motions.

considered is how difficult and even imprudent and pretentious it is to explain the universe from a standpoint of metaphysical *truths*. Physical knowledge, as established by Duhem, is elaborated based on experimental/observational methods, which are not dependent on metaphysics. The need for this independence is paramount in light of the self-evident limitation of human intelligence. Anyone who engages in mixing physics with metaphysics is claiming to possess an angelical intelligence. According to Duhem:

> **(...) An intellect which had a direct intuitive view of the essence of things – such as, according to the teaching of the theologians, an angel's intellect – would not make any distinction between physics and metaphysics; such an intellect would not know successively the phenomena and the substance – that is, the cause of these phenomena. It would know substance and its modifications simultaneously. It would be much the same for an intellect that had no direct intuition of the essence of things, but an adequate – though indirect – view through a beatific vision of divine thought (DUHEM: 1996: p. 31-32).**

The second consideration states the importance of not confusing *truth* and *system* here. That said it is worth to once again stress that at no point a *metaphysical truth* is presented in the present thesis. It is the burden of this thesis to defend a *system* all the while underpinned by the Copernican and Jonasian caution. Saying that "if we are to admit that" and "if we suppose that" is the complete opposite of saying "we assert that". In order to successfully achieve the defence of said system, it is relevant to consider that which must come first in logical order: *the physical things*. Any reverse procedure to the one previously detailed here would take the shape not of philosophy but of theosophy, as some form of unveiled truth.

We thus now move on to the hypotheses that give support to the metaphysical system of this thesis.

2.3. Life, sentience, and intelligence: is there a cosmic *telos*?

Humankind has wondered throughout the centuries, and in a number of varied ways, whether the universe has an *entelekheia* or not. As conceived by Aristotle, "entelechy" is a quality possible to all existing things - inanimate ones included – and it represents a transformative process wherein the potentiality of something is realised in action. Such concept is at odds with the Platonic philosophy as it places the cause for the development of things in the exterior (the "world of ideas").

However, if on the one hand it is possible to easily sustain the idea that a peach seed has the development of a peach tree as its *telos*, and that this fully grown tree is the entelechy of the seed that originated it, on the other hand, applying the same analogy to the universe is a hard and polemic endeavour. A peach tree - the final cause of a peach seed - requires time and space to be realised. Whether in proper soil or never planted, the seed shall forever remain a tree in potential but not in action. It is thus possible to assert that the final cause of the seed was not realised due to the lack of an adequate place. Regardless of that, we can still know its entelechy from a seed of the same nature, which has been properly grown. Every potentiality requires a *topos* (place), a *chronos* (time) and often times a *kairós* (opportune moment) for the realisation of an action.

Thereupon lies the first hindrance: contrary to seeds or any other existing thing that may be compared with the intent of verifying the difference between its dormant potentiality and the action, there have been so far no means by which to compare our universe to another. Moreover, the universe does not require time and space as a context. It *is* the time and space where the potentialities are realised, on account of which the assertion that emerging elements within the universe constitute finality tends to be regarded as a sophisticated tautology by the positivists. Nevertheless, numerous were the times when the universe was argued to have a finality throughout the history of philosophy. All of these propositions share the same teleological argument, which defends the existence of an ordering force that goes by many names: force, intelligence, God. Despite all of them having the hypothesis of a *telos* in common, these names are not be taken as synonyms. “Force” has a very specific meaning with very distinctive implications from those of “intelligence”, for example. The concept of “force” does not imply “intelligence” (intentional action), let alone “goodness”. It is possible to argue in defence of a universe with a *telos*, and still not believe that it answers to our prayers, for instance.

Although there are many forms of teleology, the idea that the emergence of life is a cosmic imperative or finality derives from a considerably elaborated teleological defence. The physical-teleological argument in its most ingenuous form evokes elements such as the beauty of a flower, the symmetry in nature, and all the things human perception sees as "pleasant", which would then imply they would have been created by a kind of *intelligent designer*. This form of ingenuous teleological argument is thus marked by a flagrantly anthropocentric bias. Whereas

the cosmic teleology in its non-anthropocentric form explores the evidence that points to our universe being structurally biophilic, *id est*, prone to the emergence of life. Life's form would be contingent but its existence necessary. That is to say that even if life is a cosmic inevitability, there are still no guarantees that it shall endure or even evolve towards the development of awareness or intelligence.

It is possible to find among transhumanists those who defend the hypothesis that not only life but also mind and intelligence constitute cosmic finality. Following the inevitable surge of sentient beings (humans, aliens or artificially conceived entities), said beings would go on to contaminate the cosmos with intelligence to the point the universe would awaken and become capable of generating its own baby universes. This sort of belief – or wager - is found among authors such as Gardner[72], whose main thesis concerns an emerging cosmic mind:

> **The hypothesis of selfish biocosm asserts that the anthropic qualities which our universe exhibits might be explained as incidental consequences of a cosmic replication cycle in which the emergence of a cosmologically extended biosphere could conceivably supply two[73] of the logically essential elements of self-replication identified by the mathematician and computer pioneer John von Neumann. Furthermore, the hypothesis implies that the emergence of life and intelligence are key epigenetic thresholds in the cosmic replication cycle, strongly favored by the physical laws and constants which prevail in our particular universe (GARDNER: 2007: p. 170-171).**

Gardner says in another similar article:

> **The central assertions of the SB[74] hypothesis are: (1) that highly evolved life and intelligence play an essential role in a hypothesized process of cosmic replication and (2) that the peculiarly life-friendly laws and physical constants that prevail in our universe—an extraordinarily improbable ensemble that Pagels dubbed the cosmic code (Pagels, 1983) — play a cosmological role functionally equivalent to that of DNA in an earthly organism: they provide a recipe for cosmic ontogeny and a blueprint for cosmic reproduction. Thus, a key retrodiction of the SB hypothesis is that the suite of physical laws and constants that prevail in our cosmos will, in fact, be life-friendly. Moreover — and alone among the various cosmological scenarios offered to explain the phenomenon of a bio-friendly universe — the SB hypothesis implies that this suite of laws and constants comprise a robust program that will reliably generate life and advanced intelligence just as the DNA of a particular species constitutes a robust program that will reliably generate individual organisms that are members of that particular species[75].**

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[72] James N. Gardner (born in 1946), American writer and complexity theorist, author of *The Biocosm Hypothesis*.

[73] These "two logically essential elements" are a controller, and a duplication device.

[74] Selfish biocosm.

[75] Originally published in *The International Journal of Astrobiology* (May, 2005). Reprinted on http://www.kurzweilai.net/the-physical-constants-as-biosignature-an-anthropic-retrodiction-of-the-selfish-biocosm-hypothesis (February 28, 2006). Accessed in December 16, 2018.

Gardner's hypotheses bring one of Teilhard de Chardin's[76] most significant works to mind. The thought expressed in *The Phenomenon of Man* allows us to consider him a proto-transhumanist. Despite the differences between Gardner's and Chardin's approaches, they converge at (1) their conviction of the emergence of life as constituting final cause to the cosmos; (2) an optimism regarding the transformation of this potentiality into action. Summing it up broadly, we may assert that Chardin proposes an orthogenesis, *id est*, the idea that evolution happens in a unidirectional trend toward a supposed "omega point", where all consciousness is to be reunited with Christ. Not surprisingly, it is Julian Huxley himself - the first to coin the term "transhumanism" in the XX century – who is the author of the introduction to the most widely known issue of *Phenomenon*:

> **The different branches of science combine to demonstrate that the universe in its entirety must be regarded as one gigantic process, a process of becoming, of attaining new levels of existence and organisation, which can properly be called a genesis or an evolution. For this reason, he[77] uses words like *noogenesis*, to mean the gradual evolution of mind or mental properties, and repeatedly stresses that we should no longer speak of a cosmology but of a cosmogenesis. Similarly, he likes to use a pregnant term like *hominisation* to denote the process by which the original proto-human stock became (and is still becoming) more truly human, the process by which potential man realised more and more of his possibilities. Indeed, he extends this evolutionary terminology by employing terms like *ultra-hominisation* to denote the deducible future stage of the process in which man will have so far transcended himself as to demand some new appellation (HUXLEY: 1947: p. 12).**

Although the present thesis is in agreement with the hypothesis that *the emergence of life characterises a strong cosmic tendency in our universe*, Chardin and Gardner's evolutional optimism is not conceded here. In that regard, in light of this higher affinity, Jonas's admonitions must be referred to:

> **The reader will, however, find nothing here of the evolutionary optimism of a Teilhard de Chardin, with life's sure and majestic march toward a sublime consummation. He will find life viewed as an experiment with mounting stakes and risks which in the fateful freedom of man may end in disaster as well as in success. And the difference from Chardin's as also from other, and better conceived, metaphysical success will, I hope, be recognized as one not merely of temperament but of philosophical justness (JONAS: 2001: XXIV).**

[76] Pierre Teilhard de Chardin (1881-1955), French philosopher and Jesuit priest
[77] A reference to Chardin.

If we are to reject the guarantees offered by Chardin's thesis, we still have to address the radical teleological rejection established by the scientific method since the XVII century. It is worth clarifying that this rejection is more concerned with that which is understood as the anthropocentric fantasy encouraged by the major monotheistic religions - the one that preaches the universe is made for the enjoyment of the human type - than with the concept of final causes. There is, as it shall be demonstrated, *physical* evidence that the cosmos is biophilic and even capable of favouring the emergence of life[78].

2.4. Cosmic physical constants.

Goal 7 of the National Aeronautics and Space Administration's Astrobiology Institute (NAI)[79] contemplates the importance of finding methods to recognise biosignatures around the universe. In respect of this objective, astrophysicists and astrobiologists employ the available technical tools in order to detect at least some good indication that there is or there has ever been another world capable of supporting life forms as we know them. These investigations encompass empirical approaches, such as when, on September of 2003, the Galileo probe detected *in situ* that the Jovian moon Europa had an ocean far more voluminous than that of the Earth. In regard to extremely distant worlds-as is the case of exoplanets - the use of spectroscopy allows us to identify which worlds are Earth-like[80].

In this thesis, we define biosignals as a set of measurable factors classified into two types: (1) biosignals as *potency*, capable of identifying physical or mathematical conditions that make the existence of life or its future emergence possible, which characterises the environment as biophilic; (2) biosignals as an *action*, understood as biosignatures and capable of identifying environments where life effectively emerged and exists (post-biotic worlds). While the detection of chlorophyll would fall under the type-2 biosignal category, something like the

[78] Considering here that *anthropos* concerns the human, the primate form. As transhumanism sees it, the human form is a stage, not a final cause. That would be awareness.
[79] NASA Astrobiology Roadmap, printed on: https://nai.nasa.gov/media/medialibrary/2013/09/AB_roadmap_2008.pdf. Accessed in December 16, 2018.
[80] Exoplanets that have rocky composition, are Earth-size, and capable of maintaining surface liquid water. Currently, there are ten good candidates among all known exoplanets, according to the Planetary Habitability Laboratory of Arecibo, in Puerto Rico: http://phl.upr.edu/projects/habitable-exoplanets-catalog. Accessed in December 16, 2018.

presence of water in liquid state would be characterised as a type-1 biosignal, which makes the Jupiter moons Europa, Enceladus and Io good candidates for astrobiological investigation. Likewise, an exoplanet[81] orbiting a certain star at a specific distance and being thus suitable for harbouring liquid water would also be considered a type-1 biosignal, regardless of the lack of any indication of life. In essence, type-1 is characterised by *potency*: one or more identifiable and measurable hallmarks whose presence alters the existence of life from merely *possible* to *probable* whereas type-2 is an *action*: probability converted into fact.

Gardner, in turn, argues that:

> **Goal 7 of the NASA Astrobiology Roadmap states: "Determine how to recognize signatures of life on other worlds and on early Earth. Identify biosignatures that can reveal and characterize past or present life in ancient samples from Earth, extraterrestrial samples measured *in situ*, samples returned to Earth, remotely measured planetary atmospheres and surfaces, and other cosmic phenomena." The cryptic reference to "other cosmic phenomena" would appear to be broad enough to include the possible identification of biosignatures embedded in the dimensionless constants of physics. (…) According to the SB[82] hypothesis, the laws and constants of physics function as the cosmic equivalent of DNA, guiding a cosmologically extended evolutionary process and providing a blueprint for the replication of new life-friendly progeny universes[83].**

In the excerpt above, Gardner alludes to Rees's [84] postulation that reality is shaped by six numbers that are "fine-tuned"[85] in order to permit the existence of life. Any modifications to these numbers, no matter how negligible, would make life impossible. These six numbers are (REES: 1999): (1) **N**, the electrical forces that hold atoms together, divided by the force of gravity between them, which result in 10^{36}. If **N** were feebler, the universe would be short-lived and so small that no living beings larger than insects could develop; (2) the number **ε**, whose value is 0.007, defines how firmly atomic nuclei bind together. Stellar chemosynthesis transmutes hydrogen into all other existing elements so that every single atom in our universe has been forged within stars. Some elements are quite common, like carbon, and

[81] For example: TRAPPIST-1e, planet located 39 light-years from our solar system.
[82] Selfish biocosm.
[83] GARDNER, J. *The Physical Constants as Biosignature: An Anthropic Retrodiction of the Selfish Biocosm Hypothesis.* Originally published in *The International Journal of Astrobiology* (May, 2005). Reprinted on http://www.kurzweilai.net/the-physical-constants-as-biosignature-an-anthropic-retrodiction-of-the-selfish-biocosm-hypothesis (February 28, 2006). Accessed in December 16, 2018.
[84] Martin John Rees (Born in 1942), British astrophysicist, and cosmologist.
[85] The phrase "fine-tuned" presents a number of issues, the main one being the fact that it implies somebody or something was responsible for the tuning. It is entirely possible to make the case for an accidental tuning as shall be demonstrated.

hydrogen. Some of them are rare, like uranium. If **ε** were different, molecule could not be formed, and life could not exist; (3) the number regards to the amount of matter in our universe, which includes dark matter as well. If its value overcame a critical point, the cosmos would have already collapsed. Conversely, if this number were lower than a critical point, the consequence would be a starless cosmos; (4) **λ** is a new force only discovered in 1998, which refers to an antigravity that controls the cosmic expansion. It is so subtle that its effects are not discernible on scales lower than a billion light-years. If **λ** were stronger, stars and galaxies would have been precluded from forming; (5) **Q** is a number (about 0.000001) that represents the ratio of two fundamental energies. A smaller **Q** would result in an inert cosmos. If larger than the actual number, **Q** would produce a universe replete of giant black holes, a cosmos hostile to life; (6) last but not least we have the number **D**, the most known among all of them: the number of spatial dimensions. Life, as we know it, could not exist in a two-dimensional or four-dimensional[86] reality.

That indicates most astrophysicists tend to agree with the view that our universe is strangely biophilic. As a result, those who adhere to the existence of a cosmic *telos* are quick to find in this fact the basis for the argument that these numbers show such an astounding degree of fine-tuning that it cannot be coincidental thus signalising the existence of an ordering intelligence. To them, life would not constitute a contingent attribute of the universe, but a necessary one. It is the *form* life takes that is contingent instead. In an even bigger leap of faith, these principles - as expressed by Chardin in his *Phenomenon* - are considered *anthropic*, *id est*, the human type would then be the final cause of the universe, as a product of the cosmological logos whereas Gardner considers the mind - not the human type - to be a final cause. Given the fact that such mind could arise in alien entities whose physiology would possibly be radically different from ours it is not without reason that Gardner's allusion to an anthropic principle in his articles is frequently accompanied by the reservation of inverted commas.

Nonetheless, philosophical rigor demands that we do not overlook in Gardner's article the fact that he considers these physical constants to be *biosignatures*. As previously explained, said physical constants are better classified as *type-1 biosignals*. "Biosignatures" belong in the set of type-2 biosignals given that

[86] Time is considered a fourth dimension, but, unlike the other three, time is seemingly irreversible.

the term *signature* means “the act of signing”. Therefore, the distinction between a “sign” and a “signature” is based on the difference between potency and act. NASA’s definition conveys that *all biosignatures are characteristic of the modification of a local or planetary environment by life*[87], which means the American agency only considers to be “*biosignatures*” those characteristic described as type-2 in this thesis. In that case, it is said that *A biosignature is an object, substance and/or pattern whose origin specifically requires a biological agent*[88] (i.e., an action). Still, both the American and the European spatial agencies (NASA and ESA, respectively) dedicate their efforts toward investigating worlds whose biosignals are type-1, for they present better odds of finding type-2 biosignals.

To acknowledge that the universe is biophilic is to acknowledge that it is so due to numbers so precise that any slight difference in them would render it barren. Biophilia would thus be a necessary characteristic of the universe and not merely contingent. Positivists are likely to criticise the phrase “fine-tuning”, arguing that the term itself is controversial as it implies that *something* or *someone* must have been responsible for said tuning. Indeed, if we base ourselves on Chardin’s work, we can see very clearly that he deals with a cosmological logos wherein life’s evolutionary march is regarded as an inexorable story of success toward the cosmic Christ. It is Jonas himself who challenges his ideas by saying that:

> **“Information” requires for itself, as its physical substrate, a differentiated and stable system. For living things, this would be the genome with its molecularly full articulation and constancy (for the computer it would be the magnetically spelled-out programming or “software”). Information, therefore, is not only a cause, but already a result of organization. It is a deposit and expression of something previously attained, which is perpetuated through this information, but not surmounted by it. Now *neither* articulation *nor* stability have a place in the totally undifferentiated and dynamic "substance" (hypothetically speaking) of the "Big Bang" or in any "chaos" at all. For this reason, the hypothesis of a cosmological "logos" – in general, every pre-established programming and systematic arrangement – dwelling already in developing matter right from the start, is eliminated as an explanatory model of development. Briefly put, information is something stored, and the “Big Bang” had no time for storing anything (JONAS: 1996: p. 167).**

Despite not being available since the beginning of time due to both a genetic and logical impossibility, information or *logos* appears at the heart of matter thanks to

[87] NASA Astrobiology Roadmap, printed on: https://nai.nasa.gov/media/medialibrary/2013/09/AB_roadmap_2008.pdf. Accessed in December 16, 2018.
[88] Idem.

the transcending factor which is, as explained by Jonas, the Darwinian factor of *copying error*. In the absence of error, without chaos or disorder, information would be bound to reproduce *ipsis litteris* to the end of time. In reality, significant mutations have occurred throughout the cosmic history: the primordial hydrogen turned into helium, stars were born and so were the galaxies and life emerged with all its interiority. Only then the *logos* emerged. This subjectivity is a fundamental ontological feature of the being, for it is from this standpoint that the universe contemplates itself and attributes value to things. But if there was no information present at the time of the Big Bang, how could we understand the emerging universe *before* the cyclical order fit for supporting life was established? It is Jonas who, once again, offers an answer, contending that no guarantees existed. Rather, there was an incidental possibility of interiority. A mere possibility is not to be confused with a positive willing Being (*Angelegtsein*) since there was no purpose but a yearning, a tendency at best. Jonas asserts that *willingness* is the most there is to it - certainly not a plan - and for that reason he coins the phrase *cosmogonic eros* in contrast with *cosmological cosmos* (JONAS: 1996: p. 172). Finality follows the emergence of life instead of preceding it. Jonas avers:

> **Life is its own purpose (*Selbstzweck*), i.e., an end actively willing itself and pursuing itself. Purposiveness as such, by means of its eager "yes" to itself, is infinitely superior to that which is indifferent, and can easily be seen for its part as the purpose – the secretly longed-for goal – of the entire undertaking of the universe which otherwise seems so empty. This means that right from the beginning matter is subjectivity in its latent form, even if aeons, plus exceptional luck, are required for the actualizing of this potential. Only this much about "teleology" can be gleaned from the evidence of life alone (JONAS: 1996: p. 173).**

There are however other problems to be considered when talking about a supposed cosmic biophilia:

The first problem is an issue of a contingency and necessity order. How these values relate is unknown. Modifications imposed on one could lead to changes in another and if such is the case, there would be nothing "special" in the way our reality is shaped. The numbers described by Rees would not be necessary but contingent and life would come about, one way or the other. It should be noted, however, that even if the numbers are contingent and follow in tune with one another, if we are to contend that life would inevitably emerge, it follows that we attribute a quality of necessity to its existence.

The second problem contemplates the possibility that our universe is but one among many others and could thus be an accident where life emerged while many other universes would be devoid of stars. Universes solely constituted by hydrogen molecules, for instance. As outlined by Rees:

> **These six numbers constitute a "recipe" for a universe. Moreover, the outcome is sensitive to their values: if any one of them were to be "untuned", there would be no stars and no life. Is this tuning just a brute fact, a coincidence? Or is it the providence of a benign Creator? I take the view that it is neither. An infinity of other universes may well exist where the numbers are different. Most would be stillborn or sterile. We could only have emerged (and therefore we naturally now find ourselves) in a universe with the "right" combination (REES: 1999).**

Rees' considerations take us to the next metaphysical wagers of this thesis: there are other universes (countless or infinite ones), this can be demonstrated and their existence raises the odds of the teleology of life. A teleology that, as put forward by Gardner, Chardin and Jonas alike - observing the differences[89] among them – is characterised by the emergence of a cosmic super-mind.

2.5. On the existence of multiple universes.

Addressing the existence of multiple universes in this thesis is two-fold: (1) to demonstrate that the elements of *guarantee and optimism* present in Chardin's thesis *Phenomenon* pale before a multiverse scenario once not even microrganisms – let alone the cosmic mind - could emerge in sterile universes. The universe in which we find ourselves then would cease being *necessary* and would thus move under the category of merely *contingent*. It is true that the possibility of a multiverse in Gardner's thesis presented in *The Intelligent Universe* does not pose any great disturbances given that the feasibility of the emergence of a cosmic intelligence in this universe - but not necessarily in another - is inconsequential. Gardner is not committed to the possibility of a pre-existing divinity but to that of an emerging and future super-entity, a *natural God*. Chardin's optimistic thesis built on certainty and necessity is challenged by a multiverse constituted of universes where nothing is

[89] To Gardner, the spread of intelligence and consequent contamination of the whole universe, which would lead to the emergence of the cosmic mind; to Chardin, the guaranteed and inevitable return of Christ; to Jonas, the possible- but not guaranteed- resurrection of the God who sacrificed himself so that the universe could exist.

realised; (2) on another note, to demonstrate that the concept of a multiverse considerably raises *chance*, a fundamental element in Jonas' *alternative speculation of cosmogony* (JONAS: 1996: p. 189-191), which tells the story of a God who abdicates his own power so that the universe may exist, wherein the human type is perhaps - and only perhaps - tasked with reconstituting Him.

We shall resume Jonas' speculations further ahead. For the present, suffice to bear in mind that his heuristic of fear is guided precisely by the risk of us destroying said *chance*. It follows that *if* Jonas is right concerning his cosmogonical speculations, we have a God who plays a game. Why He chooses to do so is something to which Jonas provides no answers and it is not the intention of this thesis to offer one. This thesis intends, however, to demonstrate that this "God who plays a game" and who voluntarily becomes *omni(m)potent* - a meaningful neologism - does not place His bets on a single universe. It does so on many others, perhaps on infinite others and although multiplicity does not constitute any guarantees, it certainly raises the probabilities. That is to say that although Chardin is not justified in his optimism, Jonas in his turn could find some peace in his heuristic, given that the chances are better than those conceived by him.

There are at least two distinct manners to argue for the existence of multiple universes. One of them is by means of a pure exercise of the philosophy of the mind, which regards the infinite possible scenarios as ontologically real as the scenario where the author of this thesis and its readers are. According to Lewis[90]:

> **There are so many other worlds[91], in fact, that absolutely *every* way that a world could possibly be is a way that some world *is*. And as with worlds, so it is with parts of the worlds. There are ever so many ways that a part of a world could be; and so many and so varied are the other worlds that absolutely every way that a part of world could possibly be is a way that some part of world is (LEWIS: 1986: pg. 6).**

Id est, when we say that something is "real", we refer to the universe in which we find ourselves. Lewis's thesis[92] defends that every possible universe is real, even the most bizarre ones ever imagined and our own universe is not any more real than

[90] David Kellogg Lewis (1941-2001), American philosopher.
[91] In this particular subchapter, the term "worlds" is always to be read as a synonym for "universes" and not of "planets". This word choice aims to be in keeping with the terminology used by Lewis and other authors such as the physicist Hugh Everett III.
[92] Lewis's ideas on multiple universes seem to be based on Anselm's traditional ontological argument, which attributes actuality to God because of the idea of God. This is very evident in one of his early papers, *Anselm and Actuality* (1970).

any other. Anything conceived as possible is effectively possible, and in some universe Harry Potter is enrolling in magic classes at Hogwarts. Dracula the vampire is being hunted down by Van Helsing. There are, however, substantial differences between Lewis' modal realism and the thesis defended here. Although the present thesis advocates the existence of other universes, Lewis conceives them as *disconnected*:

> **There are countless other worlds (…) and they are not remote. Neither are they nearby. They are not at any spatial distance whatever from here. They are not far in the past or future, nor for that matter near; they are not at any temporal distance whatever from now. They are isolated: there are no spatiotemporal relations at all between things that belong to different worlds. Nor does anything that happens at one world cause anything to happen at another. Nor do they overlap; they have no parts in common with the exception, perhaps, of immanent universals exercising their characteristic privilege of repeated occurrence (LEWIS: 1986: p. 6).**

Contrary to Lewis, this thesis subscribes to the notion that some universes are *intersectional*, i.e., not only do they exist but they also interfere with one another on a physical level. Said interference is weak but sufficiently clear to be subject to identification. Moreover, Lewis defends that every possibility necessarily entails existence, which introduces an element of guarantee whose implications are tantamount to Nihilism: if anything that could ever come into existence does exist, fighting for anything would thus be pointless, for things will have been actualised in some universe regardless. This *guarantee*, as shall be seen in the last chapter, constitutes the opposite of life force, which is realised by way of tension, doubt, uncertainty, and desire.

The difference between this thesis and Lewis' is not limited to the ontology of the multiple universes but to the reason why its existence should be seriously considered. To Lewis, the modal realism thesis is a *useful exercise*. In his words:

> **Why believe in a plurality of worlds? – Because the hypothesis is serviceable, and that is a reason to think that is true. The familiar analysis of necessity as truth at all possible worlds was only the beginning. In the last two decades, philosophers have offered a great many more analyses that make reference to possible worlds, or to possible individuals that inhabit possible worlds. I find that record most impressive. I think it is clear that talk about *possibilia* has clarified questions in many parts of philosophy of logic, of mind, of language, and of science – not to mention metaphysics itself. (…) As the realm of sets is for mathematicians, so logical space is a paradise for philosophers. We have only to believe in the vast realm of *possibilia*, and there we find what we need to advance our endeavours (LEWIS: 1986: p. 8).**

This thesis, in turn, sustains that the multiplicity of universes is not just a useful mental/philosophical exercise but a fact whose demonstration requires (1) some considerations regarding the philosophy of science; (2) a physical experiment – namely, on the behaviour of light. These points are both contemplated by Deutsch[93] in his work *The Fabric of Reality* as shall be described ahead.

Let us thus delve into the first point. According to Deutsch, the assumption that science is produced from empirical experiments and then validated by the reproduction of said experiments within the constraints of laboratories is a common scientific misconception. Although such experiments are necessary, it is the *explanation* that stands as science's defining feature, for there can be no science without it. Throughout history, numerous were the times when the simple observation of the behaviour of light altered our understanding of the universe completely. The observed phenomenon remained the same. The understanding drawn from it, however, was different. In order to illustrate this, let us consider the following examples:

Copernicus' heliocentric hypothesis is largely grounded on the fact that, in placing the Sun in the centre of the system in lieu of the Earth, the explanation given to describe the planetary orbits is made much simpler. The position of the stars marked by dots of light in the night sky was less aberrant this way. Notwithstanding the technological constraints that did not allow him to send a probe to space in order to provide confirmation of heliocentrism, Copernicus offered a more reasonable *explanation* than the one that previously stood[94].

While the Copernican heliocentric theory rightly placed the Sun in the centre of the system, it also held that the planets moved in circular orbits. There was a slight, almost undetectable inaccuracy between the calculated position shown in the ephemerides of the time and the real sunlight reflected by the planets in the sky. By correcting the calculations, Kepler was able to conclude that the orbits were supposed to be elliptical rather than circular. The light was not where it was supposed to be and so Kepler proposed *an alternate explanation* for the phenomenon despite lacking our current technological advances.

[93] David Elieser Deutsch (Born in 1953), Israeli-born, British physicist.

[94] The previously accepted explanation, which was based on Ptolemaic cosmology, although reasonable, demanded more complexity. The sophistication in the Ptolemaic model "salvage", so to speak, the positioning of the Earth in the centre of the system as propounded by Aristotle.

As for Newton[95], he *explained* the ellipses proposed by Kepler with the inverse square law of gravitational force. With time, it became clear that, in light of Newton's law, the attraction among planets was bound to cause tiny perturbations in the elliptical orbits. As these perturbations were noticed, or, put in other words, thanks once again to the light being observed to not be where it was supposed to be, astronomers figured there ought to be another planet besides Uranus and sure enough, Neptune is discovered in 1846, further validating Newton's theory.

Centuries later, knowledge of the nature of space and gravity was once again amplified due to aberrant behaviours of light. The solar eclipse of 1919 in the Brazilian town of Sobral[96], for one, allowed Crommelin[97] to confirm the *explanation* propounded by Einstein that stated that space is *curved* which causes the light of the stars to suffer double the expected deflection as they pass by the Sun. Once more, the observation of the eclipse took into consideration the fact that light did not behave as expected.

The finitude of our universe is relatively simple to evince and its explanation has been largely accepted in astrophysics up to this point. The behaviour of light makes said *explanation* possible even though it cannot be proven empirically. Let us take daylight for instance first. That which we call "day sky" is not the way it is due to the reasons one could draw from common sense, which would tell us the reason why we have daylight is that the Sun is above the horizon at a particular location. That, however, is only partially true. Even if the Sun finds itself above the horizon of the Moon, its sky remains in the dark. Our planet differs in that because it is surrounded by an atmosphere whose composing gas molecules scatter the small fraction of sunlight beamed at us. Considering the existing hundred billion stars in our galaxy, should our universe be eternal or spatially infinite, there would be no "night sky". Each and every observable corner of the sky would be filled with the visible light of a star or galaxy, even if the Sun finds itself on the other side of the horizon. This is not so because there has not been enough time for the light to reach us. *Id est*, the universe is immense but finite.

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[95] Isaac Newton (1643-1727), English mathematician, physicist, and philosopher.

[96] Although a different team had travelled to São Tomé and Príncipe in order to observe the eclipse, the meteorological conditions did not allow proper observation. It fell to the other team lead by Crommelin to obtain images of the same eclipse in Sobral. Crommelin's photographic plates clearly showed a luminous deflection of 1.98, confirming Einstein's predicted calculations.

[97] Andrew Claude de la Cherois Crommelin (1865-1939), British astrophysicist.

All aforementioned examples help illustrate how far considerations on light distortions, be they sophisticated or trivial, can trigger significant changes in the way we understand reality. The continuing sophistication of our measuring instruments such as the telescope has allowed us to identify minute details. The greater the minutia, the more refined our understanding of reality becomes. Such was the case of the measurements of light in the Sobral eclipse: a minimum difference in the deflection was sufficient to make apparent to us that space is curved.

Despite our current ability to verify some things directly, such as the fact that the Sun is the centre of the system rather than the Earth, other things are not guaranteed even if they consist in explanations that have virtually achieved a consensus in contemporary science. Space curvature and even the existence of dark matter are indirectly inferred facts and therefore subject to the proposition of new different explanations for the same observed phenomena. Scientific theories do not gain credence - as some naive instrumentalists are likely to contend - because of the predictability of a given experiment. Practical or laboratory physics usually conducts reproducible experiments whose results are the cornerstone of the subsequently derived generalisations that will serve as the basis for a certain theory. This procedure is correct. To reckon that the credibility of a theory is based singularly on its replications is however a mistake which is clearly inductive and false on many levels, regardless of how induction may provide us with information that allows us to bet – though never assure – that a given theory will hold true. As elucidated by Popper[98], it is not – contrarily to what is usually attributed to the author - the mere falsifiability of the experiment that confers validity to a given scientific theory but the *explanation* provided by the theory in question.

Reproducibility and statistic frequency are necessary but insufficient conditions to validate a theory. Inconsistent and incorrect predictions render the explanation unsatisfactory, but precise predictions do not necessarily equate with correct explanations and a consistent theory[99]. As highlighted by Deutsch:

[98] Karl Raimund Popper (1902-1994), Austrian-British philosopher of science.

[99] Let us contemplate astrology, for instance: that an astrologer makes ninety per cent correct predictions - no matter how objective they may be - is irrelevant. Despite this high rate of accuracy, the explanation offered for the astrological phenomenon remains inconsistent: if the cause is "planetary influence", how is it exerted? Why can this force of influence not be measured? If there is no such influence, then what is the cause for the correct predictions? Astrology could present objective and accurate predictions - all the while allowing them to be reproduced - but it would still be impossible to deem it "astrological science" in the absence of an explanation for the phenomenon, so "astrological knowledge" is appropriate instead. The distinction made here between the terms "science" and

> **What we need is an explanation-centred theory of knowledge: a theory of how explanations come into being and how they are justified; a theory of how, why and when we should allow our perceptions to change our world-view. Once we have such a theory, we need to separate theory of predictions. For, given an explanation of some observable phenomenon, it is no mystery how one obtain predictions. And if one has justified an explanation, then any predictions derived from that explanation are automatically justified too (DEUTSCH: 1997: p. 61).**

Another common misconception is conditioning theories to the reproducibility factor. In these instances, there is the preponderant illusion that theories provide definitive understanding when they actually convey *the best possible understanding at a given moment*. According to Deutsch:

> **In science the object of the exercise is not to find a theory that will, or is likely to, be deemed true forever; it is to find the best theory available now, and if possible to improve on all available theories. A scientific argument is intended to persuade us that a given explanation is the best one available. It does not and could not say anything about how that explanation will fare when in the future it is subjected to new types of criticism and compared with explanations that have yet to be invented. A good explanation may make good predictions about the future, but the one thing that no explanation can even begin to predict is the content or quality of its future rivals (DEUTSCH: 1997: p. 62).**

An important criterion for a good explanation is avoiding metaphors and analogies. Although analogies may play a role in abridging explanations, it is a very delicate cognitive resource, as the qualities of an entity are lent to another. As remarkable as resemblances may be, an analogy does not equal identity and should never disregard the differences in any shape or form. If we are to establish that “A” is to “B” as “C” is to “D”, that might be efficient in terms of communication, perception and emotion and as a mnemonic device but it does not resist the scrutiny of an analysis that will lay bare grave flaws in the analogy. One may explain that “cats” are to “lions” as “dogs” are to “wolves”, but the analogy will prove to contain serious issues from the moment we start investigating the differences in the relation between the entities cat/lion and dog/wolf.

When it comes to scientific explanations, the use of metaphors is even more delicate since it evokes highly imprecise symbolic meanings that are a tell tale sign of the difficulty in elaborating an efficient explanation. If we assert that “A” behaves *as if*

"knowledge" is established by the element of explanation, which is present in the first case but absent or void in the second.

it were “B”, in reality, we do not know how “A” really behaves. We just assume that its behaviour is *reminiscent* of “B”.

All things considered, we shall see ahead that metaphors and their typical linguistic constructions impregnated with “as if” are present in one of the most important contemporary scientific theories: the quantum interference theory. The contaminating metaphors and analogies must be eliminated so that the explanation may be perfected.

Since this thesis is a philosophical one and this chapter makes reference to a physical experiment, it is necessary to describe said experiment to the lay ones. To that intent, we use the description provided by Deutsch:

If we consider any artificial light-emitting device, and gradually distance ourselves from it without taking our eyes off of it, the reflector bulb will seem ever smaller to the point it will look like a puny dot. Given enough distance, the light will disappear altogether, or, to be more accurate, we shall no longer be able to see it, although it lingers at the same place. The flashlight experiment is trivial and the derived conclusions would be frivolous if we limited ourselves to the constraints of our human senses to lay the basis for our conjectures If that were to be our approach, we would incur in a naive empiricism. Trusting the conclusions derived from senses of well known limited nature is everything we do not need when the issue at hand is doing science.

The flashlight experiment would differ greatly if it were to be described by a frog. Deutsch uses a frog as an example due to the fact that this animal has eyes that are several times more sensitive than the best available human sight, so much so that a frog would never lose sight of the light after distancing from it[100]. The light will not disappear nor become dimmer, it will *flicker*. The longer the distance between the frog and the flashlight, the longer will the intervals between flickers be so that at a distance of one hundred million kilometres the interval between flickers will be of a whole day. However, that light will be perceived as bright as at any other observed distance. It is possible to realise light does not become uniformly fainter as it does when our human eyes are involved. The flickering, whose brightness shall remain unaltered, has in its intervals the indication of the distance. These flickers demonstrate that if light is spread, there are physical limits to this. The flickers

[100]We know this thanks to our knowledge of the eyesight capacity of frogs. We are able to mimic this capacity with the use of highly sensitive photomultipliers after passing light through dark filters

detected by the retina of the frog's eye or by the photomultipliers are not the result of the "light dimming " due to the distance of a given luminous object. That which we call "light" is the perception we have of the trillions of photons that form a beam. The further away the frog is from the flashlight, the further away the individual photons are from each other. And so, thanks to the remarkable features of its sight, the frog is able to detect each photon. The light did not turn "fainter", it was the distance between photons that became larger.

As a result of all the properties previously described here, photons are said to be *particles*. The term *quantum* may be attributed to any existing measurable thing; such is the case of light here. If we were to be guided by our senses, we would come to the conclusion that light always travels in a straight line. And yet, relatively simple experiments show light bends. Even more curiously, they show light is no more ductile than, for instance, a gold thread. Suppose that a beam of light goes through the whole of a perfectly opaque screen; next, it goes through another hole of a smaller diameter in an otherwise identical opaque screen arranged in perfect parallel alignment; and thus proceeding successively, screen after screen of ever smaller holes and light starts to behave oddly. As it passes through holes not as small as a millimetre or so in diameter, the light begins to spread, to fray. The smaller the hole is, the more the light frays, generating patterns of intercalated light and shadow.

At this point, it is relevant to note that gold can be drawn into threads one ten-thousandth of a millimetre thick. That means a hole this size could fit a gold thread but not a light beam. Could this be due to the "size" of the photon? Could it be possible to determine the "size" of the luminal particles? If so, would a photon be larger than an atom of gold? Therein lies the problem: in physics, photons are traditionally said to have "zero weight" since they are considered to be elementary particles deprived of dimensions. Curiously enough, atoms – no matter how small- do have a size. The smallest of all, hydrogen, measures 53 picometres radius, i.e., $53*10^{-12}$ metres. The atom of gold measures 174 picometres radius or $174*10^{-12}$ metres. What stands out as curious is that something measurable- the gold thread - can go through a ten-thousandth of a millimetre hole whereas the theoretically massless light deviates when going through the very same hole.

Suppose we emit a laser beam [101] through two parallel slits spaced one-fifth of a millimetre apart on an opaque barrier. The following pattern of shadows is then cast on a wall standing three meters away from the apparatus:

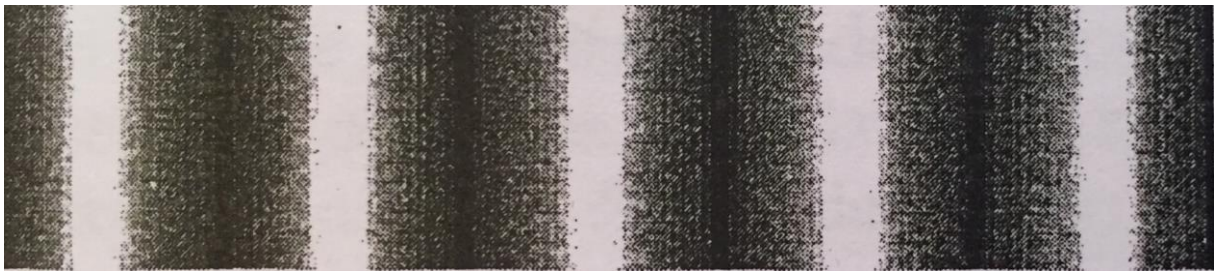

Figure 1: the shadow pattern. The real image obtained from the description of the experiment has been enlarged here[102].

The resulting shadow pattern indicates light does not travel in a straight line and frays when passing through the small slits of the opaque barrier. If light travelled in straight lines and did not fray, the result produced would consist in a single pair of bright bands whose edges would be sharp. The remainder would be dark. On the contrary, not only do we have many bright bands, but we also have shadows ranging from pitch black to penumbras.

What would happen if we added to the same opaque apparatus another pair of identical slits spaced one-tenth of a millimetre apart? Common sense might lead us to expect that two pairs of slits produce the same pattern though brighter, and more blurred. What follows, in reality, is nothing of the sort. Let us observe the result of the second experiment in figure 2. With the intent to make the differences clear, Deutsch contrasts the results of the second experiment (a) with the results of the first experiment (b):

[101] A red laser is chosen in lieu of a flashlight due to the fact that the shape the shadows may take heavily depends on the colour of the light that casts it. White light is a mixture of all colours and thus it casts shadows of multi-coloured fringes. Even if we used a monochromatic filter over a flashlight, the filter would not be as discriminating as a laser, which could be tuned to emit a particular color, virtually removing all other colours of the spectrum.

[102] Images extracted from Deutsch's work, *The Fabric of Reality*.

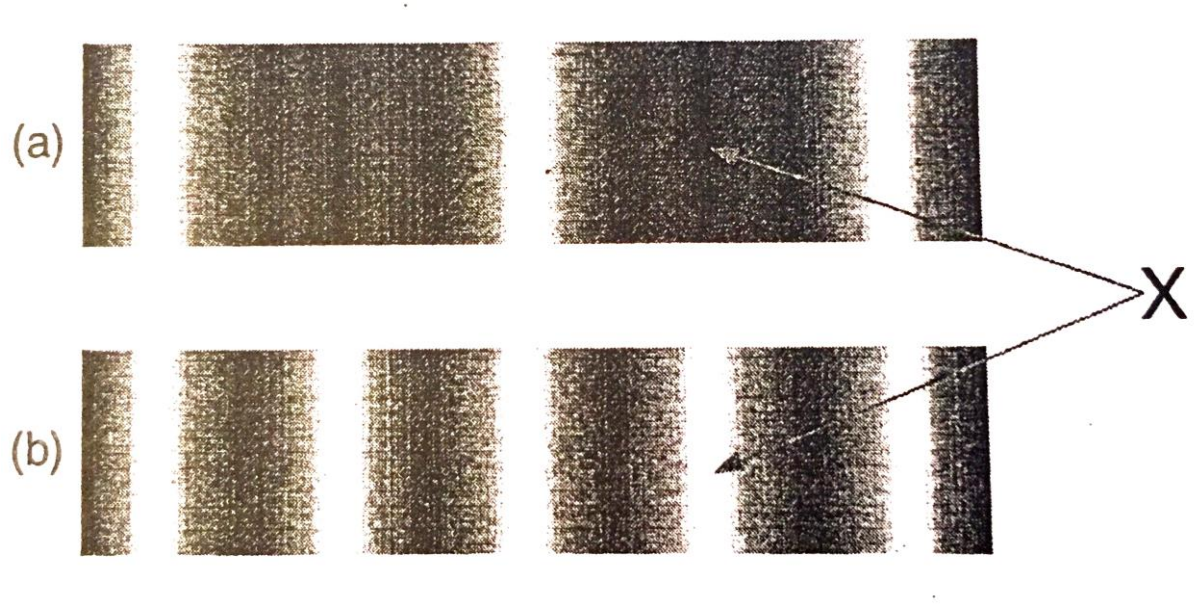

Figure 2: the shadow pattern, comparison between experiment 2 ("a") and experiment 1 ("b"). The real image obtained from the description of the experiment has been enlarged here [103].

The counter-intuitive phenomenon appears in the area defined in figure 2 as "X". The area was bright when there were two slits, but darkened when we doubled the number of slits.

A possible but invalid explanation would be that as the two photons crossed the slits, they collided and the collision made them deviate, causing them to hit a different place on the wall. It is possible to demonstrate this explanation is invalid by conducting the experiment one photon at a time. If it were true that the photons collided with each other in the second experiment generating the dark "X" area, sending a single photon at a time should be enough to prevent the collision from happening altogether. In spite of this, in conducting the experiment in such fashion, the pattern of shadows cast *is exactly the same*. As we send one photon at a time, a pattern - chaotic and incoherent at first - is gradually formed up to the moment when it reveals the exact same image "a" shown in figure 2. Hence the question is posed once again: if a single random photon goes through the opaque four slit apparatus, *what does explain this organised pattern at the end after many photons have been sent?*

It is worth mentioning, especially to those foreign to physics, that the nature of light has been subject to much controversy throughout the history of science. At first,

[103] Image extracted from Deutsch's work, *The Fabric of Reality*.

western civilization characterised light as being constituted by particles [104] ; conjectures progressed to later on regard it as a wave[105]. At the turn of century XIX to century XX, however, the wave nature of light started being questioned due to contradictions made clear in photoelectric emission experiments. Drawing upon Planck's ideas[106], Einstein demonstrated that a light beam is not a wave, rather, it is constituted by "packets of energy" called "photons".

The nature of light has been considered dual ever since, and the currently accepted theory is that of wave-particle duality: as light propagates through space, it behaves like a wave; as it hits a surface, it behaves like a particle. The "wave-particle duality" is the current mainstream *explanation*, finding little resistance.

Nonetheless, in the eyes of Deutsch, Everett III [107], DeWitt [108] and other physicists who subscribe to the notion of the multiple worlds (*many-worlds interpretation*, henceforth referred to as MWI), there is a serious explanatory issue in these considerations concerning the nature of light. We encapsulate this alleged issue with that which has been previously mentioned: *resorting to metaphors, and analogies, which overtly indicate the lack of knowledge of what is actually happening*. That is precisely what happens when a scientist says it is as *if* light were both wave and particle.

It is not the prediction of the phenomenon of the double slit experiment that is being questioned. The prediction remains the same and so do the methods and instruments applied just like those used by Ptolemy and Copernicus with a century between them. It is the *understanding* of the phenomenon that changes. What the proponents of MWI defend is *another explanation*. An explanation based on realism, free from metaphors and analogies.

Let us return to the experiment: it is known that something[109] interferes with the passage of the photon as it goes through any of the four slits, redirecting it to apparently random points on the wall. Something, however, goes through he other slits, colliding with the only photon sent. This "thing", whatever it is, cannot be seen

[104] With atomism, from Epicurus (341 BC – 271/270 BC) to Lucretius (99 BC – 55 BC.), including Newton's theories (1643-1727), and his followers in the centuries XVII and XVIII.
[105] As defined by Huygens (1629-1695), and also defended by Grimaldi (1618-1663), as well as demonstrated by means of experiments conducted by Young (1773-1829) and Fresnel (1788-1827), and later on by Maxwell (1831-1879).
[106] Max Karl Ernest Ludwig Planck (1858-1947), German theoretical physicist.
[107] Hugh Everett III (1930-1982), American physicist.
[108] Bryce DeWitt (1923-2004), American theoretical physicist.
[109] Said thing could not be another identifiable photon, given that we are sending one at a time.

or directly detected, but makes its presence known. What could this "thing" be? As explained by Deutsch, *it is precisely another photon, though of a different nature than that of those that have been emitted:*

> **I shall now start calling the interfering entities "photons". That is what they are, though for the moment it does appear that photons come in two sorts, which I shall temporarily call *tangible* photons and *shadow* photons. Tangible photons are the ones we can see, or detect with instruments, whereas the shadow photons are intangible (invisible) – detectable only indirectly through their interference effects on the tangible photons (…) What we have inferred so far is only that each tangible photon has an accompanying retinue of shadow photons, and that when a photon passes through one of our four slits, some shadow photons pass through the other three slits. Since different interference patterns appear when we cut slits at other places in the screen, provided that they are within the beam, shadow photons must be arriving all over the illuminated part of the screen whenever a tangible photon arrives. Therefore there are many more shadow photons than tangible ones. How many? Experiments cannot put an upper bound on the number, but they do set a rough lower bound. In a laboratory, the largest area that we could conveniently illuminate with a laser might be about a square meter, and the smallest manageable size for the holes might be about 10^{12} (one trillion) possible hole-locations on the screen. Therefore there must be at least a trillion shadow photons accompanying each tangible one (DEUTSCH: 1996: p. 43-44).**

A *shadow photon* would thus be undetectable by observers, but its effects could be detected by its interaction with the tangible photons accompanying it. To each photon sent, at least a trillion other shadow photons follow it. The phenomenon of the interference occurs - as can be experimentally demonstrated - with any type of particle. According to Deutsch:

> **Thus we have inferred the existence of a seething, prodigiously complicated, hidden world of shadow photons. They travel at the speed of light, bounce off mirrors, are refracted by lenses, and are stopped by opaque barriers or filters of the wrong colour. Yet they do not trigger even the most sensitive detectors. The only in the universe that a shadow photon can be observed to affect is the tangible photon that it accompanies. That is the phenomenon of interference. (...) Interference is not a special property of photons alone. Quantum theory predicts, and experiment confirms, that it occurs for every sort of particle. So there must be hosts of shadow neutrons accompanying every tangible neutron, hosts of shadow electrons accompanying every electron and so on. Each of these shadow particles is detectable only indirectly, through its interference with the motion of its tangible counterpart (DEUTSCH: 1996: p. 44).**

To the collection of tangible particles, be they photons, neutrons or electrons, in other words, to the reality directly perceived in its whole, we give the name of *universe*. Such particles interact among themselves and constitute that which we call *matter*. Supporters of MWI define shadow particles as belonging to *other universes*. As put by Deutsch:

> **(...) they do not form a single, homogeneous parallel universe vastly larger than the tangible one, but rather a huge number of parallel universes, each similar in composition to the tangible one, and each obeying the same laws of physics, but differing in that the particles are in different positions in each universe. (DEUTSCH: 1996: p. 45)**

Evidently, we could call this set containing all these supposed universes "universe", but this new definition would be at odds with the existing one so that the word *multiverse* will henceforth be used to convey the reunion of all universes – ours and the supposed parallel ones. Each universe has an extremely week effect on the other but this interaction is strong enough to be perceived in interference experiments.

Here is a conundrum: the phenomenon of interference is incontrovertible, and yet MWI is accepted, but only for a minority of physicists. The vast majority subscribes to the *Copenhagen interpretation* (CI). It just so happens that this majority of adherents of the CI, according to the arguments of MWI supporters, derive their stance from *metaphorical assumptions*. Asserting that the photon behaves *as if* it were colliding with virtual photons explains nothing about the behaviour of the photon. Saying that light behaves *as if* it were both wave and particle at the same time is nothing short of admitting the lack of knowledge on the behaviour of light. The circumstances are salvaged by the use of a metaphor that will state in every case: *it is as if...*

Whereas MWI supporters take an ontologically realistic stance, that removes the "ifs" and any other metaphorical features or analogous resources. As stated by Deutsch:

> **(...) The key fact is that a real, tangible photon *behaves differently* according to what paths are open, elsewhere in the apparatus, for something to travel along and eventually intercept the tangible photon. Something does travel along those paths, and to refuse to call it "real" is merely to play with words. "The possible" cannot interact with the real: non-existent entities cannot deflect real ones from their paths. If a photon is deflected, it must have been deflected by something, and I have called that thing a "shadow photon". Giving it a name does not make it real, but it cannot be true that an actual event, such as the arrival and detection of a tangible photon, is caused by an imaginary event such as what that photon "could have done" but did not do. It is only what really happens that can cause other things really to happen. If the complex motions of the shadow photons is an interference experiment were more possibilities that did not in fact take place, then the interference phenomena we see would not, in fact, take place (DEUTSCH: 1996: p. 48-49).**

Assuming MWI is true, we would then be faced with the following aspects: (1) multiple universes exist. It is not known whether these universes are, as suggested by Lewis with his modal realism, infinite. Despite this, according to Deutsch, it is possible to establish the minimum figure of a trillion; (2) every particle has its counterpart in another universe; (3) the interference occurs exclusively among particles of the same nature. A tangible photon cannot be affected by another universe photon; (4) the interference can only be detected when it occurs among particles of very similar universes. In the experiment previously explained in particular**,** the difference between the parallel photons is their position**.** In a hypothetically existing universe in which the speed of light is different, the parallel photon will not affect the photon in our reality; (5) the particles in our universe are in their turn shadow particles in other universes; (6) since the collective of particles forms that which we know as "matter", at this very moment there are at least a trillion versions of the reader reading a trillion versions of this thesis, written by a trillion alternative versions of the author. But contradicting Lewis, no actual Harry Potter nor Dracula. The Big Bang did not create a single universe but countless ones whose existence we can detect through the phenomenon of interference. Jonas' cosmogonical speculations take place not in a single scenario. Rather, the game and *chance* are actualised in at least a trillion more scenarios.

2.6. On wagers.

By way of general conclusion, we anticipate questions likely aroused from the topics brought up in this chapter: does it befit philosophy to be speculative? Jonas provides a good answer when he says the ban on metaphysics is an attempt of philosophy to mimic natural sciences. The "flights of thought" warranted by philosophy should, however, be performed from time to time, constituting a typical venture that Jonas calls *philosophia perennis* and practiced by the likes of Plato, Spinoza, Hegel, Leibniz and many others who dared to speculate about the universe (JONAS: 1996: p. 193-194). We may, therefore, add that considering all these classic philosophy characters speculated and drank from their rich intuition, it makes no sense that we should bar ourselves from this endeavour. Especially if we consider the cosmological data they lacked and that we now find at our disposal, such as the physical constants aforementioned here and our understanding of quantum physics,

which point us in the direction of more accurate intuitions. It is also noteworthy to mention that contemporary theoretical physicists do not shy away from such speculative ventures. Thus it makes no sense whatsoever that philosophy of all things be prohibited from exercising speculation. In doing so, we would be killing *thaumázein*, or *wonder*, the driving force of philosophy from its very early days. Furthermore, as explained from the onset of this chapter, none of the content presented here is intended to hold the value of a metaphysical truth. The intended proposition is that of a system grounded on the interpretation of physical data.

One might also ask: why labour these questions in a thesis committed to conclusions of an ethical nature? As previously said, there is no dependence of ethics upon metaphysics, even though it is possible to derive a wager from this type of lucubration. By way of illustration such is done by Pascal[110], when he tells us in his *Pensées* that it is better to bet on the existence of God, given that infinite gains or losses are at stake:

> **(…) you must wager. It is not optional. You are embarked. Which will you choose then? Let us see. Since you must choose, let us see which interests you least. You have two things to lose, the true and the good; and two things to stake, your reason and your will, your knowledge and your happiness; and your nature has two things to shun, error and misery. Your reason is no more shocked in choosing one rather than the other, since you must of necessity choose. This is one point settled. But your happiness? Let us weigh the gain and the loss in wagering that God is. Let us estimate these two chances. If you gain, you gain all; if you lose, you lose nothing. Wager, then, without hesitation that He is. "That is very fine. Yes, I must wager; but I may perhaps wager too much." Let us see. Since there is an equal risk of gain and of loss, if you had only to gain two lives, instead of one, you might still wager. But if there were three lives to gain, you would have to play (since you are under the necessity of playing), and you would be imprudent, when you are forced to play, not to chance your life to gain three at a game where there is an equal risk of loss and gain. But there is an eternity of life and happiness. And this being so, if there were an infinity of chances, of which one only would be for you, you would still be right in wagering one to win two, and you would act stupidly, being obliged to play, by refusing to stake one life against three at a game in which out of an infinity of chances there is one for you, if there were an infinity of an infinitely happy life to gain. But there is here an infinity of an infinitely happy life to gain, a chance of gain against a finite number of chances of loss, and what you stake is finite. It is all divided; where-ever the infinite is and there is not an infinity of chances of loss against that of gain, there is no time to hesitate, you must give all. And thus, when one is forced to play, he must renounce reason to preserve his life, rather than risk it for infinite gain, as likely to happen as the loss of nothingness (PASCAL: 2003: 233)**

[110] Blaise Pascal (1623-1662), French mathematician, physicist, and Catholic theologian.

As shall be argued, there is a wager in place, but in this bet subject and object are inverted in relation to Pascal's classic wager. It is not the human type who has to bet on God's existence. Rather, it is God who, from the very beginning of it all, has been betting on the human type. Drawing upon Jonas once again, we are led to understand it is God – *if* we are to consider His existence - who effectively depends on us. This sustains the imperative evoked by Huxley, father of contemporary transhumanism: *we are not entitled to more rights than other beings. Rather, we have a bigger responsibility within the framework of existence*. This responsibility, according to transhumanists such as Gardner and Kurzweil, is to spread life and consciousness throughout the universe, raising the odds for survival and precluding the final entropy. Huxley does not address these ideas in his original article, despite verging upon the proposition of the emergence of an awoken universe in his introduction to Chardin 's *Phenomenon*.

But what God is this to whom this thesis alludes? The word is complicated due to the myriad of meanings that come to surface when evoked. As shall be seen, His past existence is admissible and it is highly likely that He voluntarily abdicated his own power *to play a game without any guarantees of success*. Therefore, we now move on to the proper elucidations:

Anselm's ontological argument may be summarised in the following proposition *God exists in the mind as an idea; therefore, God necessarily exists in reality*. Since even atheists bear the idea of God in their minds, to Anselm, the existence of divinity is ontologically inescapable. Whereas some transhumanists hold that *God exists in the mind as an idea; therefore, a natural God will exist in reality*, which characterises a temporal transfer of the ontological argument: the idea of God does not stem from His previous existence, rather, it reveals above all the wish to bring Him into existence. As previously established, myths, with all their gods and hybrid creatures are not to be interpreted as metaphors but as yearnings and even the saints of monotheistic religions rival ancient pagan deities when it comes to performing supernatural deeds. Where shall this yearning that more and more propels us as a species toward a – at the same time both dangerous and wondrous – enhancement that could turn us into something beyond human lead us to? As seen throughout this chapter, some authors, such as Gardner and Chardin - to name only but two – assume everything marches toward the creation of a super-mind. Although

differences exist[111] in respect with this process, converging aspects may be spotted: the divine realisation that is actualised within the framework of immanence, stemming from matter; optimism based on the belief that such realisation is inescapable, especially considering Lewis's perspective of the infinite worlds where anything that could shall be. In light of such guarantees, what else is there besides the blind faith that there is nothing we need to do? Either we are bound to Chardin's omega point or we remain at peace before the belief that any incidental existing misery in this reality is of little importance since this is just one more world out of infinite other universes where potency is realised in every way it can. It matters not whether we toss a die and obtain "1" as a result for, in some other universe, the numbers are bound to be different. Before this speculation, why would anyone fight for anything at all?

It is not unusual for transhumanists to adopt outlooks of different levels of optimism when faced with the perspective of technological singularity, which is the event that marks the emergence of an artificial super-intelligence capable of self-enhancement. Its implications to society encompass a number of scenarios that tend to be generally optimistic, envisioning our overcoming of aging, of diseases, the achievement of indefinite longevity and even the surge of super abilities. But where is this all heading? To many transhumanists, there is a final cause and it is the transformation of the universe where we find ourselves into a living entity capable of reproducing and generating baby-universes in an infinite process of constant recreation. By way of illustration, here is Gardner's wager, outlining what *our fate is to be very clearly*:

> **We and other living creatures throughout the cosmos are part of a vast, still undiscovered transterrestrial community of lives and intelligences spread across billions of galaxies and countless parsecs who are collectively engaged in a portentous mission of truly cosmic importance. Under the Biocosm vision, we share a common fate with that community – to help shape the future of the universe and transform it from a collection of lifeless atoms into a vast, transcendent mind (GARDNER *apud* KURZWEIL: 2005: p. 361-362).**

Under this transhumanist perspective, human enhancement does not aim to cater to our vanities nor to the mere desire for power or fear of death. Instead, it is, in fact, a strategy of intelligence whose innate traits drive us to: (1) have the impulse of surviving for as long as we can, averting the Jonasian *summum malum*; (2) have the

[111] To Chardin, this is the *Ouroboros*: to reach the omega, which in its turn returns to the alpha; to Gardner, it means the birth of a divine super-mind.

impulse to spread. Let us consider what Kurzweil [112] - to whom intelligence constitutes the most powerful force in the universe, capable of overcoming the final entropy and in this way going after its own survival - has to say:

> **How relevant is intelligence to the universe? (…) The common wisdom is *not very*. Stars are born and die; galaxies go through their cycles of creation and destruction; the universe itself was born in a big bang and will end with a crunch or a whimper, we're not yet sure which. But intelligence has little to do with it. Intelligence is just a bit of froth, and ebullition of little creatures darting in and out of inexorable universal forces. The mindless mechanism of the universe is winding up or down to a distant future, and there's nothing intelligence can do about it. That's the common wisdom. But I don't agree with it. My conjecture is the intelligence will ultimately prove more powerful than these big impersonal forces (…) So will the universe end in a big crunch, or in an infinite expansion of dead stars, or in some other manner? In my view, the primary issue is not the mass of the universe, or the possible existence of antigravity, or of Einstein's so-called cosmological constant. Rather, the fate of the universe is a decision yet to be made, one which will intelligently consider when the time is right (KURZWEIL: 1999: p. 258-260).**

The emergence of the cosmic mind would thus be driven by the same imperative of any other life: surviving for as long as possible. To our universe, that would mean to reproduce through black holes. Further according to Kurzweil:

> **Leonard Susskind, the discoverer of string theory, and Lee Smolin, a theoretical physicist and expect on quantum gravity, have suggested that universes give rise to other universes in a natural, evolutionary process that gradually refines the natural constants. In other words it is not by accident that the rules and constants of our universe are ideal for evolving intelligent life but rather that they themselves evolved to be that way. In Smolin's theory the mechanism that gives rise to new universes is the creation of black holes, so those universes best able to produce black holes are the ones that are most likely to reproduce. According to Smolin a universe best able to create increasing complexity – that is, biological life – is also most likely to create new universe-generating black holes. As he explains, "Reproduction through black holes leads to a multiverse in which the conditions for life are common – essentially because some of the conditions life requires, such as plentiful carbon, also boost the formation of stars massive enough to become black holes". Susskind's proposal differs in detail from Smolin's but is also based on black holes, as well as the nature of "inflation", the force that caused the very early universe to expand rapidly (KURZWEIL: 2005: p. 360).**

It would thus be plausible to state that our universe derives from a previous universe, an intelligent one, which reproduced generating a baby-universe of physical constants that favour the emergence of life and consciousness. Such intelligence gives birth to our universe and, according to Deutsch, possibly to countless others at the same time in random, Darwinist processes that shall culminate in the emergence

[112] Raymond Kurzweil (Born in 1948), American inventor, transhumanist, and futurist.

of life in some universes, in the surge of consciousness in many of them and perhaps converting into super-minds with the capacity to reproduce in some of them. Still in keeping with this hypothesis, in many universes, nothing happens. The key here is to understand that, contrary to Chardin's wager and Lewis's hypothesis wherein anything that can be shall effectively come into being, there is no guarantee of success. Nonetheless, considering our own biophilic universe exists, one could bet on the existence of a previous generating super-mind. Success was actualised and now attempts to repeat itself through us. Such perspective revisits Anselm's ontological argument and explains that perhaps the innate idea of God derives from the fact that we have actually been created by a pre-existing intelligence. Contemplating the plausibility of this proposition, however, does not mean one has to believe that said intelligence possesses anthropomorphic attributes nor that it answers to our prayers let alone that it is kind or moral in the sense human religions would have it. In reality, the wager of this thesis is in consonance with the cosmogonic supposition sustained by Jonas: If there has ever been a God, He outstripped himself of His potency so that the universe could exist, *or* He kept His divine qualities but is unable to intervene. Hence that which has been described here as a reverse Pascal's wager: we are not the ones who have to bet on God's existence rather, it is God who effectively bets it all on us. According to Jonas:

> **As our first proposition we say that the self-divesting of mind at the beginning was more serious than the cheerful prophet of reason was willing to admit. He abandoned Himself and His destiny entirely to the outwardly exploding universe and thus to the pure chance of *possibilities* contained in it under the conditions of space and time. Why He did this remains unknowable. We are allowed to speculate that it happened because *only* in the endless play of the finite, and in the inexhaustibility of chance, in the surprises of unplanned, *and* in the distress caused by mortality, can mind experience itself in the variety of its possibilities. For this the deity had to renounce His own power. (…) From all this, the fact follows that the destiny of the divine adventure is placed in our unsteady hands, in this earthly corner of the universe, and that the responsibility for it rests in our own shoulders. So the deity, I imagine, must become anxious about His own cause. There is no doubt that we have the power in our hands to thwart the purpose of creation – and this precisely in its apparent triumph in us – and that we are perhaps energetic in doing so. (…) By the events of Auschwitz and from the rather of safe harbour of not having been there, wherefrom one can easily speculate, I was impelled to the view, which every doctrine of faith would probably find heretical, that it is not God who can help us, but we who must help God (JONAS: 1996: p. 189-191).**

To back his thoughts, Jonas tells us the story of the Dutch Jewish woman Etty Hillesum (1914-1943), who voluntarily reported to a concentration camp in order to

be of help to her people. Hillesum perished, murdered in a gas chamber in Auschwitz. One excerpt of her journal particularly exemplifies Jonas' theological supposition:

> **(…) and if God does not continue to help me, then I must help God (…) I will always endeavour to help God as well as I can (…) I will help you O God, that you do not forsake me, but right from the start I can vouch for nothing. Only this one thing becomes more and more clear to me: that you cannot help us, but that we must help you, and in so doing we ultimately help ourselves. That is the only thing that matters: to save in us, O God, a piece of yourself. Yes, my God, even you in these circumstances seem powerless to change very much (…) I demand no account from you; you will later call us to account. And with almost every heartbeat it becomes clearer to me that you cannot help us, but that we must help you and defend up to the last your dwelling within us (HILLESUM *apud* JONAS: 1996: p. 192).**

This metaphysical wager concludes the suppositions brought forth in this chapter. *If* – let us highlight here the underlying quality of supposition – there is or there has ever been a God, a super-mind or whatever name we wish to call this vast intelligence, He plays a game and bets all his chips on conscious beings that emerge in the biophilic dynamic of the universe. But if on the one hand this is not a God sure of His success as assumed by Chardin – and as well as by Gardner to an extent – on the other, he does not take as many chances as originally conceived by Jonas either, given that the first expansion generated not one but many other universes where the game is also played and the odds are consequently made higher.

This bet on a God who does not provide, who does not offer any guarantees, who voluntarily turns omni(m)potent lays the foundation for a nomothetic ethic and proposition: there is nothing God can do for us. Rather, we are the ones who should help God. Many are the metaphysical objections against Jonas' cosmogonical supposition regarding a God who would have voluntarily abdicated His omnipotence so that the universe could come into existence. Does it make sense that a God has been suffering since the beginning of the universe, sacrificing Himself driven by inscrutable reasons? A God who starts playing a game with unpredictable results and who could thus not be deemed omniscient either? Could we call Him "God" when He bears such imperfection? These queries would make for an entire thesis on metaphysics imbued with good counter-arguments made by different philosophers aplenty. That is not, however, the object of this thesis, especially considering there is nothing to indicate Jonas intended to effectively put forth any form of metaphysical consolation, rather, we find the proposition of an ethic system to serve as a guide for

the whole of humankind to take responsibility for the course of its actions.

It is possible to contend that which we call “evil” exists solely as a result of our own cognitive limitations before the grand plans of this deity. In spite of this, one must concede that such an argument demands faith or at least some considerable degree of optimism when faced with a hecatomb of the likes of Auschwitz. It is also possible to contend that God does not even exist except as a myth of comforting effect, a metaphysical wishful thinking. In the first scenario, there is the risk of a dangerous resignation. After all, why would anyone fight and what for, if everything that happens is in accordance with divine plans? In the latter, there is the risk of Nihilism. Could there be any alternative to these extremes?

Jonas presents us with a third way: one in which a God abdicates His power. He existed. However, He played a role in the creation and nothing more. A distinct cosmogonical supposition - though partly grounded on Jonas’ hypotheses – is offered here. This is not a God who suffers, but one who plays and takes part in the game in the shape of consciousness with the intent to experience whatever may be possible. As pointed out by Hawking[113], despite Einstein having said on a particular occasion: “God does not play dice with the universe”, the physical evidence points to the exact opposite: if there is a God, He is a great gambler and the universe - or multiverse - is like a giant casino wherein the dice roll and the roulette spins at all times (HAWKING: 2018: p. 75). Furthermore, if we regard Jonas’ cosmogonical supposition as valid and apply Deutsch’s interpretation of the many worlds to it, we are bound to conclude that not only God does play, but he also does so in countless scenarios (alternative universes), thus enhancing His chances of success. One must note that raising the odds is not akin to assuring success. Should we toss a die in a trillion alternative scenarios, we are highly likely to obtain every number possible as a result. Notwithstanding said results are not guaranteed. There is no logical hindrance to the possibility that the die will always show “1” in a trillion universes (minimum figure established by Deutsch), or even in infinite ones (as postulated by Lewis).

[113] Stephen William Hawking (1942-2018), English cosmologist, and theoretical physicist.

3. Conclusions.

Then he (the Starchid) waited, marshalling his thoughts and brooding over his still untested powers. For though he was master of the world, he was not quite sure what to do next. But he would think of something.[114]

Although Hans Jonas has correctly revised the Hobbesian concept of *summum malum* by presenting it as "the extinction of species", he remains bound to a geocentric perspective regarding life, and establishes the Earth as the "final destination of humankind", which constitutes a contradiction in itself. Scientific evidence obtained at the end of the twentieth century demonstrates that our world is subject to mass extinction cosmic events, therefore any conception of planet Earth as a place in which we must be restrict is unacceptable. Such a thought only aggravates the risk of extinction, which is the supreme evil to be avoided. Proposed by Jonas, the *heuristic of fear* is reasonable, and the regulation of human technological development is of fundamental importance. However, the risks posed by technology constitute a set of probabilities that are less dangerous in comparison to the certainty of destruction posed by random cosmic events. A responsible use of technology does not cancel risks totally, but improves our chance of survival beyond planetary borders.

In order to survive on a long-term basis, humankind must understand the Earth not as our *final destiny* as sustained by Jonas, but as our *starting point* from which a biosphere expanded beyond planetary boundaries might be created. In contrast to Christian ethics, which is guided by hope, transhumanistic ethics is here defined as an *ethical desperation*, given that it is necessary to act in order to create the Earthly Paradise rather than wait for a possible but improbable godlike grace.

The sense of *responsibility*, as evoked by Julian Huxley, demands no faith nor hope, but an anticipated action that takes into account we humans are not endowed with more privileges, but with more duties, not only among us, but also among our species and the others. Moreover, transhumanist ethics does not regard the present human form as the ultimate form awareness can assume. In order to survive beyond Earth limitations, humankind (at least a part of it) needs to become *other being*. It is ethically imperative that the human species survive the end of the world, and in order

[114] CLARKE, A. *2001 - A Space Odyssey*.

to do so, it must become transhuman. We must survive not because *human form* has intrinsic value, but because our consciousness has intrinsic value, and thanks to our intelligence, we are capable of defending life and spread it around the cosmos.

It is also possible to sustain the importance of our survival under a metaphysical perspective (which implies a wager). As Jonas highlights, in the very end even if there is a God, His omnipotence was voluntarily sacrificed. Conversely to Pascal's wager, it is God that bets on us, and according to the many worlds interpretation, such a wager happens within uncountable alternative universes. Thus it is our moral obligation to act in order to spread life across the universe, and to favour the emergence of the cosmic awareness.

Considerações Iniciais

Tis true without lying, certain and most true.
That which is below is like that which is above,
And that which is above is like that which is below,
To do the miracles of one only thing (…)[115]

A ontologia do tipo humano é também uma ontologia dos céus, e o vínculo que as une é de tal forma indissociável que a alteração em uma incorre na profunda transformação da outra, em mútuo reflexo.

A presente tese, sob diversos ângulos, constitui um desenvolvimento das pesquisas sobre ética que iniciei por ocasião de meu mestrado. Antes de defender a tese propriamente dita, considero necessário realizar um rápido resumo sobre a dissertação que a precede, de modo a deixar claro de onde parto e aonde pretendo chegar.

Na dissertação[116] realizada no âmbito da Universidade de São Paulo, no Brasil, procurei demonstrar que a mudança de paradigma cosmológico ocorrida entre os séculos XVI e XVII foi em grande parte responsável pelas transformações epistêmicas descritas pelo filósofo francês Michel Foucault (1926-1984) em *Les Mots et Les Choses* (1966). Nesse livro, Foucault se pergunta sobre o que justificaria a mudança epistemológica radical ocorrida no Ocidente, e mantém a pergunta em aberto. Procurei, pois, responder a tal questão, considerando o que se segue:

A epistemologia antiga deriva de uma cosmologia aristotélica e ptolomaica que divide o cosmo em dois mundos: o *sublunar*, lugar do devir e, portanto, da matéria corruptível; e o *supralunar*, caracterizado por sua imutabilidade e composição eterna, sem começo e nem fim. A arquitetura de um céu astrológico garantia, assim, uma existência de sentidos que não apenas antecediam o homem, mas que se revelavam na disposição dos astros na esfera celeste. O mundo, lugar do devir, era compreendido como o resultado de uma vontade divina que a tudo criou de modo perfeito e belo, e as interpretações simbólicas das posições astrais traduziam os desígnios da inteligência ordenadora[117]. Vislumbrar o céu constelado era, portanto, contemplar sentidos apriorísticos. Esta relação entre humanidade e

[115] Hermes Trismegistus, *Tábua Esmeralda.* Traduzido do original em latim por Isaac Newton.
[116] DODSWORTH-MAGNAVITA, Alexey. *Do Céu aos Genes*. USP, 2013. Disponível em: http://www.teses.usp.br/teses/disponiveis/8/8133/tde-29012014-105129/pt-br.php. Acessado em 18 de dezembro de 2016.
[117] Como sustentado por Julius Firmicus Maternus (306-307), em *Matheseos Libri VIII.*

céu constituía a base da ética cristã da resignação e da tolerância, sobretudo nos primeiros cinco séculos do cristianismo. Mesmo as coisas ditas “monstruosas” eram entendidas como parte da norma celeste.

Essa ética se modifica de forma drástica entre os séculos XVI e XVII, e, conforme sustento na dissertação, isso se dá graças à revolução cosmológica protagonizada por Copérnico, Kepler e principalmente por Galileu. Os corpos celestes, antes tidos como “esferas de éter”, se desvelaram em todo o seu inesperado devir, em toda a banalidade de sua matéria: a Lua, com crateras e montanhas mais íngremes que as terrestres; o planeta Júpiter, orbitado por outras luas. Ao ser demonstrado que as esferas celestes eram tão irregulares e sujeitas ao devir quanto o nosso próprio mundo, a harmonia macrocósmica do céu astrológico (ordenado, harmônico, eterno) foi substituída por um céu sem sentidos apriorísticos: um cosmo astrofísico (imperfeito, irregular, ameaçador).

À medida que o conhecimento astrofísico se desenvolveu, mudou-se o sentido do espanto (*thaumázein*), ponto de partida de toda a filosofia. Ao espanto maravilhado diante da beleza dos astros acima de nós, seguiu-se o assombro terrificado. Deparamo-nos com um céu que não apenas não é mais garantia de eternidade, como também nos ameaça com seus bólidos celestes, explosões de raios gama e outros fenômenos de extinção em massa.

É esta mudança de perspectiva em relação ao céu que fez surgir a figura do *anormal*, termo inexistente em tempos antigos e, portanto, inaplicável. A expressão “normal”, por sua vez, era utilizada unicamente em seu sentido geométrico: uma reta vertical que encontra perpendicularmente uma reta horizontal, símbolo da vontade divina (reta vertical) que impõe seus desígnios ao mundo do devir (reta horizontal). Conforme procurei demonstrar na dissertação de mestrado, a expressão “anomalia” foi pela primeira vez usada para se referir a aberrações da posição do planeta Marte, pois os cálculos então em voga não permitiam identificar a efetiva posição do planeta vermelho. Pois bem, a esta disparidade entre a posição calculada e a posição efetiva do astro foi dado o nome de “anomalia”. Pouco a pouco, a ideia de “anomalia” invadiu a esfera da biologia, da medicina e, no século XIX, da psiquiatria e da psicologia. Surgem, então, os corpos anormais e seres anormais a serem corrigidos, uma vez que não há mais uma harmonia macrocósmica que garanta a existência da *norma*. O entendimento modificado do céu leva a um entendimento modificado do tipo humano. De uma ética da tolerância que declara “isso me parece

estranho, mas, uma vez que existe, é fruto da vontade divina e se justifica por um desígnio celeste", tipicamente cristã antiga, passamos a uma ética da correção que se faz valer através da técnica e declara "isto me parece estranho; de que tecnologias posso dispor para corrigir tal estranheza?".

Se na referida dissertação de mestrado me restringi a descrever o que se passou, na presente tese pretendo discorrer sobre o que se passa e sobre possíveis porvires. Pretendo apresentar a emergência de mais uma transformação ética também derivada da mudança da relação da humanidade com o céu. Se do céu astrológico passamos ao céu astrofísico, desde a segunda metade do século XX iniciamos a adentrar *o paradigma do céu astronáutico*. Mais que isso, as discussões sobre a vida se reconstroem na forma de uma *astrobiologia* que não mais separa o nosso planeta do resto do universo.

Nesta nova relação com os astros, o conhecimento e o poder técnico permitem que a inteligência humana redesenhe a espécie como *transumanidade*. O *homo sapiens* dá lugar ao *homo faber*, cuja técnica lhe permite invadir o mesmo céu, o mesmo espaço que, outrora, revelava-se sagrado e inatingível. As cidades humanas sempre foram caracterizadas como sendo um *topos* no qual o homem se restringe a fim de exercitar o seu bem viver, valendo-se da tecnologia para se proteger das intempéries da natureza. Contudo, o conhecimento e o poder técnico levaram o espaço autocontido das cidades humanas a um processo de expansão irrefreável, de modo que, contemporaneamente, não há lugar que não possa ser por nós ocupado. Pois eis que, despido de sua sacralidade e desvelado como um espaço como qualquer outro, o céu representa também a promessa de uma continuidade da vida em novas formas, e mesmo da modificação do entendimento do próprio significado de "vida" em si.

Tudo considerado, a presente tese é dividida em dois capítulos:

O primeiro capítulo realiza um estudo detalhado deste novo modelo ético baseado no movimento transumanista, modelo que defino como *biocêntrico, mas não geocêntrico,* e batizo de *ética do des-espero*; o segundo capítulo diz respeito a uma hipótese metafísica derivada das suposições cosmogônicas de Jonas a respeito da aposta divina, e esta hipótese serve de base para a proposta ética da presente tese.

Ao longo dos capítulos, busco derivar minhas afirmações especialmente do trabalho do filósofo judeu-alemão Hans Jonas (1903-1993), uma vez que seu legado tem particular valor ético, sobretudo no que concerne a seus apelos à urgência do desenvolvimento de uma nova ética, modelo este que dê conta do advento do transumanismo. De fato, a ética do *des-espero* aqui proposta guarda similitude com a *heurística do medo* proposta por Jonas, mas, ressalto, não se trata de uma concordância plena com as ideias do filósofo. Conforme procurarei demonstrar, há alguns elementos fundamentais que, se conhecidos ou considerados por Jonas, talvez o conduzissem a outras conclusões.

A presente tese, portanto, se baseia no trabalho de Jonas, ainda que discordando do filósofo em alguns pontos, como forma de oferecer algo de original. O que é, aliás, a proposta de uma tese de doutorado: não repetir o que alguém já disse com outras palavras, mas buscar ampliar o conhecimento já existente. E permitir, assim, que as futuras gerações possam fazer o mesmo, sentindo-se livres para também refutar ou ampliar as dimensões de tudo o que aqui encontrarem.

1. O imperativo da expansão biocósmica: uma proposta ética.

1.1. Os transumanistas contra o *summum malum* Jonasiano.

A principal defesa desta tese está afinada com o primeiro tópico da *Declaração Transumanista*[118], que dentre vários pontos defende a expansão humana rumo ao espaço exterior, e o espalhamento da vida para além dos limites planetários. Conforme o tópico:

> **(…) We envision the possibility of broadening human potential by overcoming aging, cognitive shortcomings, involuntary suffering, and our confinement to planet Earth[119] (VITA-MORE et al: 2013: pg. 54).**

Uma humanidade pós-terrestre (ou transumanidade) é aqui defendida como capaz de lidar com o conceito de *summum malum* conforme a perspectiva de Hans Jonas: a extinção da espécie humana é o mal supremo a ser evitado (JONAS: 2015: pg. 83-88). A perspectiva jonasiana é consideravelmente ampliada em relação à de Hobbes[120], que por sua vez define: *o mal supremo a ser evitado é a morte violenta*[121].

É possível sustentar que a restrição do *summum malum* hobbesiano à morte violenta do indivíduo decorre do fato de que, durante a vida deste filósofo, o conceito de "extinção das espécies" praticamente inexistia. Mesmo a versão religiosa de catastrofismo vigente na época de Hobbes – o dilúvio de Noé – não se referia a espécies extintas, mas tão somente a indivíduos (animais humanos e não-humanos) que sucumbiram às águas, e a humanidade estava longe de saber o que era um dinossauro. É compreensível, portanto, que Hobbes não tenha imaginado algo pior do que a morte violenta do indivíduo.

A presente tese defende a premência de uma nova ética que leve em conta ações capazes de evitar o *summum malum* jonasiano. Trata-se de uma ética pautada em motivação generosa não-recíproca, pois que considera as gerações futuras mais até do que o nosso próprio bem estar (JONAS: 2015: pg. 72-73). Se as

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[118] A atual *Declaração Transumanista* consiste de uma série de oito tópicos. Foi originalmente redigida em 1998, e tem sido modificada por vários autores ao longo dos anos.
[119] Sublinhado meu.
[120] Thomas Hobbes of Malmesbury (1588-1679), English philosopher.
[121] Tradução livre do original em latim: *Mortem violentam tanquam summum malum studet evitare*. HOBBES. *De Homine*, chap. 11, art. 6.

preocupações e soluções aqui apresentadas soarem como ficção científica, é porque esta tese considera as próprias sugestões de Jonas acerca da importância de levarmos a sério as especulações ficcionais (JONAS: 2015: pg. 74).

Entretanto, apesar de a presente tese estar de acordo com o conceito jonasiano de *summum malum* e considere a morte violenta individual como um *minus malum*, nossa discordância fundamental se pauta no que Jonas considera como "elemento da aposta no agir". O que aqui se sustenta é a ideia de que o agir ético deve considerar os cenários mais prováveis ao invés do ilimitado universo de conjecturas possíveis. Pois se considerarmos a vastidão do conjunto de riscos possíveis, optaremos pelo não-agir, sendo que a extinção da espécie é o *summum malum* que se apresenta não como mera hipótese ligada a um "se", mas como certeza relacionada a um "quando", devido à nossa restrição ao planeta Terra.

É, contudo, compreensível que a proposta jonasiana de uma heurística do medo se restrinja ao risco de destruição protagonizada por humanos. Observe-se o contexto: a mãe de Jonas morreu nos campos de concentração de Auschwitz e ele testemunhou a tentativa de extermínio do povo judeu; além disso, testemunhou a guerra fria e a ascensão da ameaça nuclear. Se o *summum malum* jonasiano supera o hobbesiano, é porque na época de Hobbes era inconcebível que um governante, por mais insano que fosse, seria capaz de exterminar uma etnia inteira, a humanidade ou outras espécies. Entretanto, do mesmo modo que o *summum malum* hobbesiano parece se limitar ao desconhecimento do filósofo a respeito da extinção das espécies, a versão jonasiana também parece estar limitada ao *paradigma uniformitarianista*.

Ao longo do século XIX, o uniformitarianismo - conforme defendido por Lyell[122] - assumiu a posição de doutrina dominante que explicava as transformações geológicas terrestres, oferecendo contraponto à crença religiosa em um catastrofismo diluviano. Em linhas gerais, o uniformitarianismo defendia que as mudanças na superfície planetária decorriam de processos graduais cujos agentes eram banais, tais quais a chuva, a neve, a erosão causada pelos ventos etc. Com base em seus estudos geológicos, Lyell concluiu que não havia fundamento para qualquer crença no desenvolvimento sucessivo de plantas ou animais. Todos os seres teriam existido em todas as eras terrestres, e, se alguns se extinguiram, isso

[122] Charles Lyell (1797-1875), geólogo escocês.

teria se dado através de processos vagarosos, como, por exemplo, a escassez de alimentos (LYELL: 1990: pg. 123). Em sua época, o uniformitarianismo afetou profundamente o trabalho de Darwin[123], fazendo-o concluir que qualquer extinção se daria em um ritmo bastante lento, na verdade mais lento ainda do que o surgimento de uma espécie nova (DARWIN: 1964: pg. 84). É verdade que Darwin contradizia Lyell ao apontar para o surgimento de espécies novas por conta da evolução, mas, ainda assim, ambos concordavam que o fenômeno da extinção se explicava por processos graduais, relacionados à carência de recursos, à limitação geográfica e consequente redução do número de indivíduos. Os sucessores de Darwin e Lyell se mantiveram fiéis à ideia uniformitarianista de extinção lenta, mesmo no que dizia respeito aos dinossauros e a outros animais pré-históricos, de modo que a ciência adentrou o século XX concebendo apenas um agente capaz de causar extinção abrupta: o tipo humano.

Foi tão somente no fim da década de 70 do século XX que a humanidade foi apresentada à existência de eventos de extinção global causados por forças extraterrestres. Tal conhecimento se deu quando, nos arredores da cidade italiana de Gubbio, em um lugar conhecido como Gola del Bottaccione, Walter Alvarez[124] observou quão abrupto parecia ser o desaparecimento das espécies de foraminíferos por conta da disposição dos fósseis nas rochas. Foi Luís Alvarez[125] (pai de Walter), quem propôs avaliar a idade da argila de Gubbio, e terminou constatando extraordinária quantidade de irídio nas amostras (ALVAREZ: 2000: pg. 69). Ocorre que o irídio é um elemento de grande raridade na superfície terrestre, mas abundante em meteoritos. Cientes de estarem diante de uma anomalia, os Alvarez decidiram analisar a terra de outros sítios geológicos onde as espécies pareciam ter desaparecido subitamente, e constataram a mesma presença anômala de irídio. Foi em junho de 1980 que o artigo dos Alvarez, intitulado *Extraterrestrial Cause for the Cretaceous Tertiary Extinction*, foi publicado na revista *Science*. O impacto desta publicação rapidamente ultrapassou o âmbito da geologia, repercutindo positivamente em outros saberes, como a astrofísica [126], mas encontrando resistência ferrenha em vários cientistas da época, conforme pode ser

[123] Charles Darwin (1809-1882), naturalista inglês, biólogo e geólogo.
[124] Walter Alvarez (nascimento: 1940), geólogo norte-americano.
[125] Luís Walter Alvarez (1911-1988), físico norte-americano, Nobel em física (1968).
[126] Inspirado pelo artigo dos Alvarez, o astrofísico americano Carl Sagan (1934-1996) comandou uma equipe para modelar efeitos de uma guerra nuclear, e chegou ao conceito de “inverno nuclear”.

averiguado em um artigo intitulado: *Miscasting the Dinosaur's Horoscope*[127]. Esta e outras manifestações midiáticas da época, como *Dinosaur Expert Resist Meteor Extinction Idea*[128] demonstram bem o quanto a ciência ainda era fiel ao paradigma uniformitarianista de Lyell. Um paradigma que excluía qualquer mudança repentina, mesmo diante de evidências. Ressalte-se que o próprio Lyell estava perfeitamente ciente das rupturas súbitas nos registros fósseis. Em seu *Principles of Geology*, Lyell aponta uma lacuna abrupta entre fósseis encontrados em rochas do final do cretáceo e do início do paleogeno. Segundo Lyell, era *impossível e não filosófico* supor que essa quebra abrupta representasse de fato uma mudança repentina na ordem das coisas, e tal lacuna se daria provavelmente por uma falha no registro fóssil (LYELL: 1990: pg. 328, v. 3). Darwin também estava muito bem informado a respeito da súbita quebra fóssil no fim do cretáceo, e, assim como Lyell, atribuiu isso a uma imperfeição dos registros, interpretação que pode ser verificada ao longo de seu *A Origem das Espécies.*

Entretanto, se a ciência já superou o paradigma uniformitarianista e hoje compreende a história da Terra como um misto de uniformitarianismo e neocatastrofismo, a bioética continua predominantemente restrita a uma preocupação referente aos perigos da ação tecnológica humana, e não dá a devida importância ao fato de que a extinção não é uma anomalia introduzida pela inteligência humana, mas faz parte do curso errático da própria natureza. A despeito de a presente tese concordar com Jonas no que tange à sua definição de *summum malum*, a discordância reside nas recomendações procedimentais. Jonas está principalmente preocupado com os perigos da ação tecnológica, e, embora tenha razão em sua cautela, trata-se de uma preocupação limitada ao contexto de sua época. *O Princípio Responsabilidade* é uma obra de 1979, publicada um ano antes do artigo dos Alvarez, cujo impacto levou quase uma década para ser absorvido pela maioria da comunidade científica.

Por ter sido uma da mais poderosas vozes do século XX a denunciar o alto risco de desastre inerente ao progresso técnico desenfreado, Jonas foi um pioneiro. Seu receio em relação à tecnologia é muito bem justificado pelo fato de que, no passado, o agir humano não precisava se conter em razão de especulações sobre o possível. Quaisquer erros procedimentais de nossos ancestrais acarretavam

[127] *The New York Times*. 2 de abril de 1985.
[128] *The New York Times*. 29 de outubro de 1985.

consequências reversíveis ou, pelo menos, danosas em contextos espaço-temporais bastante restritos. Tal não se dá com o nosso agir tecnologicamente empoderado, cujos erros põem em risco não uma cidade, mas a própria existência da humanidade. E é fato que, dentre a vastidão de cenários possíveis, a extinção pode ser desencadeada pelo avanço tecnológico. Mas este é um dos cenários disponíveis dentro do conjunto de possibilidades cujas probabilidades podem ser reduzidas por um pacto ético. Conforme Jonas,

> **This reservation - that only the avoidance of the highest evil and not the pursuit of the highest good justifies, under certain special circumstances, that the interest of "others" is put at risk in its totality, for their own sake – does not offer support to justify the high stakes of technology. For these are not undertaken to preserve what exists or to alleviate what is unbearable, but rather to continually improve what has already been achieved, in other words, for *progress*, which at its most ambitious aims at bringing about an earthly paradise. It and its works stand therefore under the aegis of arrogance rather than of necessity (JONAS: 2015: pg. 85).**

Não se nega, aqui, que Jonas tenha razão ao acusar o progresso tecnológico como sendo mais lastreado pela vaidade do que pela necessidade. Sem este avanço tecnológico, entretanto, o cenário de extinção escala da categoria contingencial para a apodítica. Observe-se que, no excerto precedente, Jonas dá a entender que os riscos valeriam a pena se tivessem por objetivo "salvar o que existe" (no caso, a humanidade e outros seres sencientes) ou "abolir o insuportável" (o *summum malum* jonasiano: a extinção coletiva).

Ora, mas sem o desenvolvimento tecnológico o fator "extinção" não se configura como mera possibilidade. Constitui certeza. O próprio Jonas demonstra ter plena ciência da caducidade planetária em obra[129] escrita em 1988, ao se referir ao fim da Terra em decorrência de fenômenos cósmicos naturais: o fim das revoluções terrestres, quedas de meteoros, a morte do sol, etc. Curiosamente, ao se referir a tais fatos cujo grau de certeza é indubitável (e que incorrerão na extinção total), Jonas parece não aplicar sua defesa a uma *obrigação incondicional de existir* (JONAS: 2015: pg. 86), nem classifica como insuportável a extinção da espécie humana. Ele diz, sobre as catástrofes cósmicas, que

[129] *Materia, Spirito e Creazione*. Morcellana: 2012. Traduzido do alemão para o italiano por Paolo Becchi e Roberto Franzini Tibaldeo. Traduzido do italiano para o português por mim.

> **We should not be terrified by this cosmic expiration: in this interval which has been conquered - for us of long duration - characterized by great articulations from the very wide extent, the *chances* lie precisely in what for us, and probably also for a divine observer, constitutes the meaning of all the cosmic adventure (JONAS: 2012: 35).**

Oito anos separam *Das Prinzip Verantwortung* de *Materie, Geist und Schöpfung*. Jonas não demonstra considerar a extinção humana por catástrofes cósmicas como algo a ser temido em nenhuma das duas obras, não obstante tal extinção, conforme já dito, não faça parte do contingente de meras possibilidades, e constitua plena certeza. É neste específico ponto que a presente tese se distancia de Jonas: não obstante a ética jonasiana não seja antropocêntrica e atribua valor intrínseco não apenas ao homem, mas à vida, tal ética não concebe a expansão astronáutica da existência, nem a dimensão astrobiológica da vida. Jonas não define suas ideias como antropocêntricas, mas elas são ecocêntricas, ou mesmo biogeocentradas: vida e planeta Terra como elementos indissociáveis. Conforme Jonas, acerca do contato com criaturas extraterrestres inteligentes,

> **Sabemos apenas isto: que com nós e em nós, nesta porção de universo e neste momento do nosso fatal poder, a causa de Deus oscila sobre a balança. Que importa se em outro lugar essa causa prospera, foi colocada em perigo, salva ou desperdiçada? Temos já até então muito a se fazer para que *o nosso* sinal que um tempo se acendeu em algum canto do universo não seja um anúncio de morte. Ocupemo-nos da nossa Terra. O que quer que exista além dela, aqui reside o nosso destino[130]; com isso, a quota de risco da criação, que é conectada a este lugar, terminou em nossas mãos e pode ser bem cuidado ou traído. Cuidemos de nós, como se de fato fôssemos únicos no universo (JONAS: 2012: pg. 101).**

Observe-se que, levando em conta o excerto anterior, Jonas nos conclama a cuidar de nosso próprio mundo de forma a impedir que *nosso sinal (...) não seja um anúncio de morte*. Sobre como poderemos evitar nossa própria extinção, dado que a existência da vida se encontra até o momento vinculada à Terra, Jonas nada diz. É possível até mesmo interpretar, a partir do texto, que tal extinção não deveria ser evitada, uma vez que, conforme diz o filósofo, *aqui reside o nosso destino*. Ora, a Terra não é eterna e nem mesmo imune a interferências cósmicas. Conectar o destino da humanidade ao nosso planeta significa aceitar sua indubitável extinção futura, o que é contraditório com o que o próprio Jonas prega ao se referir a uma *obrigação incondicional de existir, por parte da humanidade, que não pode ser*

[130] Sublinhado por mim.

confundida com a obrigação condicional de existir, por parte de cada indivíduo (JONAS: 2015: pg. 86).

Se o *summum malum* sob uma perspectiva jonasiana é a extinção da humanidade, não faz o menor sentido definir a Terra como residência de nosso destino. Dado que nosso mundo tem um prazo de validade que independe do agir humano, a única possibilidade de evitar o *summum malum* é através de ações tecnológicas que visem expandir a humanidade e outras formas de vida para além dos limites terrestres e para além de sua própria forma, que é o que esta tese defende como sendo *a dimensão astronáutica da existência*.

Jonas realizou um grande e necessário passo, ao chamar a atenção para a importância de uma ética não-antropocêntrica. É preciso, contudo, dar um passo adiante de modo a realizar uma *revolução copernicana da ética*, na qual a Terra é origem e merece cuidados, mas não é nem centro e nem destino final, mas ponto de partida. As chances de evitar o *summum malum* serão maiores à medida que nos espalharmos pela galáxia e cumprirmos nosso potencial como *distribuidores da dádiva da vida*. Nenhuma outra espécie conhecida é dotada do conhecimento e do poder capaz de realizar este ato de - para nos valermos de uma expressão jonasiana - generosidade não-recíproca.

É preciso, portanto, dar um salto para além das preocupações de Jonas. Não é apenas com a ação tecnológica humana que precisamos nos preocupar, mas também com a sua inação injustificada, levando em conta o nosso atual conhecimento científico. Trata-se de uma inação imoral, que põe em risco não só a humanidade, como toda a vida na Terra.

O empreendimento expansionista transumano aqui proposto em nada se assemelha aos propósitos da primeira corrida espacial que, por ocasião da guerra fria, fundavam-se em competição e vaidade. É uma questão sobretudo de sobrevivência, e sua primeira política deveria ser o estabelecimento de um programa espacial de defesa da Terra contra catástrofes cósmicas. Ainda que a ficção científica não tenha a intenção de adivinhar o futuro, há nela uma verdade mais poderosa que a realidade.

Por exemplo: *Encontro com Rama*, de Clarke[131], nos adverte seriamente a respeito de tudo isto. A história começa com uma excelente crítica moral acerca de

[131] Arthur C. Clarke (1917-2008), cientista britânico e escritor de ficção científica.

nossa tendência a agir apena quando é tarde demais. Clarke inicia a história descrevendo alguns eventos cósmicos reais que aconteceram em nosso passado recente. Ao relembrar a queda de um meteorito em Tunguska em 30 de junho de 1908, ele enfatiza quão vulneráveis nós estamos, dado que *Moscou escapou da destruição por três horas e quatro mil quilômetros – margem mínima pelos padrões do universo* (CLARKE: 2011: pg. 7). Ele também relembra o meteorito de Sikhote-Alin que caiu em Vladivostok em 1947, *com uma explosão equivalente à da recém-inventada bomba de urânio* (CLARKE: 2011: pg. 7). Está bastante claro que nós estamos à mercê de eventos cósmicos aleatórios. Nós só não tomamos medidas sérias no que diz respeito a um programa de defesa planetária espacial porque não fomos ainda golpeados de uma forma que realmente nos machuque. Assim, de modo a demonstrar quão randômico e indiferente o universo é, Clarke nos oferece um cenário ficcional drástico no qual o nordeste da Itália é totalmente destruído por milhares de toneladas de rocha e metal caindo do céu. Ele escreve:

> **As cidades de Pádua e Verona foram varridas da face da Terra; e os últimos esplendores de Veneza afundaram para sempre sob o mar, quando as águas do Adriático trovejaram em direção à terra firme, após a martelada do espaço. Seiscentas mil pessoas morreram, e os danos totais somaram mais de um trilhão de dólares. Mas a perda para a arte, a história, a ciência – para toda a humanidade, até o fim dos tempos – foi incalculável (CLARKE: 2011: pg. 8).**

Graças ao trauma, a humanidade reage declarando que não haverá próxima vez, e então cria um projeto de defesa contra ameaças espaciais. A advertência de Clarke é bastante clara desde o início de seu livro: *Mais cedo ou mais tarde, iria acontecer* (CLARKE: 2011: pg. 8). Teria sido melhor agir em antecipação, do que meramente reagir.

Ainda que a ética ambiental esteja sendo considerada mais e mais seriamente, é ainda pouco usual que filósofos abordem temas que vão além do contexto terrestre. O ato de visualizar a Terra como se ela existisse dentro de uma caixa fechada sem interações com o espaço cósmico é um erro comum. De fato, pessoas tendem a visualizar a si mesmas como vivendo em uma caixa cuja transparência se limita a permitir a entrada e saída de luz e calor. Até agora, as maiores preocupações ambientais de escala cósmica dizem respeito ao problema do lixo espacial orbitando nosso planeta. Mas o planeta Terra não é um sistema fechado. O senso comum tende a ser facilmente ludibriado pela falsa ideia de estabilidade planetária. Conforme dito antes, nosso planeta já sofreu eventos que

causam extinção global, os quais foram desencadeados por fatores extraterrestres que extinguiram mais de 75% das espécies. Não há garantia – e nós não deveríamos agir como se houvesse – que eventos de extinção cósmica não tornarão a ocorrer.

Além disso, a própria ideia de "cosmos", considerando o significado grego do termo que significa "ordem" e "beleza", é um tanto ilusório. De muitas formas, o senso comum ainda vive sob a ideia de uma harmonia macrocósmica aristotélica – a crença confortável em um mundo eterno.

1.2. *Transumanar*: de Dante a Huxley.

Apesar de o transumanismo como um movimento organizado ser recente na história humana, suas propostas mais caras derivam de ideias desenvolvidas por pensadores antigos que podem ser considerados proto-transumanistas. De modo a entender este movimento, é preciso esclarecer que muitas de suas pretensões[132]. guardam forte paralelo com antigas mitopoéticas místicas.

De fato, "transumanismo" é um termo provavelmente usado pela primeira vez por Dante[133] em *A Divina Comédia* de modo a exprimir um tipo de transcendência humana na direção divina. Uma vez que não havia um termo apropriado para expressar sua experiência mística no Paraíso, Dante cunha o neologismo *trasumanar*. Em português, uma tradução aceitável do original dantesco seria: *Transumanização é algo que não pode ser expresso em palavras / mas deixemos que o (prévio) exemplo baste / para aqueles que o experimentarão pela graça (de Deus)*[134].

Dois séculos depois de Dante, Pico della Mirandola[135] é tido como uma referência proto-transumanista da Renascença (MORE: 2013: pg. 9). Em *Oration on the Dignity of Man*, Mirandola reinventa o mito da criação, escrevendo como se os deuses se dirigissem ao homem. Apesar dos aspectos religiosos/mitológicos

[132] Cito as mais recorrentes: imortalidade e paranormalidade; existência com pouco ou nenhum sofrimento; e a que nos interessa sobremaneira na presente tese: a criação de uma "nova Terra" (tanto no sentido de otimização e conservação do nosso mundo quanto da criação de novos mundos habitáveis, sejam eles naturais ou artificiais).
[133] Durante degli Alighieri (1265-1321), better know as Dante Alighieri, Italian poet.
[134] No original italiano: *Trasumanar significa per verba non si poria / però l'essemplo basti a cui esperienza grazia serba*; Paradiso (1).
[135] Giovanni Picolo della Mirandola (1463-1494), filósofo italiano.

presentes no texto, ele expressa uma das ideias transumanísticas centrais, que é a do ser humano como um polimórfico fazedor de si mesmo. Escreve Mirandola:

> **We have given you, oh Adam, no visage proper to yourself, nor any endowment properly your own, in order that whatever place, whatever form, whatever gifts you may, with premeditation, select, these same you may have and possess through your own judgment and decision. The nature of all other creatures is defined and restricted within laws which We have laid down; you, by contrast, impeded by no such restrictions, may, by your own free will, to whose custody We have assigned you, trace for yourself the lineaments of your own nature. I have placed you at the very center of the world, so that from that vantage point you may with greater ease glance round about you on all that the world contains. We have made you a creature neither of heaven nor of earth, neither mortal nor immortal, in order that you may, as the free and proud shaper of your own being, fashion yourself in the form you may prefer. It will be in your power to descend to the lower, brutish forms of life; you will be able, though your own decision, to rise again to the superior orders whose life is divine (MIRANDOLA: 1956: p. 7-8).**

Vale citar outros proto-transumanistas como, por exemplo, Giordano Bruno[136], que pretendeu criar um tipo de técnica meditativa capaz de expandir a memória e a inteligência. Tommaso Campanella[137], por sua vez, advogou em favor de um tipo de eugenia mística em sua obra *The City of The Sun*, onde, por meio de casamentos astrologicamente orientados, seria possível desenvolver seres humanos mais fortes e inteligentes. Alquimistas através dos séculos se engajaram na busca do elixir da longa vida e outras fórmulas capazes de conferir poderes miraculosos aos homens.

Está bastante claro que o que outrora foi imaginado a partir de critérios mágicos, hoje se torna viável através da tecnologia. Fundamental, no que tange a esta ruptura com o pensamento mágico, citar Marquis de Condorcet[138] como um dos primeiros pensadores iluministas a sugerir a possibilidade de um melhoramento humano cientificamente fundamentado e capaz de conduzir o mundo à prosperidade. Conforme Condorcet:

> **In fine, may it not be expected that the human race will be meliorated by new discoveries in the sciences and the arts, as an unavoidable consequence, in the means of individual and general prosperity; by farther progress in the principles of conduct, and in moral practice; and lastly, by the real improvement of our faculties, moral, intellectual and physical, which may be the result either of the improvement of the instruments which increase the power and direct the exercise of those faculties, or of the improvement of our natural organization itself. (…) Would it even be absurd to suppose this quality of melioration in the human species as susceptible of an indefinite advancement; to suppose that a period must one day arrive when death will be nothing more than the effect either of extraordinary accidents, or of the flow and gradual decay of the vital**

[136] Filippo Bruno (1548-1600), mais conhecido como Giordano Bruno, filósofo italiano e monge cristão.
[137] Giovanni Domenico Campanella, (1568-1639), mais conhecido como Tommaso Campanella, foi um filósofo italiano, frade dominicano e astrólogo.
[138] Marie Jean Antoine Nicolas de Caritat (1743-1794), também conhecido como Nicolas de Condorcet, filósofo francês e matemático.

> **powers; and the duration of the middle space, of the interval between the birth od man and his decay, will itself have no assignable limit? (CONDORCET *apud* MORE: 2013: pg. 9-10)**

Desde então, a palavra “transumanismo” assumiu diversos significados cujo ponto comum diz respeito à possibilidade de uma pessoa se tornar mais que humana. Por outro lado, as diferenças entre os significados antigo e contemporâneo são imensas. O *trasumanar* de Dante, por exemplo, é uma dádiva concedida por Deus. Uma graça não apenas espiritual, mas também corpórea que guarda paralelo com o conceito cristão de ressurreição: jamais um pós-vida incorpóreo, dado que o Paraíso Terrestre é erigido em um mundo pós-apocalíptico divinamente criado. De acordo com esta crença, a transformação da carne mortal em um corpo glorioso é uma promessa, e promessas não dependem de nós. O *trasumanar*, tanto cristão quanto o de Dante, é, acima de tudo, fundado em *esperança*. A esperança de ser abençoado e ressuscitado por Deus em novos corpos transumanizados, dentro dos quais nossas almas estarão livres de toda e qualquer fraqueza ou sofrimento.

Outra diferença digna de nota entre o *trasumanar* cristão e o transumanismo contemporâneo concerne à distinção entre *qualidade* e *quantidade*. O transumanismo contemporâneo se dedica a atingir *mais*: mais tempo, mais vida, mais poder, mais prazer, mais lugares aonde ir. O *trasumanar* cristão, por sua vez, ao acreditar na recompensa de uma vida eterna pós-apocalíptica, não se preocupa com a extensão da vida corpórea, mas com a qualidade de sua ainda que curta existência. Esta preocupação com a qualidade exige dedicar a vida às virtudes que garantirão um lugar no Reino de Deus. Note-se que em nenhum dos casos o Paraíso Terrestre é incorpóreo: na perspectiva cristã, há trabalho a fazer no divino reino. Do *trasumanar* de Dante ao transumanismo contemporâneo, a crucial diferença está entre *ter esperança* (de modo a obter uma graça, uma recompensa divina por nossas virtudes/qualidades) e *agir* (de modo a garantir mais tempo e auto-aperfeiçoamento). Se em Dante o *trasumanar* é uma dádiva de Deus, o movimento transumanista atual não está interessando em esperar por uma possibilidade baseada em fé e esperança. Ao invés de esperar por um eventual Paraíso futuro, os transumanistas contemporâneos querem fazê-lo real aqui e agora.

O transumanismo aqui proposto é, portanto, oposto a qualquer garantia fornecida pelo *trasumanar* cristão. O transumanismo cristão é uma garantia apocalíptica, é o paraíso instaurado após a ressurreição dos mortos em novos e

gloriosos corpos. Estende-se no horizonte como promessa vinculada às três virtudes/qualidades teologais: esperança (de um dia alcançarmos o paraíso), fé (na existência do próprio paraíso) e caridade (como condição de entrada no paraíso).

O transumanismo contemporâneo, em contrapartida, não é uma garantia, é um objetivo *desesperado*[139]. Não há paraíso garantido para este universo, embora tal paraíso seja altamente provável em *algum* universo, dado que, conforme se verá no próximo capítulo, a aventura cósmica se dá em múltiplas realidades. É preciso, portanto, lutar para que o nosso universo seja um dos cenários bem sucedidos. Trata-se de um universo favorável à existência da vida, e que tem na emergência da consciência sua maior realização. Deveríamos seguir um imperativo ético: considerar o planeta não como nosso destino, mas como ponto de partida, dado que a mortalidade natural do planeta é um dado concreto[140]. Aumentar as chances da vida e da consciência é mandatório e deveria ser considerado nossa obrigação moral como seres inteligentes que de fato somos.

Neste ponto é válido observar que algumas teses e artigos sobre transumanismo tendem a se voltar para o *summum bonum* como tema principal. Um bom exemplo está disponível no manifesto contra o sofrimento, escrito por David Pearce[141]:

> **This manifesto outlines a strategy to eradicate suffering in all sentient life. The abolitionist project is ambitious, implausible, but technically feasible. It is defended here on ethical utilitarian grounds. Genetic engineering and nanotechnology allow *Homo sapiens* to discard the legacy-wetware of our evolutionary past. Our post-human successors will rewrite the vertebrate genome, redesign the global ecosystem, and abolish suffering throughout the living world. (…) Our descendants may live in a civilisation of serenely well-motivated "high-achievers", animated by gradients of bliss. Their productivity may far eclipse our own[142].**

Embora a abordagem transumanística às vezes possa de fato ser utópica de várias maneiras, a presente tese está concentrada em uma política de redução de danos. Dentre tantas propostas elaboradas pelos transumanistas, todas têm em comum o uso da *techne* como interferência intencional que visa o melhoramento.

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[139] No sentido de: “sentimento de estar em tão má situação que qualquer risco será tomado para mudá-la”.

[140] Pode-se argumentar que a mortalidade do universo também é um dado concreto, mas seria possível criar novos universos, com informação insuflada pela consciência que aqui emergiu (os “universos-bebês” de Gardner, abordados no próximo capítulo), realizando assim um *jogo infinito*.

[141] Filósofo britânico, co-fundador da Associação Mundial de Transumanistas.

[142] PEARCE, D. *The Hedonistic Imperative.* Available at: https://www.hedweb.com/hedab.htm. Accessed on March 14, 2019.

Esta intencionalidade humana que arquiteta, planeja, desenha e executa resultados via tecnologia é preconizada pelos transumanistas como parte do conjunto de coisas *desejáveis*, contanto que tal direcionamento intencional se dê a partir de critérios éticos num sentido não-antropocêntrico. O *ethos* transumanista se baseia na redução de danos e preconiza a diminuição máxima do sofrimento involuntário das criaturas sencientes. Ainda que diferentes grupos[143] organizados que se definem como transumanistas tenham distintas visões políticas, o ponto intersecional entre eles é justamente a redução do sofrimento dos seres sencientes.

O termo "transumanismo" aplicado à ideia da ciência em prol do melhoramento humano tem em Julian Huxley[144] o seu primeiro propositor. Em 1957, Huxley publica seu artigo *Transhumanism*, cuja premissa defende que a inteligência superior humana nos confere não mais direitos, mas mais deveres e responsabilidades para com os outros seres e para com o universo. O texto de Huxley é altamente significativo por ir além de um elogio do melhoramento por mero capricho, soberba ou vaidade, mas por lançar as bases do que se configura como uma *responsabilidade* da qual a inteligência humana não poderia se esquivar:

> **As a result of a thousand million years of evolution, the universe is becoming conscious of itself, able to understand something of its past history and its possible future. This cosmic self-awareness is being realized in one tiny fragment of the universe — in a few of us human beings. Perhaps it has been realized elsewhere too, through the evolution of conscious living creatures on the planets of other stars. But on this our planet, it has never happened before (HUXLEY: 1957: p. 13-17).**

É interessante notar a consideração que Huxley faz a respeito de eventuais inteligências alienígenas. Esse é o cerne do transumanismo: não se trata de um movimento que atribui valor intrínseco à *humanidade*, mas a uma *autoconsciência cósmica*. Essa consciência pode ter se manifestado em outro canto do universo e até pode vir a ser artificialmente criada em nosso próprio mundo. Dito isso, já é possível destacar que o transumanismo, conforme concebido por Huxley e sustentado na presente tese, não é antropocentrista. O valor intrínseco da

[143] Como exemplo de grupos transumanistas organizados, cito o "Humanity Plus" (sítio eletrônico oficial: http://hplusmagazine.com. Acessado em 1 de dezembro de 2018). Há também movimentos políticos organizados, como o "Transhumanist Party" (sítio eletrônico oficial: http://transhumanist-party.org. Acessado em 1 de dezembro de 2018), que em 2016 lançou Zoltan Istvan, que se define como "libertário", candidato à presidência da república nos EUA.

[144] Julian Sorell Huxley (1887-1975), biólogo britânico, primeiro diretor da Organização das Nações Unidas para a Educação, a Ciência e a Cultura (UNESCO).

humanidade não jaz em sua forma, mas em sua *consciência e inteligência*, e, portanto, tal valor poderia se manifestar em quaisquer outras formas. Inclusive em algumas que nós mesmos desenhássemos.

Quando as discussões giram em torno do que tem valor por si mesmo, a tendência é que se foque no quanto o ente dotado de valor intrínseco possui direitos e é mais especial em relação a todos os outros entes cujo valor é apenas instrumental. Para Huxley, contudo, o que se põe como fulcral não são os direitos, e sim a *responsabilidade*, ou seja, *o dever que acompanha a criatura dotada de inteligência*. Mas que responsabilidade seria essa?

À guisa de uma resposta, vale destacar que muito se diz sobre o potencial destrutivo da humanidade, sobre como afetamos o planeta de modo a extinguir espécies inteiras e sobre como estamos alterando drasticamente o clima. Tudo isso é verdade. Entretanto, também é verdade que a regra da natureza é a extinção. Esta mesma natureza, para a qual se atribuiu por diversas vezes ao longo da história a inteligência de um relojoeiro, está mais para um relojoeiro *cego*, e qualquer estabilidade e segurança não passam de uma ilusão decorrente de nosso curto tempo como entes existentes neste mundo.

Teme-se o poder destrutivo da humanidade, mas, muito antes de nosso surgimento, eventos de extinção em massa se deram e em algum momento voltarão a ocorrer. Por mais danosa que seja a intervenção humana no planeta, ela não é capaz de inviabilizar toda a vida, diferente de eventos cósmicos extremos. É questão de tempo até que o sol se extinga, pondo fim à vida do planeta. Com todos os seus defeitos, a espécie humana é a única capaz de, mediante o desenvolvimento tecnológico, proteger a vida – não apenas a da própria espécie - contra a fatal extinção cósmica. Conforme Huxley,

> **The new understanding of the universe has come about through the new knowledge amassed in the last hundred years—by psychologists, biologists, and other scientists, by archaeologists, anthropologists, and historians. It has defined man's responsibility and destiny — to be an agent for the rest of the world in the job of realizing its inherent potentialities as fully as possible. (…) That is his inescapable destiny, and the sooner he realizes it and starts believing in it, the better for all concerned (HUXLEY: 1957: pg. 13-17).**

Eis o ponto fulcral do transumanismo de Huxley, com o qual a presente tese concorda: *seres inteligentes possuem uma responsabilidade e destino para com a natureza e o universo*. Há um teor de não-acidentalidade quando Huxley aponta

essa responsabilidade como um “destino inescapável”. Definir algo como “inescapável” implica afirmar sua não-contingência, o que parece bastante estranho para um biólogo, se considerarmos que, em termos de seleção natural, a existência da humanidade é tão somente uma contingência quanto outra qualquer. Uma contingência passível de ser destruída por um fenômeno cósmico aleatório, como a colisão de um asteroide; ou destruída por si mesma e por seu progresso técnico desenfreado.

Mas é interessante notar que, a despeito de Huxley se referir aos homens, na introdução de seu texto ele considera que a consciência pode ter emergido em outros lugares. A partir do momento em que Huxley defende a consciência como o resultado de uma evolução do universo, é evidente que, dada a vastidão cósmica, tal inteligência emergiu, emerge ou emergirá em qualquer outro canto/tempo. Nosso universo seria, portanto, biofílico, e no segundo capítulo desta tese veremos que há suficientes evidências que tornam tal aposta aceitável.

Se a consciência é um processo evolutivo do universo e ele é tão vasto, ainda que a humanidade não assuma o *destino inescapável de sua responsabilidade*, eventualmente alguma espécie consciente/inteligente o fará. Ainda assim, seria possível contra-argumentar que a visão de Huxley é otimista, dado que, dentro do conjunto limitado e finito (ainda que extremamente vasto) ao qual chamamos “universo”, a emergência da consciência pode muito bem ter se dado única e exclusivamente na Terra. A improbabilidade dessa afirmação não implica impossibilidade. Por que então Huxley aposta em um “destino inescapável” da inteligência?

Na ordem da crença, pode-se dizer que talvez haja um *telos* cósmico que favoreça a emergência da vida. Por outro lado, a emergência da inteligência e da autoconsciência são apostas muito mais altas. Afinal, mesmo que trabalhemos com a ideia de infinito, nem o infinito espacial dos múltiplos universos e nem o temporal constituem garantia de que a inteligência emergirá.

Três questões filosóficas podem ser feitas em torno do excerto de Huxley. A primeira é: *O autor advoga um darwinismo cósmico*? Tudo indica que sim, posto que ele relaciona a emergência da consciência no planeta Terra a um processo evolutivo de milhões de anos e afirma que o mesmo processo pode ter se repetido alhures; Em segundo lugar, podemos nos perguntar: *Huxley defende a existência de um plano cósmico*? A resposta é: provavelmente sim, embora dificilmente em um

sentido teísta. A inteligência/consciência que desponta em nós atuaria como agente para a efetivação dessas *potencialidades inerentes*, note-se, não apenas da humanidade, mas *para todo o resto do mundo*; Decorre-se daí a questão número três: *Que potencialidades seriam essas?*

Pois bem: ao longo de seu artigo, Huxley não responde sobre as potencialidades inerentes *da natureza e da vida* que ele mesmo aponta. Ele diz que nós temos uma responsabilidade para com o universo, mas não diz que responsabilidade seria essa. Huxley se limita a descrever nossa capacidade de auto-aprimoramento através da ciência e da tecnologia, nosso poder de superação do sofrimento desnecessário:

> **Up till now human life has generally been, as Hobbes described it, *nasty, brutish and short*; the great majority of human beings (if they have not already died young) have been afflicted with misery in one form or another—poverty, disease, ill-health, over-work, cruelty, or oppression. They have attempted to lighten their misery by means of their hopes and their ideals. (…) We are already justified in the conviction that human life as we know it in history is a wretched makeshift, rooted in ignorance; and that it could be transcended by a state of existence based on the illumination of knowledge and comprehension, just as our modern control of physical nature based on science transcends the tentative fumbling of our ancestors, that were rooted in superstition and professional secrecy (HUXLEY: 1957: pg. 13-17).**

Huxley parece ter iniciado um argumento poderoso que, todavia, perdeu-se no texto. Ele claramente fala de uma responsabilidade e um destino que a espécie humana teria *para com o resto do mundo*, mas, em seguida, limita-se a discorrer sobre nossa capacidade de superar limitações. Todavia, os transumanistas que vieram em seguida deixaram claro que tal *responsabilidade e destino* é de duas ordens: (1) preservar a vida e consciência, mas não necessariamente a forma antropomórfica através da qual a consciência se manifesta; (2) garantir a proliferação da vida e da consciência através do cosmo.

Huxley conclui o artigo enfatizando outro ponto importante dessa *responsabilidade e destino*: não se trata de um processo individual, mas, de um processo coletivo de uma espécie inteira que se transfigura *em um novo tipo de existência*.

> **The human species can, if it wishes, transcend itself — not just sporadically, an individual here in one way, an individual there in another way, but in its entirety, as humanity. We need a name for this new belief. Perhaps transhumanism will serve: man remaining man, but transcending himself, by realizing new possibilities of and for his human nature. *I believe in transhumanism*: once**

> **there are enough people who can truly say that, the human species will be on the threshold of a new kind of existence, as different from ours as ours is from that of Peking man. It will at last be consciously fulfilling its real destiny (HUXLEY: 1957: pg. 13-17).**

Os mitos antigos estão repletos de relatos de transmutação de seres humanos em outras espécies, além de pessoas com poderes mágicos. O que sonhamos como ficção, se realiza através da tecnologia. Nossas fantasias do passado paulatinamente se convertem em realidade presente e possibilidade futura, o que justifica a necessidade do estabelecimento de uma nova ética.

Esta nova ética, conforme visto aqui, emerge do conflito entre os significados de transumanismo conforme Dante e Huxley: na perspectiva de Dante, um novo céu e uma nova Terra concedidos por Deus (esperança); na visão de Huxley, não há nada garantido, mas há um objetivo pelo qual nós deveríamos lutar, ao invés de esperar por ele.

1.3. Prometeu desacorrentado.

Mesmo os seres humanos contrários ao transumanismo são *transanimais*, pois sua é a história de uma luta constante contra as determinações biológicas. A despeito de algumas espécies animais serem intelectualmente capacitadas a ponto de conseguirem manejar ferramentas, até o presente momento o animal humano é o único capaz de, através do uso de tecnologias de crescente sofisticação, suplantar os limites impostos pela biologia e dirigir o rumo das coisas. A regra darwiniana de seleção do mais apto pelo ambiente se reconfigura através da inteligência humana, pois é o ambiente que a nós se adapta. Nosso é o poder de modificar o curso dos rios, devastar ou recriar florestas e, num futuro bastante provável, reformular mundos inteiros através de processos de engenharia planetária conhecidos como “terraformação”. Chegamos a um desenvolvimento técnico tal que é possível, via engenharia genética, redesenharmos a nós mesmos e às futuras gerações.

Este é um dos pontos fulcrais da proposta transumanista: a ideia de que não apenas é possível, mas *desejável* que a humanidade se valha da *techne* para redesenhar a si própria e ao ambiente circundante, de modo a reduzir ou mesmo superar as limitações e sofrimentos impostos pela biologia. Os mecanismos evolutivos, cegos na natureza, assumem em nós uma *intencionalidade*. As

justificativas que referendam que tal proposta seja *desejável* demandam, contudo, escrutínio filosófico, dado que um agir que se sustente pela mera possibilidade da ação não traz em seu esteio uma ética. Nem tudo o que *pode ser* convém que seja traduzido em *dever ser*.

Tal escrutínio é imperativo sobretudo se considerarmos que, na atual conjuntura, as consequências do poder humano não se restringem, como no passado, a limites espaço-temporais estreitos. Conforme aponta Jonas, se as ações de nossos antepassados, quando incorretas, punham em risco determinadas cidades e ameaçavam o bem estar em um futuro de curto prazo, o poder humano contemporâneo é capaz de não apenas afetar a plena extensão do espaço terrestre, como também de negar a possibilidade de um amanhã para nossos descendentes (JONAS: 2015: pg. 31-34). Dada esta conjuntura, as controvérsias de outrora a respeito do papel prescritivo da filosofia não mais se sustentam. Novos modelos éticos precisam ser pensados, e, para tanto, o elemento da imaginação é indispensável, pois não basta considerar o que há e o que houve. Uma filosofia que se debruce sobre futuros prováveis é, dados os nossos atuais poderes e saberes, fundamental.

Vale ressaltar o que Hegel[145] disse, no que tange ao nosso desejo de determinar como o mundo deve ser, que (...) *a filosofia, de qualquer forma, sempre chega tarde demais para cumprir sua função* (...) *a coruja de Minerva inicia seu voo apenas com o início do crepúsculo* (...) (HEGEL: 1991: pg. 23). É possível, contudo, realizarmos uma releitura da alegoria hegeliana, salientando que a coruja de Minerva alça voo e vislumbra o mundo *antes* de um novo amanhecer. Esta é uma das razões pelas quais Hans Jonas é o principal filósofo a quem esta tese faz referência: ao longo de sua obra, sobretudo em *Das Prinzip Verantwortung*, Jonas evoca a necessidade de uma filosofia que se volte para o futuro. Ao dizer, por exemplo, que *O conhecimento do possível é heuristicamente suficiente para a doutrina dos princípios* (JONAS: 2015: pg. 73), o filósofo admite que prognósticos de longo prazo envolvem graus de extrapolação de alta complexidade, mas que

> **(…) this, however, does not preclude the projection of probable or arguably possible end effects. (…) Its means are thought experiences, which are not only hypothetical in the assumption of premises (...) but also conjectural in the inference from "if" to "then" (...) (JONAS: 2015: pg. 73-74).**

[145] Georg Wilhelm Friedrich Hegel (1770-1831), filósofo alemão.

A ética conforme se apresenta desde a antiguidade constitui, contudo, recurso insuficiente para realizar tal empreitada conjectural. O recurso da ficção é, por conseguinte, apontado por Jonas como

> **(...) a casuistry of the imagination which, unlike the customary casuistries of law and morality that serve the trying out of principles already known, assists in the tracking and discovering of principles still unknown. The serious side of science fiction lies precisely in its performing such well-informed thought experiments, whose vivid imaginary results may assume the heuristic function proposed. (See, for e.g., A. Huxley's Brave New World.) (JONAS: 2015: pg. 74).**

Outros pensadores salientam, assim como Jonas, a importância da ficção científica para a sociedade. Clarke, por exemplo, diz que

> **Fiction is more than non-fiction in some ways (…). You can stretch people's minds, alerting them to the possibilities of the future, which is very important in an age where things are changing rapidly**[146].

Para Foucault, a ficção não se limita a um papel instrumental conjectural, de previsão e alerta, mas funciona também como um recurso criador do futuro:

> **Parece-me que existe a possibilidade de fazer trabalhar a ficção na verdade, de induzir efeitos de verdade com um discurso de ficção e de fazer de modo que o discurso de verdade suscite algo que ainda não existe. Então, 'ficciona'. 'Ficciona-se' a história a partir de uma realidade política que a faz verdadeira, 'ficciona-se' uma política que ainda não existe a partir de uma verdade histórica (FOUCAULT: 1994: pg. 236).**

Temos, então, pelo menos dois sentidos para o ato de "ficcionar" (valendo-nos, aqui, do neologismo foucaultiano). Há o sentido dado pelo próprio Foucault, que é o de "imaginar com a finalidade de tornar real", trabalhando em prol da realização de intentos, que é o que o movimento transumanista pretende. O segundo sentido de "ficcionar" é o de prescrever um futuro desejável. Prescrever a cidade do futuro, contudo, é mais simples do que o outro sentido, que é o de se valer da ficção como um instrumento antecipatório para a ética, conforme proposto por Clarke. Adivinhar o futuro, afinal, envolve lidar com diferentes graus de probabilidade inerentes a um conjunto incomensuravelmente amplo de possibilidades difíceis de abarcar em

[146] Entrevista concedida para *The AV Club* em 18 de fevereiro de 2004. Disponível em: https://www.avclub.com/arthur-c-clarke-1798208319. Acessado em 12 de outubro de 2018.

decorrência de nossas limitações cognitivas. Prescrever um futuro desejável, por outro lado, é mais razoável. É o que aqui se pretende fazer, dado que, conforme Huxley sustenta, esta é nossa responsabilidade como espécie inteligente.

Tudo considerado, a presente tese se afina com Jonas em sua proposta da elaboração de uma nova ética capaz de considerar a atual condição humana, porque, no passado,

> **(...) *techne* in the form of modern technology has turned into an infinite forward-thrust of the race, its most significant enterprise, in whose permanent, self-transcending advance to ever greater things the vocation of man tends to be seen, and whose success of maximal control over things and himself appears as the consummation of his destiny (...) Ethical significance belonged to the direct dealing of man with man, including the dealing with himself: all traditional ethics is *anthropocentric* (...) The good and evil about which action had to care lay close to the act, either in the praxis itself or in its immediate reach, and were not a matter for remote planning. This proximity of ends pertained to time as well as space. The effective range of action was small, the time-span of foresight, goal-setting and accountability was short, control of circumstances limited (...). The long run of consequences beyond was left to chance, fate or providence (JONAS: 2015: pg. 35).**

A ética kantiana, que considera as relações entre indivíduos, não se torna obsoleta diante da nova ética, mas tem seu escopo de ação expandido. Tanto Jonas quanto os transumanistas concordam com a proposição de um modelo que vá além do antropocentrismo, a fim de evitar o maior de todos os males, que é a extinção da espécie. Não obstante tal concordância entre eles, há dissonâncias e objeções que demandam melhor exame.

Como no mito de Prometeu, o fogo é o elemento que nos torna dotados do poder de deuses. Desde que o descobrimos, não cessamos de alterar a natureza circundante e a nossa própria de um modo mais elaborado do que qualquer outra criatura senciente em nosso planeta. Nossa condição transanimal nos instiga a "ficcionar", a criar mundos. Podemos considerar que os deuses presentes em nossos mitos são bem mais do que a mera expressão de nosso entendimento supersticioso da natureza. Talvez sejam esses deuses uma nostalgia invertida: saudades do futuro. O impulso ficcional, existente até então apenas no tipo humano, nos permite criar narrativas que explicitam não apenas temores, mas também aspirações. O progresso tecnológico paulatinamente torna real o que era outrora ficção, e nos converte nas entidades míticas que um dia veneramos ou temíamos, na medida em que nos tornamos criaturas capazes de voar, de controlar a

eletricidade e o magnetismo e até mesmo de desvendar os segredos da vida e da morte.

Seríamos facilmente confundidos com deuses ou magos, se nossa existência pudesse ser testemunhada por um aldeão do século XIX, uma vez que a tecnologia de hoje só difere da magia de ontem pelo grau de entendimento. Como explicita Clarke em sua terceira lei, *qualquer tecnologia suficientemente avançada é indistinguível da magia*[147]. Ocorre que tal magnitude de conhecimento e poder tanto cria quanto destrói, e seria ingênuo louvar o estado da arte de nossa *techne* como algo intrinsecamente bom. A urgência de um novo modelo ético que dê conta do futuro se justifica, conforme Jonas, exatamente pelo tremendo conhecimento e poder técnicos alcançados pela humanidade:

> **O Prometeu definitivamente desacorrentado, ao qual a ciência confere forças antes inimagináveis e a economia o impulso infatigável, clama por uma ética que, por meio de freios voluntários, impeça o poder do homens de se transformar em uma desgraça para eles mesmos. A tese (...) é que a promessa da tecnologia moderna se converteu em ameaça, ou esta se associou àquela de forma indissolúvel. (...) Nenhuma ética tradicional nos instrui, portanto, sobre as normas do 'bem' e do 'mal' às quais se devem submeter as modalidades inteiramente novas do poder e de suas criações possíveis. O novo continente da práxis coletiva que adentramos com a alta tecnologia ainda constitui, para a teoria ética, uma terra de ninguém. (JONAS: 2015: pg. 21)**

Tudo considerado, a presente tese sustenta que as premissas de Jonas (necessidade de uma nova ética não-antropocêntrica, a proposta de uma heurística do medo) estão corretas, mas as conclusões tomadas pelo filósofo acerca do agir contradizem essas mesmas premissas. Sob uma perspectiva transumanista, é preciso ir além do antropocentrismo, que é o que Jonas também pretende. Mas é preciso, além disso, superar o biogeocentrismo jonasiano.

Para realizar tal superação, é necessário levar em séria consideração as principais críticas contra o transumanismo contemporâneo. Temos então as personagens principais que justificam a discussão ética aqui apresentada: de um lado, o movimento transumanista e sua apologia ao uso da *techne* para o melhoramento e a superação humana; do outro, filósofos contemporâneos de viés

[147] A terceira lei de Clarke é por ele descrita em 1973, no livro *Profiles of the Future: An Inquiry into the Limits of the Possible*. Versões desta mesma lei surgem precedentemente, quase sempre no contexto da literatura de ficção, como por exemplo em *The Hound of Death* (1933), de Agatha Christie, que diz *The supernatural is only the natural of which the laws are not yet understood*.

conservador, tais quais o próprio Jonas, além de Fukuyama[148] e Sandel[149], cujas objeções e alertas devemos seriamente considerar.

1.4. Objeções contra o transumanismo.

1.4.1. Primeira objeção: o "Paradoxo do Navio de Teseu".

Dentre as críticas existentes contra o transumanismo, uma das mais recorrentes se pauta em um suposto dualismo entre mente e matéria preconizado pelos transumanistas. Este equívoco ocorre em decorrência da utilização do verbo *to upload* para descrever o processo hipotético de transferência de uma mente humana para um construto artificial aperfeiçoado e de longevidade indefinida, algo como uma versão sintética e melhorada de nossos corpos. Todavia, com raras exceções, os transumanistas se definem como materialistas e assumem que a consciência demanda um veículo físico, não havendo, portanto, algo como uma consciência incorpórea. Conforme nos explica More[150]:

> **A functionalist holds that a particular mental state or cognitive system is independent of any specific physical instantiation, but must always be physically instantiated at any time in some physical form. Functionalism is a form of physicalism that differs from both identity theory (a mental state is identical to a specific brain state) and behaviourism (mental terms can be reduced to behavioural descriptions). According to functionalism, mental states such as beliefs and desires consist of their causal role. That is, mental states are causal relations to other mental states, sensory inputs, and behavioural outputs. Because mental states are constituted by their functional role, they can be realized on multiple levels and manifested in many systems, including non-biological systems, so long as the system performs the appropriate functions (MORE: 2013: pg. 7).**

O paradoxo do navio Teseu, conforme elaborado por Plutarco[151] em *Vidas Paralelas*, rendeu ao longo dos séculos as mais diversas considerações e respostas por parte dos filósofos, e é aqui útil para a exposição do funcionalismo transumanista. Resumidamente, o paradoxo se apresenta da seguinte forma (PLUTARCO: 2008: pg. 20): Teseu, em seu navio Argos, parte em uma empreitada de longa duração. Com o passar dos anos, as peças envelhecidas do Argos são

[148] Filósofo e economista politico norte-americano. Nascimento: Chicago, EUA, 1952.
[149] Filósofo norte-americano. Nascimento: Minneapolis, EUA, 1953.
[150] Max More, born in 1964, British philosopher and futurist.
[151] Lucius Mestrius Plutarchus (46-120), filósofo grego.

trocadas por outras novas do mesmo material até que, tempos depois, todas as partes originais são substituídas. Questiona-se, pois: o novo navio é o mesmo navio de outrora? O Argos continua a ser o mesmo Argos? Se pensarmos em termos aristotélicos, levando em conta as quatro causas (formal, material, final e eficiente), a mera mudança da causa material não é suficiente para configurar um novo navio. Afinal, trata-se de uma substituição de partes do Argos por outras de igual natureza: madeira substituindo madeira.

Entretanto, se o que vier a substituir um pedaço de madeira for uma peça de metal, o navio passa a ser formado por um material de natureza inteiramente diversa, ou seja, não apenas a causa material foi modificada, mas também a causa eficiente que torna possível a existência do navio. Se aplicarmos a lógica de Leibniz[152], concluiremos que não se trata, portanto, do mesmo Argos, pois "A" é idêntico a "B" se e somente se "A" e "B" possuírem as mesmas propriedades, de modo que tudo o que for verdade para "A", o será para "B". Ora, um Argos metálico será mais resistente do que sua prévia versão de madeira. É possível até mesmo que os engenheiros reformem o navio de modo a modificar a sua causa formal, assumindo que um novo desenho o torne mais eficiente. Ao fim do processo, a única causa comum entre o Argos original e o de décadas depois é a causa final, pois o objeto continua a ser um barco e a ter a mesma finalidade, que é a de transportar pessoas em viagens marítimas. Poderíamos até mesmo imaginar uma situação na qual os engenheiros não apenas modificassem a composição do navio, como também sua finalidade existencial, convertendo a embarcação em um transporte funcional tanto em água quanto em terra e ar. Modificada sua causa final, o único ponto em comum entre o novo e o velho Argos é o nome.

A alegoria do navio de Teseu é aplicável ao ente humano. É sabido que, ao longo de sua existência, um corpo humano tem suas partes substituídas por outras de igual natureza. A diferença fundamental entre homem e navio se deve ao fato de o processo substitutivo das peças humanas ser *autopoiético*, não demandando – em primeira instância - a interferência de agentes externos. O processo de crescimento do corpo e suas modificações (surgimento e perda dos pelos, aumento e perda de massa muscular etc.) não constitui mudança de forma, pois esta se mantém antrópica, e tanto a origem quanto a finalidade das peças substituídas é a mesma.

[152] Gottfried Wilhelm Leibniz (1646-1716), filósofo alemão.

Um homem de cinquenta anos de idade não possui quase nenhuma célula em comum com sua versão de vinte anos de idade, mas entende-se que ele é "o mesmo homem". Célula muscular substitui célula muscular e assim por diante, ou seja, a causa eficiente permanece idêntica[153].

Não obstante o processo de substituição de peças do corpo humano (e de qualquer corpo biológico) seja autopoiético, a *techne* nos permite interferir de modo a executar substituições por peças cuja causa eficiente é distinta. É o *homo faber*, que, com seu agir transbiológico, redesenha a si mesmo. Partes artificiais executam as mesmas funções das partes biológicas substituídas, ou seja, sua causa final é idêntica.

A biotecnologia capaz de permitir a diminuição ou eliminação do sofrimento modifica a nossa natureza humana? Dificilmente encontraremos respaldo filosófico ou legal que justifique a negação da humanidade de um indivíduo que possua, por exemplo, órgãos ou membros artificiais. Mas e se *todas* as peças do corpo forem substituídas por equivalentes sintéticas mais resistentes e duradouras? E se tal substituição incorresse em vantagens super-humanas? Em que momento, se é que há um, deixamos de ser humanos para nos tornarmos outra coisa?

Ainda que o transumanismo não seja dualista, mas, conforme demonstrado, funcionalista, este funcionalismo nos põe diante de outra questão que interessa particularmente à prática médica: é ético permitir a substituição voluntária de partes biológicas por equivalentes sintéticas mais eficientes, ainda que não haja sofrimento a ser curado? O movimento transumanista defende o direito a tal reposição, conforme se pode verificar no tópico 7 da *Transhumanist Declaration:*

> **We favor morphological freedom – the right to modify and enhance one's body, cognition, and emotions. This freedom includes the right to use techniques and technologies to extend life, preserve the self though cryonics, uploading, and other means, and to choose further modifications and enhancements (VITA-MORE et al: 2013: pg. 55).**

É importante ressaltar que, na medida em que as substituições tecnológicas não implicam modificação da função, pode-se falar em *transbiologismo*, *transanimalismo*, mas não em transumanismo. Um cristalino artificial é construído de modo a emular as exatas funções de um cristalino biológico. Uma prótese de braço

[153] Observe-se que, quando ocorre mudança da causa eficiente de uma célula, temos o câncer. Se tal condição não for corrigida, o organismo encontra seu fim.

elaborada a partir da tecnologia atual permite executar muitas (mas não todas) das funções realizadas por um braço orgânico. Um coração sintético pretende apenas substituir o seu equivalente natural doente.

Mas digamos que todas as peças do maquinário biológico humano sejam gradualmente substituídas, inclusive os neurônios, até que nada mais reste de orgânico no indivíduo. O que sustenta a identidade, neste caso, é a memória: um hipotético ser humano artificialmente reconstruído se reconheceria como o ser humano biológico de outrora, e, ainda que se percebesse diferente em pensamentos e gostos, poderíamos dizer que se trata do mesmo ser humano por conta de uma linha biográfica. Contudo, esta substituição holística que permite reposição indefinida possibilita mortalidade igualmente indefinida. As novas tecnologias podem viabilizar órgãos e membros melhorados, mais poderosos. Poderíamos sugerir que um indivíduo potencialmente imortal se apartasse do conjunto de seres a quem chamamos de humanos? Este é um problema inteiramente novo cujos impactos sociais são imensos. As consequências dessas novas biotecnologias envolvem, por exemplo, a diminuição da taxa de mortalidade e o prolongamento da vida, o que termina causando impacto econômico na previdência, além de complicações ecológicas decorrentes da presença humana cada vez maior, persistente e interferente. À medida que morrermos cada vez mais tarde ou mesmo pararmos de morrer, problemas ainda maiores se seguirão. Isto nos conduz à segunda objeção ao transumanismo: os riscos inerentes à ascensão de uma nova espécie inteligente e mais poderosa.

1.4.2. Segunda objeção: a ascensão dos super-humanos.

É Fukuyama, ao se referir ao transumanismo como “a ideia mais perigosa do mundo”, quem expressa uma significativa preocupação: a emergência de uma classe capaz de, através do uso de recursos econômicos privados, viabilizar a si mesma como super-humana. Conforme Fukuyama:

> **The first victim of transhumanism might be equality. (...) Underlying this idea of the equality of rights is the belief that we all possess a human essence that dwarfs manifest differences in skin color, beauty, and even intelligence. This essence, and the view that individuals therefore have inherent value, is at the heart of political liberalism. But modifying that essence is the core of the transhumanist project. If we start transforming ourselves into something superior, what rights will these enhanced creatures claim, and what rights will**

> **they possess when compared to those left behind? If some move ahead, can anyone afford not to follow? These questions are troubling enough within rich, developed societies. Add in the implications for citizens of the world's poorest countries -- for whom biotechnology's marvels likely will be out of reach -- and the threat to the idea of equality becomes even more menacing.[154]**

Ainda que tal preocupação possa dar a impressão de ser apenas ficcional[155], deveríamos levá-la a sério. Sendo nosso mundo já tão desigual, caracterizado por pessoas que têm acesso a recursos que outras não têm, não estaria o transumanismo aprofundando o abismo desta desigualdade ao criar versões humanas tecnologicamente melhoradas?

A despeito dos pertinentes receios de Fukuyama, vale destacar que o avanço das tecnologias tende a torná-las mais baratas. O que começa disponível para apenas alguns poucos indivíduos ricos, não muito tempo depois se torna acessível a pessoas com menor poder aquisitivo. Michio Kaku[156] aborda esta questão, ao demonstrar que, historicamente, tecnologias evoluem em quatro estágios básicos: um estágio inicial, em que o produto é tão precioso que permanece inacessível até mesmo pelos mais ricos; em seguida, a tecnologia se torna disponível para quem puder pagar (caro) por ela; o terceiro estágio é marcado por tamanho barateamento da tecnologia, que ela se torna amplamente difundida; no quarto estágio, a tecnologia está incorporada ao cotidiano de tal forma que se torna uma *definição de estilo*, sendo praticamente decorativa. Um bom exemplo é a eletricidade controlada por humanos: inicialmente inacessível, restrita a laboratórios, torna-se então um produto disponível para quem puder pagar bastante caro por ela; em seguida, tem seu custo barateado de tal forma que, hoje em dia, quase qualquer pessoa dela usufrui; em sociedades desenvolvidas, a eletricidade é tão banal que chegou ao quarto estágio econômico da tecnologia, sendo utilizada como elemento decorativo (KAKU: 2011: pg. 335-337). Os exemplos são vastos, e poderíamos demonstrar os mesmos quatro estágios na história dos medicamentos, das tecnologias médicas, sempre lembrando que não muito tempo nos separa de um passado em que meros pares de sapatos ou óculos constituíam recursos acessíveis apenas a pessoas abastadas. Tudo considerado, é bastante provável que os melhoramentos

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[154] FUKUYAMA, Francis. *Transhumanism: The World's Most Dangerous Idea*. Disponível em: http://www.au.dk/fukuyama/boger/essay/. Acessado em 2 de novembro de 2018.

[155] E, de fato, recorrentemente denunciado em livros e filmes de ficção científica, como em *GATTACA* (1997), onde seres humanos normais sofrem discriminação genética.

[156] Michio Kaku (nascido em 1947), físico americano.

transumanos sejam inicialmente restritos aos mais ricos, mas barateiem com o tempo. Na prática, o indivíduo rico paga mais caro para ter acesso a uma tecnologia que ainda tem muito a evoluir, ou seja, cumpre um papel de "cobaia", de "usuário beta". Quando esta tecnologia se torna mais acessível financeiramente à população em geral, está até mesmo mais segura.

Ainda que os melhoramentos transumanos se tornem cada vez mais difusos, há também o risco da aplicação irresponsável das tecnologias. Ainda conforme Fukuyama:

> **Nobody knows what technological possibilities will emerge for human self-modification. But we can already see the stirrings of Promethean desires in how we prescribe drugs to alter the behavior and personalities of our children. The environmental movement has taught us humility and respect for the integrity of nonhuman nature. We need a similar humility concerning our human nature. If we do not develop it soon, we may unwittingly invite the transhumanists to deface humanity with their genetic bulldozers and psychotropic shopping malls.**[157]

Além de todo o exposto, um dos maiores problemas diz respeito justamente ao impacto ambiental, considerando transumanos de longevidade estendida (ou mesmo indefinida) em um planeta onde novos indivíduos estão sempre nascendo. Todavia, ainda que Fukuyama tenha razão em suas advertências, não se trata de nada que não seja passível de regulação.

Se para Fukuyama "a ideia mais perigosa do mundo" é o transumanismo, a presente tese advoga o exato oposto: a ideia mais perigosa é nos mantermos humanos, à mercê dos caprichos do acaso. Não se nega, aqui, que existam perigos contingentes ao progresso técnico, nem tampouco se rejeita a necessidade de regulações deste impulso prometeico. Mas, levando em conta um universo onde o acaso pode ser implacável, como nas ocorrências de extinção global, a nossa maior probabilidade de sobrevivência enquanto espécie reside no uso ético da tecnologia e *necessariamente* na superação da nossa limitação ao planeta Terra. É verdade que este mesmo impulso prometeico pode inviabilizar o mundo e nos destruir, mas este é um cenário contingente, enquanto a extinção natural constitui certeza. A humanidade tem contado com a sorte por um tempo que, cosmicamente falando, é bastante curto, e é papel da presente tese sempre lembrar que

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[157] FUKUYAMA, Francis. *Transhumanism: The World's Most Dangerous Idea*. Available at: http://www.au.dk/fukuyama/boger/essay/. Accessed in November 2nd, 2018.

> **(...) that all the labours of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius are destined to extinction in the vast death of the solar system, and that the whole temple of Man's achievement must inevitably be buried beneath the debris of a universe in ruins – all these things, if not quite beyond dispute, are yet so nearly certain that no philosophy which rejects them can hope to stand (RUSSEL *apud* CLARKE: 1970: pg. 256)**

Tudo considerado, avancemos pois para a próxima objeção ao transumanismo: os perigos de "brincar de Deus".

1.4.3. Terceira objeção: engenharia genética.

Por fim, um dos argumentos principais contra o transumanismo acusa o movimento de ambicionar uma suposta "perfeição" da humanidade a partir de práticas eugênicas ou de manipulação genética. A perfeição como meta caracteriza ideais utópicos, o que é bem diferente do que o transumanismo pretende. Conforme More,

> **(…) Transhumanists seek not utopia, but perpetual progress – a never-ending movement toward the ever-distant goal of extropia. If the transhumanist project is successful, we may no longer suffer some of the miseries that have always plagued human existence. But that is no reason to expect life to be free if risks, dangers, conflicts, and struggle. Outside, perhaps, of David Pearce's goal of eliminating all suffering, you will have to search far and wide to find any suggestion of utopia or perfection in transhumanist writing. (…) Transhumanism is defined by its commitment to shaping fundamentally better futures as defined by values, goals, and general direction, not specific goals. Even to extent that a goal is somewhat specific – say, abolishing aging, becoming post-biological, or enhancing cognitive abilities to some arbitrary degree – the mans and time frame in which these might be achieved are open to differing views. Transhumanism per se says much about goals but nothing about specific means or schedules. (…) Transhumanists do seek to improve the human body, by making it resistant to aging, damage, and disease, and by enhancing its senses and sharpening the cognition of our biological brains. (…) In reality, transhumanism doesn't find the biological human body disgusting or frightening. It does find it to be a marvellous yet flawed piece of engineering. It could hardly be otherwise, given that it was designed by a blind watchmaker, as Richard Dawkins put it. True transhumanism *does* seek to enable each of us to alter and improve (…) the human body and champions morphological freedom. Rather than denying the body, transhumanists typically want to choose its form and be able to inhabit different bodies, including virtual bodies (MORE: 2013: pg. 14-15).**

Tudo considerado, é incorreto dizer que o transumanismo almeja *perfeição* (um estado final). O que se busca é o *aperfeiçoamento*, um processo sem fim.

Ambicionar um hipotético estado de perfeição, se fosse o caso, aproximaria o transumanismo das motivações eugênicas nazistas e de suas ideias de uma "raça superior". O nazismo, contudo, se pauta em políticas de eugenia negativa, a saber: esterilização compulsória ou estimulada de indivíduos portadores de características consideradas desagradáveis; aborto de embriões e de fetos portadores de traços genéticos indesejáveis; não se limitando a indivíduos não-nascidos, o nazismo preconiza, como amplamente se sabe, o genocídio.

Transumanistas rejeitam a eugenia negativa em todas as suas variantes, mas estimulam a chamada nova eugenia positiva, caracterizada sobretudo pela seleção *in vitru* de embriões desejáveis. Esta seleção, ressalte-se, não se daria (ou não deveria se dar) a partir de meros critérios estéticos, mas teria por objetivo eliminar do gênero humano determinados marcadores genéticos causadores de grave sofrimento.

Tomemos como exemplo o caso do gene de Huntington, uma doença autossômica dominante de alta prevalência entre europeus (estimativa: um a cada cem mil nascimentos[158]), para a qual não há cura conhecida. Um portador do gene Huntington tem 50% de chance de ter um filho portador da doença[159], que normalmente se manifesta por volta dos quarenta anos de idade e é caracterizada por perda gradual e irreversível do controle motor, da sanidade mental, ou seja, de toda a autonomia. O resultado é a morte precoce após vários anos de lenta e sofrida degeneração. Não se preconiza a esterilização forçada ou estimulada de portadores do gene Huntington, mas a eugenia positiva: seleção *in vitru* dos embriões não portadores da doença. À questão "é ético selecionar embriões?", se contrapõe outra: "é ético condenar uma pessoa a uma existência condicionada a uma doença grave, incurável e causadora de tamanho sofrimento, sendo que isso poderia ter sido evitado?".

Ocorre que, se a eugenia positiva é considerada aceitável em casos extremos pela ética médica, sua aplicação em outras situações não necessariamente se justifica, embora possa ser tentadora. Uma fecundação *in vitru* normalmente resulta em vários embriões, mas apenas um deles é implantado no útero e os demais são descartados. É possível, dada a tecnologia atual, rastrear com grande facilidade

[158] De acordo com a European Huntington's Disease Network. Disponível em: http://www.ehdn.org/ acessado em 2 de dezembro de 2018.
[159] Se ambos os genitores portarem o gene, as chances de transmissão aumentam para 75%.

quais dentre os embriões possuem oncogenes ou outras características menos desejáveis, desde uma simples miopia até marcadores de depressão. A ética médica não hesita em descartar embriões sindrômicos uma vez identificados, mas não procede do mesmo modo diante de qualquer tipo de defeito genético. Há, afinal, traços administráveis, ainda que indesejáveis, e eliminá-los pode resultar na eliminação de outros traços altamente desejáveis. Ao eliminarmos um organismo por conta de seus genes de câncer, miopia ou Alzheimer, estamos também eliminando toda a singular importância de uma vida única. Estaremos privando o mundo de um ser cuja existência teria significado para ele mesmo e para muitos outros, a despeito do eventual sofrimento envolvido por conta desta ou daquela condição. Vale ressaltar que não se trata, aqui, de um argumento pautado na "maior importância" de indivíduos geniais cuja existência foi marcada por eventuais limitações biológicas, mas de uma defesa ao direito à existência de *todo e qualquer* ente humano. Tudo considerado, o mesmo não pode ser dito da eliminação de casos graves, como o Huntington? Que direito temos de privar a existência de uma pessoa cuja vida seria perfeitamente normal por pelo menos quatro décadas, principalmente levando em conta que a cura da doença pode ser descoberta a qualquer momento? Estas são questões que não trazem uma resposta fácil, sobretudo considerando que, em uma fertilização *in vitru*, vários embriões serão descartados de qualquer forma. Por que não selecionar a melhor semente? Mas ao fazermos isso não estamos autorizando todos a fazerem o mesmo e incorrendo no risco de criar uma sociedade aos moldes de *GATTACA*[160]? Embora seja tentador praticar a eugenia positiva e, de fato, existam transumanistas que sustentam este direito, há outra prática que não demanda o impedimento de nenhum indivíduo à existência: a edição genética.

The *Clustered Regularly Interspaced Short Palindromic Repeats* technology (CRISPR), em franco desenvolvimento, permite a deleção seletiva de partes do DNA. Biologia é, basicamente, informação. Uma vez identificados os genes causadores de sofrimento, é possível deletá-los do mesmo modo que um editor de texto elimina erros gramaticais[161]. Em tese, é possível até mesmo acrescentar

[160] Filme norte-americano de ficção científica (1997) que mostra um mundo onde as reproduções obrigatoriamente se realizam por seleção genética, discriminando indivíduos nascidos sem triagem prévia. Direção e roteiro de Andrew Niccol.

[161] E, de fato, em 2018 um geneticista chinês alegou ter criado os primeiros seres humanos imunes ao vírus HIV, o que nos põe diante de sérias questões bioéticas. Informação disponível em: https://www.technologyreview.com/s/612458/exclusive-chinese-scientists-are-creating-crispr-babies/, site acessado em 2 de dezembro de 2018.

informação, conferindo ao organismo qualidades antes inexistentes. As possibilidades desta tecnologia são amplas, e envolvem supressão e reversão não apenas de doenças, como também do envelhecimento, aumento de força e cognição, em suma: *melhoramento*, o grande motor do transumanismo. À medida que a tecnologia CRISPR avançar e passar pelos quatro estágios tecnológicos descritos no tópico precedente, tornando-se suficientemente avançada e amplamente difundida, marcos regulatórios se farão necessários.

O objetivo transumanista de corrigir as falhas da natureza tende a ser objetado pelo pensamento conservador a partir do argumento de que tais procedimentos são antinaturais, rejeitando a *dádiva* e o encantamento diante do inesperado (SANDEL: 2007: pg. 59). É interessante observar, aqui, um paralelo possível entre Sandel e Jonas: para ambos, o acaso, o erro, o imprevisto e o caos constituem um fator transcendente. As tentativas transumanistas de excluir o "erro" da natureza seriam, portanto, uma negação dessa transcendência. Há, contudo, uma diferença fundamental desses autores na forma de encarar o acaso. Para Sandel, o problema principal diz respeito a aspectos práticos, valores humanos e a vida em sociedade, visto que

> **(...) That we care deeply about our children and yet can't choose the kind we want teaches parents to be open to the unbidden.. (...) One of the blessings of seeing ourselves as creatures of nature, God, or fortune is that we are not wholly responsible for the way we are. The more we become masters of our genetic endowments, the greater the burden we bear for the talents we have and the way we perform (SANDEL: 2013: pg. 98-99).**

Sandel prossegue, apontando uma relação intrínseca entre as dádivas do acaso e as virtudes humanas:

> **Why, after all, do the successful owe anything to the least-advantaged members of society? One compelling answer to this question leans heavily on the notion of giftedness. The natural talents that enable the successful to flourish are not their own doing but, rather, their good fortune – a result of genetic lottery. If our genetic endowments are gifts, rather than achievements for which we can claim credit, it is a mistake and a conceit to assume that we are entitled to the full measure of the bounty they reap in a market economy. We, therefore, have an obligation to share this bounty with those who, through no fault of their own, lack comparable gifts. Here, then, is the connection between solidarity and giftedness: A lively sense of the contingency of our gifts — an awareness that none of us is wholly responsible for his or her success — saves a meritocratic society from sliding into the smug assumption that success is the crown of virtue, that the rich are rich because they are more deserving than the poor (SANDEL: 2013: pg. 98-99).**

Contudo, a despeito de ter razão ao enfatizar que nenhum de nós é o único responsável pelo próprio sucesso, Sandel comete um erro ao apostar na desigualdade natural do acaso cego como fonte fundamental da solidariedade. Genes não constituem destino, e não há garantia alguma de que uma pessoa geneticamente bem fornida será bem sucedida. No máximo, o que se pode fazer é impedir que ela sofra de determinados males intrínsecos, embora não seja possível evitar os extrínsecos, relacionados à má sorte, acidentes e outros acasos. Pode-se conceder à pessoa uma melhor estrutura orgânica para agir no mundo, no máximo, mas nada se pode garantir a respeito da relação dela com os outros e com a existência. Por mais que a engenharia genética iguale as condições de origem dos indivíduos, as circunstâncias ambientais continuam a ser regidas pelo acaso, pelo fator “sorte”. A contingência da vida não é cancelada pela seleção ou edição de genes. O que se reduz (ou se elimina) é a desigualdade orgânica do ponto de partida. A solidariedade humana não demanda extremo sofrimento alheio para existir, pois já há acaso e acidente suficiente no mundo para estimular, em nós, o impulso de ajudar a quem precisa. Uma existência sem doenças, ou marcada pela presença de super-humanos mental e fisicamente poderosos não é uma existência sem sofrimento, que não demande apoio recíproco. A engenharia genética, embora melhore as condições individuais e sociais, não cancela o acaso da vida.

Além disso, é possível usar um dos argumentos do Sandel para *apoiar* o transumanismo. Dizer que temos a obrigação de dividir essas recompensas com aqueles que, por motivos alheios a eles mesmos, não têm dons comparáveis é exatamente o que pode justificar a socialização de genes vantajosos. Terapias de edição genética fariam parte do conjunto de atos solidários, o que é bem diferente do ato de selecionar a cria, por parte de quem pode pagar por isso, criando uma divisão entre “acidentais” e “escolhidos”.

Há também outra forma de encarar o acaso. Uma forma metafísica. É o que nos oferece Jonas, ao se perguntar:

> **How, then, does development come about? Why didn't the universe stop with the attainment of the elements, radiation, and the laws of causality? Why didn't it simply remain at this stage of most general order, with the macrocosmic and chemical formations that grew directly out of it? The answer to this question was given by Darwin There was always enough "disorder" left over to occasion the formation of new characteristics (structural factors) by accidental, random events, and the momentary successes were subject to the process of selection with its criterion of survival by sheer numbers. This is the required 'transcending factor' that leads to the new and then to the higher, and it does so**

> **without pre-information, without logos, without planning, even without striving, but only by means of the susceptibility of a given order, already coded for "information", to a surrounding disorder that forces itself upon it as additional information (JONAS: 2010: pg. 17).**

Considerando a “desorganização”, o “acaso cego” como sendo os fatores transcendentes do universo, e supondo isso como verdadeiro, deparamo-nos com um problema: a intencionalidade humana, o desejo de impor ordem ao caos, de corrigir a desorganização, em suma, o impulso de *dirigir* a evolução não constituiria um problema metafísico? A inteligência humana é o exato oposto do acaso cego e desordenado. Seríamos, com nossa inteligência, negadores da transcendência? Para responder a tais questões, faz-se indispensável abordar questões ontológicas sobre a natureza de nosso universo e sobre a própria vida em si. É por estas searas que trafegaremos no capítulo *Metafísica*.

1.5. A *Criança-Estrela*[162] contra o antropocentrismo.

Tudo considerado, retornamos pois ao ponto ético fulcral do transumanismo na presente tese: *a expansão biocósmica como um imperativo moral*. Diante da pergunta “por que isso deveria ser feito?”, mesmo a resposta “porque nós devemos sobreviver” pode soar insuficiente, e gera uma nova questão: “qual a relevância de nossa sobrevivência? O que nos faz tão importantes?”. O que se pretende sustentar aqui, por fim, é que toda entidade senciente possui valor intrínseco. A inteligência humana não nos dota de maior valor intrínseco em comparação aos demais animais, mas nos põe obrigações morais uns com os outros, com os animais e com o mundo em si.

Uma das mais antigas discussões da história da bioética gira em torno de uma distinção clara e precisa entre valor intrínseco e valor instrumental. Dentre as coisas existentes no universo, quais delas teriam valor por si mesmas, e quais delas seriam valiosas apenas instrumentalmente? Esta discussão se aproxima do antigo contraste entre contingência e necessidade. O valor instrumental, por exemplo, é sempre contingencial, pois depende do contexto. O valor intrínseco, por sua vez, evoca a ideia de um ente que possui valor por si mesmo, o que nos põe diante de um questionamento filosófico difícil de responder: como podemos falar em valor

[162] A “Criança-Estrela” (*Starchild*) é uma entidade cósmica recém-nascida, personagem ficcional do romance “2001”, de Arthur C. Clarke.

intrínseco, se qualquer valor depende de um observador que o reconheça? Para alguns pensadores, é mais adequado falar em “valor intrínseco truncado” (CALLICOTT *apud* COCKELL: 2016: pg. 169), enquanto outros defendem a ideia de um valor intrínseco de fato inerente (ROLSTON *apud* COCKELL: 2016: pg. 169). Não é escopo da presente tese questionar se há ou não algo de metafisicamente real no conceito de valor intrínseco, ou se isso é uma convenção nominalista. A questão aqui se põe da seguinte forma: *admitindo que exista valor intrínseco, que ente ou entes são detentores desta qualidade, e por quê?*

Sob uma perspectiva antropocêntrica, apenas o ente humano é dotado de valor intrínseco, e todos os outros elementos do universo são meros instrumentos. Vale ressaltar que pode ser tentador definir o antropocentrismo como ambientalmente destrutivo, uma vez que tudo o que não é um humano é considerado meramente instrumental. Há alguma razão nesta crítica contra o antropocentrismo se levarmos em conta quão predatório tem sido o nosso comportamento neste planeta. A ignorância, contudo, é mais um elemento contingente do antropocentrismo, mas não sua essência. Mesmo que a natureza seja vista meramente como um instrumento, este instrumento pode ser bem cuidado. Há a possibilidade de um antropocentrismo ambientalmente correto, caracterizado por um auto-interesse esclarecido ao estabelecer uma relação não predatória com o ecossistema. Dado que a humanidade depende de um amplo conjunto de entes de valor instrumental (plantas, animais, objetos inanimados), é perfeitamente possível conceber um antropocentrismo em uma abordagem não-egoística, que leva futuras gerações em consideração.

Ou seja, não é o antropocentrismo a razão dos problemas ambientais, e sim uma sua variante: o antropocentrismo imediatista ou egoísta, centrado em resultados rápidos, e que desconsidera as gerações futuras. Uma ética verdadeiramente antropocêntrica não consideraria apenas os indivíduos existentes, mas a espécie humana inteira, presente e futura. Tudo considerado, emerge a questão: *por que o antropocentrismo precisa ser superado?*

Para responder a isso, é preciso retornar a Jonas. Mobilizado pela premente necessidade de elaborar um novo imperativo ético capaz de nos prevenir do que ele mesmo define como sendo o *summum malum*, Jonas se pauta em Kant. Em contraposição ao caráter privado do imperativo kantiano, regulador do indivíduo, a proposta jonasiana se dirige às políticas públicas. Observe-se, contudo, que os

novos imperativos jonasianos se mantêm, todos eles, atados a uma perspectiva antropocêntrica. Assim o autor os elabora:

> **A suitable imperative to serve as a new guide for human action and for the new form of acting individual should roughly go along the following lines: "Act in such a way that the effects of your action are compatible with the permanence of truly human life on Earth; or, expressed in negative terms: "act so that the effects of your actions are not destructive for the future possibility of such life"; or simply: "Do not compromise the conditions for an indefinite continuation of humanity on Earth"; or, again turned positive: "In your present choices, include the future wholeness of Man among the object of your will" (JONAS: 2015: pg. 47-48).**

Em todas as variantes propostas, a conclusão é a mesma: urge garantir o futuro da humanidade através do bom cuidado dirigido à natureza. Mas se a finalidade é, conforme o filósofo, a garantia de *humanidade*, *autêntica vida humana* e *integridade do homem*, é porque ela possui valor intrínseco. Ao considerar o homem a finalidade última da ação ética, Jonas não escapa ao antropocentrismo. Tal postura constitui avanço em relação ao antropocentrismo imediatista e egocêntrico que almeja satisfação em detrimento do bem estar da humanidade futura, mas, ainda assim, é antropocentrismo, mesmo que Jonas não se dê conta disso.

Não obstante este novo imperativo atenda às urgentes necessidades ambientais, ele é insuficiente para impedir o *summum malum* jonasiano, dado que restringe a vida humana ao mundo. E, de fato, o tipo humano e a Terra estão inexoravelmente vinculados. Para sobreviver ao fim fatal do próprio mundo, a autoconsciência que se manifesta em nós precisará assumir novas formas pós-humanas. Insistir no apego à forma humana e à Terra, longe de evitar a extinção, a garante.

Tudo considerado, é possível reformular o novo imperativo jonasiano a partir dos critérios transumanistas de Huxley: *Aja de modo a que os efeitos de sua ação sejam compatíveis com a existência da autoconsciência neste e em outros mundos*. Mesmo se considerarmos a importância da preservação do planeta no qual nos encontramos (e acerca dessa importância a presente tese nada contesta), mais adequado seria propor: *Aja de modo a que os efeitos de tua ação garantam a possibilidade futura da autoconsciência*. Poderíamos também destacar os perigos da inação, ressaltando que o não-agir é, ele mesmo, uma categoria da ação, sobretudo quando se tem conhecimento dos fatores em jogo: *Que tua inação não ponha em perigo as condições necessárias para a preservação da autoconsciência*. Note-se

que, nas versões aqui apresentadas, a não obrigatoriedade de restrição ao planeta atende à proposta de evitamento da extinção.

Escapar do antropocentrismo demanda entender a proposta fulcral do transumanismo: a humanidade conforme a conhecemos não é finalidade última, mas etapa de uma incessante mutação cósmica. O que em nós há de valor intrínseco não se atrela à nossa forma, mas à nossa consciência. Pois, embora para o transumanismo em geral não exista algo como uma *res cogitans* desligada da *res extensa*, esta última pode ser moldada, modificada, sendo mero instrumento da primeira, que é a verdadeira detentora do valor intrínseco.

O sétimo tópico da *Declaração Transumanista* revela um modelo ético zoocêntrico, uma vez que leva em conta não apenas a espécie humana, mas toda e qualquer criatura senciente. Mas não se trata de um zoocentrismo clássico, visto que leva em conta também formas de vida alienígenas que venham a ser descobertas, além de formas de vida artificiais. Embora estas formas hipotéticas sejam no momento ficcionais, podem vir a ser identificadas ou criadas no futuro. Conforme a declaração:

> **We advocate the well being of all sentience, including humans, non-human animals, and any future artificial intellects, modified life forms, or other intelligences to which technological and scientific advance may give rise (VITA-MORE et al: 2013: pg. 54).**

A ideia de “desejável”, conforme explicitada pelo excerto precedente, se restringe ao *minus bonum*, que é o bem estar individual das criaturas sencientes, sejam elas humanas ou não. Por mais que tal consideração vá além da perspectiva antropocêntrica, ela sozinha seria insuficiente como justificativa de uma nova ética. Pensar a tecnologia e antecipar possíveis e perigosos cenários neste processo de ação intencional sobre o mundo demanda mais do que uma justificativa fundada no *minus bonum*. Afinal, levar em conta o bem estar de indivíduos existentes não necessariamente leva em conta o futuro das espécies e o direito delas à existência. Basta lembrar que o preço a se pagar pelo bem estar dos humanos atuais nos coloca como devedores do planeta. Conforto e bem estar têm um custo, e ele tem se mostrado bastante alto.

Nos tópicos três e quatro, os transumanistas se aproximam de Jonas, quando consideram, também, o mau uso das tecnologias e os riscos que envolvem o impulso prometeico desmedido:

> **We recognize that humanity faces serious risks, especially from the misuse of new technologies. There are possible realistic scenarios that lead to the loss of the most, or even all, of what we hold valuable. Some of these scenarios are drastic others are subtle. Although all progress is change, not all change is progress. Research effort needs to be invented into understanding these prospects. We need to carefully deliberate how best to reduce risks and expedite beneficial applications (VITA-MORE et al: 2013: pg. 54).**

A discordância principal entre os transumanistas e Jonas reside na avaliação de riscos e na consideração de como evitar o *summum malum*. Enquanto os primeiros preconizam o avanço tecnológico de modo a nos libertarmos da Terra e evitarmos a extinção, Jonas receia que este avanço nos conduza à extinção. O problema é que o receio de Jonas reside na vasta esfera dos cenários possíveis, mas não se trata de algo garantido. Já o receio transumanístico se pauta em uma garantia: sem avanços tecnológicos, todos os cenários possíveis convergem para a extinção. O quinto tópico da *Declaração Transumanista* propõe:

> **Reduction of risks of human extinction, and development of means for the preservation of life and health, the alleviation of grave suffering and the improvement of human foresight and wisdom, be pursued as urgent priorities and generously funded (VITA-MORE et al: 2013: pg. 54).**

Ainda que segundo os transumanistas o modelo ético deva considerar a senciência como um valor intrínseco, não há apego à Terra que possa caracterizar uma ética ecocentrista. Este desapego, longe de representar descaso com o planeta, se pauta no reconhecimento da caducidade de nosso mundo natal. Por isso, a Terra é considerada ponto de partida e não, como em Jonas, destino final.

Tudo considerado, podemos definir o modelo ético transumanístico como zoocêntrico, em contraste ao de Jonas, que é ecocêntrico (o ecocentrismo é um biocentrismo, mas em modalidade geocentrada: *biogeocentrismo*). O ente de valor intrínseco não é nem mesmo o ser inteligente, como pode parecer a um primeiro olhar, mas a *senciência*. Senciência é o imperativo a ser defendido. Tal premissa evoca algumas questões filosóficas clássicas, tais quais: o que é vida? O que é inteligência e como ela difere da senciência? Seria a vida um *telos* cósmico?

Quando se afirma que é imperativo um planejamento de longo prazo capaz de garantir a existência humana além da Terra, a base de tal afirmação não é, como pode parecer à primeira vista, antropocêntrica. Não se trata de advogar em prol da

sobrevivência humana porque *apenas* humanos são dotados de valor intrínseco, mas porque – até o presente momento – apenas humanos possuem recursos intelectuais capazes de tutelar outras formas de vida. Garantir a existência de uma humanidade além da Terra não é garantir *somente* a continuidade da humanidade, mas também a de outras formas de vida tuteláveis, sejam elas já existentes ou emergentes em um possível porvir.

Como exemplo analógico ilustrativo, podemos pensar nos procedimentos tomados quando ocorre despressurização dentro de um avião. Adultos são orientados a colocar as próprias máscaras de oxigênio em primeiro lugar, e só então a repetir o procedimento em crianças. Esta ordem de prioridade se dá porque os adultos são intelectualmente melhor dotados para resolver problemas, não porque possuem maior valor que as crianças. O procedimento oposto incorreria no risco de o tutor perder a consciência, de modo que nem tutor e nem tutelado sobreviveriam. O que se defende aqui é que a inteligência é um instrumento que evoca maior responsabilidade quanto mais incrementado for, mas que por si só não possui valor intrínseco. Estabelecer que apenas a humanidade teria o direito a uma existência estendida por conta de um suposto valor intrínseco exclusivo seria, isso sim, antropocentrismo. O nosso valor intrínseco deriva de nossa consciência, não de nossa forma antropomórfica, tampouco de nossa inteligência superior.

Neste ponto, convém fazer as devidas distinções entre consciência e inteligência, pois é bastante comum que uma coisa seja confundida com a outra. Via de regra, define-se “inteligência” como “capacidade de resolver problemas”. Há espécies mais inteligentes que outras, assim como há humanos mais inteligentes que outros, mas nenhuma filosofia moral digna desse nome pretenderia que pessoas mais inteligentes fossem dotadas de maior valor intrínseco do que indivíduos menos dotados. A inteligência é, portanto, valor *instrumental*, e não há problema moral em afirmar, por exemplo, que o intelecto de Einstein foi instrumentalmente mais valioso do que o do autor desta tese. Entretanto, cabe ressaltar que a inteligência não apenas resolve problemas, mas também os cria. A curiosidade é um atributo da inteligência, e parece haver uma relação de proporcionalidade entre as duas coisas. Dito isso, é inevitável lembrar que a inteligência, fogo prometeico capaz de criar maravilhas, é também capaz de inventar

bombas nucleares. O paradoxo de Fermi[163] questiona o por quê de não termos ainda conseguido contato com espécies extraterrestres inteligentes. Uma possível resposta é a de que tais espécies eram tão inteligentes que a curiosidade as levou a criar ou investigar algum problema perigoso demais, e se destruíram. Por ser um instrumento poderoso, a inteligência e suas criações demandam regulações éticas que não devem estar sujeitas ao mero mercado.

A consciência, por outro lado, é atributo que permite aos seres a capacidade de sentir sofrimento e prazer, evitando o primeiro e desejando o segundo. Um gato, um caracol, uma formiga e um humano são capazes de experimentar sofrimento e prazer, embora no ente humano a alta inteligência (que, como vimos, é capaz de criar problemas) seja a razão pela qual alguém é capaz de se manter vinculado a situações ou elementos que fazem sofrer. Vacas e abelhas, justamente em decorrência de seu curto intelecto, vivem em função dos impulsos básicos de atração e repulsão relativos ao que é prazeroso ou doloroso. Nestes seres, a consciência supera a inteligência. Nos humanos, dá-se o oposto. Um indivíduo envolvido na solução de um complexo problema matemático será capaz de ignorar por um bom tempo os apelos orgânicos da fome, do sono ou de uma eventual dor de coluna, porque a inteligência em nós tende a superar a consciência.

Tudo exposto, a presente tese sustenta que o valor intrínseco decorre da existência da consciência, e não da inteligência. A inteligência humana é capaz de filosofar e debater a respeito do conceito de valor intrínseco, e esta capacidade pode conduzir à percepção equivocada de que é a *razão* que nos torna intrinsicamente preciosos. Contudo, embora um golfinho não possa fazer o mesmo, o animal *sabe* o que é, ao menos para ele, valioso. Ele *sabe*, fisiologicamente falando, o que é bom e ruim para si. Por isso, é importante ressaltar que, se o valor é intrínseco, por definição não há gradações neste valor. A gradação é uma contingência e, portanto, um atributo de valores instrumentais: uma faca pode ser mais ou menos valiosa que outra, um computador pode ser mais ou menos eficiente que outro, e um humano pode ser mais ou menos inteligente que outro. Se não há problema moral algum em afirmar que Einstein é intelectualmente mais valoroso que um indivíduo com retardo mental, seria abominável propor que houvesse, entre eles, diferenças de valor intrínseco.

[163] Enrico Fermi (1901-1954), Italian-American physicist.

Por que, então, a moral humana estabelece distinções de valor entre animais humanos e animais não-humanos? A resposta está no paradigma antropocêntrico, que não apenas confunde consciência com inteligência, como instrumentaliza os animais, como se estes fossem coisas, bens. “Bens semoventes”, conforme estabelece o Direito Civil da maioria dos países ocidentais. Quando exceções se aplicam, ela são sempre culturais: humanizamos cães e gatos, considerando-os “parte da família”, “filhos”, assim como alguns indianos humanizam as vacas, chamando-as de “mães”. Em nenhum caso, o animal tem o valor intrínseco considerado a partir de sua própria natureza, mas sim como uma derivação de nosso olhar humanizador e antropocentrista. Se cães e gatos muitas vezes nos parecem “humanos”, tal percepção constitui equívoco. O que chamamos de “humano” em um cão, é na verdade a porção animal que identificamos em nós mesmos. A ética transumanista rompe com esta lógica. Se gatos e cães merecem tratamento digno em nossa sociedade, por que não vacas, porcos, abelhas, lagostas e ratos? Tratá-los dignamente não significa tratá-los como se humanos fossem, até porque não o são.

Amplas discussões filosóficas podem se dar a partir daí, como, por exemplo, se temos o direito de comer outros animais. De fato, muitos transumanistas como David Pearce[164] em seu *The Hedonistic Imperative*[165] argumentarão que não temos este direito. Mas mesmo os transumanistas não-vegetarianos argumentarão que não temos o direito de causar sofrimento intencional e desnecessário a animal algum, mas que isso não significa que não possamos comê-los, e sim que é antiético maltratá-los. Este é um debate que não cabe à presente tese, mas vale dizer que a tecnologia atual já é capaz de produzir carne sem assassinar animais, a partir da clonagem de células animais específicas[166]. Os custos para criar um mero bife são ainda imensos, mas, partindo do princípio de que a tecnologia tende ao barateamento, talvez seja possível que no futuro sejamos capazes de fazer churrascos sem matar vaca alguma.

Opositores à ideia de um valor intrínseco atribuído a todo ser senciente costumam argumentar que apenas o indivíduo humano pode ser dotado de valor

[164] Filósofo britânico, co-fundador da *World Transhumanist Association*.
[165] Disponível em: https://www.hedweb.com/hedab.htm. Acessado em 11 de março de 2019.
[166] *A closer look at cellular agriculture and the processes defining it*. Disponível em: https://agfundernews.com/closer-look-cellular-agriculture-and-the-processes-defining-it.html. Acessado em 16 de março de 2019.

intrínseco porque somos nós os criadores de tal conceito. O equívoco destes opositores é confundir “coisa” com “palavra”. Uma maçã existe mesmo que eu não a chame de maçã. Formigas são incapazes de explicar ou racionalizar a respeito de valor intrínseco, mas todas elas sabem o que é, para elas, valioso. Elas demonstram entender o que vale e o que não vale, a partir de seus atos. O valor intrínseco é um atributo da coisa viva senciente.

A afirmação precedente nos conduz a uma nova pergunta: o que é uma “coisa viva”? Seguimos, aqui, a definição proposta pela NASA: *Um sistema químico autossustentável capaz de evolução darwiniana* [167]. Um ente artificial poderia corresponder a tais atributos. Eis uma curiosa provocação escrita por Ellery[168]:

> **Ever since Erwin Schrodinger penned his monograph “What is life?” (1944) from the perspective of the physical scientist, physicists and engineers have had an enduring fascination with the biological world. Although the question posed by Schrodinger appears to defy definitive answers, there is nevertheless substantial agreement on the fundamental properties of life: (i) the ability to self-replicate; (ii) metabolism and growth powered through the ingestion of matter and energy; (iii) cellular encapsulation from the environment; and (iv) the capacity to evolve and adapt to the environment. In fact, this could be reduced to the first three properties because the fourth is derivative from the first two properties through the second law of thermodynamics. Artificial life emphasises exploration of this fourth property of evolution. Unlike synthetic biology in which biological components are configured into engineering functions, we are configuring engineering components into a form of artificial life, not in software but in hardware. We are developing a self- replicating machine. (…) We are using robotics as existence proofs for physical mechanisms of self-replication – a similar approach of using robotics has been used in cognitive robotics and robotic zoology. So, can building an artificial robotic lifeform using engineering materials provide any insight into the astrobiology quest – to understand the limits and scope of life beyond the Earth? I shall leave it to the astrobiology community to decide but it is worth noting that our artificial creature possesses the three properties of life (ELLERY: 2016: pg. 67-68).**

Imaginemos, portanto, um ser sintético autossuficiente, capaz de se reproduzir e de se adaptar ao ambiente. Estaria ele vivo? Pela definição da NASA, sim. Seria inteligente? Sim. Talvez até mais inteligente que o mais inteligente dos humanos. Mas estaria ele *consciente*? Esta é uma boa questão, para a qual não se tem resposta científica e constitui, portanto, um problema filosófico sobre o qual somente podemos hipotetizar. Se esta entidade, por todas as suas peculiaridades, não evita o sofrimento, não busca o prazer e se reproduz tão somente pelos

[167] Disponível em: https://astrobiology.nasa.gov/research/life-detection/about/. Acessado em 22 de fevereiro de 2019.
[168] Alex Ellery, engenheiro canadense e professor associado na Universidade Carleton.

imperativos de sua programação, como podemos dizer que seja algo mais do que um instrumento impressionante? Um computador é capaz de resolver problemas matemáticos de alta complexidade, mas não é possível dizer que esteja consciente, tampouco vivo.

Eis algumas questões filosóficas que se põem: (1) será que a consciência depende da imperfeição inerente aos corpos orgânicos? Seres que não sentem dor e nem prazer, mas que são inteligentes, poderiam ser considerados intrinsicamente valiosos? Ou seriam apenas instrumentos altamente sofisticados? (2) será possível que a consciência emerja a partir de determinado grau de inteligência, mesmo em um organismo sintético? É uma questão curiosa, pois equivale a dizer que algo intrínseco nasce de algo instrumental, e portanto a contingência antecede a essência. Na natureza, o que se verifica é o oposto: a consciência (valor intrínseco) se manifesta primeiro, mesmo nos seres mais primitivos, como parte inseparável de toda vida. Por sua vez, a inteligência (valor instrumental) emerge em seguida, em gradações relacionadas ao grau de complexidade do ente.

Especulações à parte, o que temos é a certeza de que, até o presente momento, a espécie humana é a única dotada de inteligência capaz de garantir a existência da vida quando a Terra e o sistema solar não forem mais viáveis. Projetos tecnológicos que por ora soam como ficção científica são bastante factíveis, como, por exemplo, a terraformação de outros mundos e a criação de novas formas de vida (biológicas ou sintéticas) nesses contextos alienígenas; a criação de estações espaciais autônomas; um banco de dados genético capaz de trazer de volta espécies que foram extintas não pelo curso da natureza, mas pela ação desastrada e antiecológica de nossos contemporâneos e ancestrais; um eventual aperfeiçoamento genético capaz de permitir nossa adaptação a contextos alienígenas. Esta última possibilidade é a eticamente mais discutível, e o trauma do ideário eugênico dos nazistas é recente demais para não sentirmos profundo mal estar diante da ideia do melhoramento genético humano. Contudo, devemos encarar o fato de que o futuro exigirá que nos adaptemos a contextos extraterrestres, caso tenhamos a intenção de sobreviver enquanto espécie. Os aperfeiçoamentos corporais necessários podem ser cautelosamente estudados desde já, caso contrário teremos de fazer tudo às pressas quando a necessidade se fizer real.

Dentre os modelos bioéticos, o único que se opõe totalmente a quaisquer projetos de expansão humana espacial é o cosmocentrismo, também conhecido

como “preservacionismo cósmico”. É a teoria ética ambiental contrária à ideia de que valores terrestres devam ser impostos a contextos alienígenas. O princípio sustentador do pensamento cosmocentrista parte da premissa de que existe algo de singular em ambientes alienígenas, e que esta singularidade deve ser preservada. A ética cosmocêntrica é não-utilitarista, justamente por considerar o valor intrínseco como *inerente à existência em si*, o que obviamente inclui coisas inanimadas, tais quais rochas marcianas. Conforme explica Fogg[169], a respeito dos cosmocentristas:

> **The Cosmos has its own values, they claim, and its mere existence gives it not only the right to exist, but the right to be preserved from any human intent. Such a moral principle we might call the Principle of the Sanctity of Existence, with uniqueness as its basis of intrinsic value. Moral behavior under such a system would involve non-violation of the extraterrestrial environment and the preservation of its existence state (FOGG: 1999: pg. 6).**

Levando em conta a ética promulgada pelos cosmocentristas, seria correto afirmar que o preservacionismo é incompatível com o primeiro ponto do manifesto transumanista, especialmente no trecho que defende a superação do confinamento humano ao planeta Terra. Ainda conforme Fogg:

> **In the absence of extraterrestrial life, only preservationism concludes that space settlement would be immoral if it was seen to be to the benefit of terrestrial life (FOGG: 1999: pg. 1).**

Na perspectiva transumanista, que é zoocentrista, seria admissível realizar intervenções planetárias, *contanto que* em ambientes alienígenas nos quais correntemente não há vida; *contanto que* de modo a ajudar que um ambiente prebiótico se torne biótico; e *contanto que* tais intervenções protegessem eventuais planetas vivos contra eventos de extinção. Conforme argumenta Wilks[170], a partir de uma perspectiva tipicamente biocentrista:

> **(...) I am merely arguing that our moral obligations to them[171] ought to be determined in consideration of the intrinsic value of other living beings – especially those possessing greater intrinsic value. Furthermore, given that, on this view, all life forms have intrinsic value, and that life has value and priority over non-life. I agree with Christopher McKay that it is morally permissible to undertake technological endeavours both (a) to protect and promote the**

[169] Martyn J. Fogg (Nascimento: 1960), físico e geólogo britânico, doutor em ciências planetárias.
[170] Anna Frammartino Wilks, doutora em filosofia pela *University of Toronto*.
[171] Micróbios.

> **survival, richness and diversity of indigenous, extraterrestrial life forms on other planets, and also (b) to create an extraterrestrial biosphere that could generate and sustain life on planets that do not currently have life (…) (WILKS: 2016: pg. 192-193).**

Intervenção é um objetivo transumanista forte, de fato. O princípio ético cosmocêntrico parte do pressuposto de que todas as coisas existentes, sejam elas vivas ou não, têm o direito de ser tal quais são, a partir de uma construção espontânea. Isso implica afirmar que a rochas lunares ou argilas marcianas, por exemplo, possuem o direito cósmico de serem o que são. Haveria, por assim dizer, um *ethos* anterior à humanidade, que independe de nossa existência e, portanto, a transcende. Cosmocentristas advogam que as políticas espaciais humanas deveriam estabelecer interditos totais no que tange à exploração espacial, ainda que os sítios alienígenas nada tenham além de rochas. Afinal, conforme diz Marshall[172]:

> **If Mars, or any other planetary body, is devoid of life, it does not follow that it is devoid of value beyond any resources it may have that are useful to humans. An extension of human ethics to animals and thence to other organisms if taken to the next step would include an extension of ethics to abiotic objects (be they rocks, rivers or ringed planets) even if they do not contribute to a living ecosystem. Although it (N.A.: Mars) might seem to be a great useless hunk of red rock to us, human could, in the view of Martian rocks, me merely living organisms who are yet to attain the blissful state of satori only afforded to non-living entities. (…) We must not consider Mars or any other celestial body to be unlucky just because it does not support life. Indeed, even in the absence of indigenous lifeform, Mars possesses its own uniqueness and diversity, which are worthy to respect (MARSHALL: 1993: pg. 227-236).**

Em contraposição aos cosmocentristas, Fogg argumenta que:

> **(…) whilst it is reasonable to propose that animals with advanced nervous systems might have feelings, and therefore a point of view, surely it is gross sentimentality to propose such a thing for rocks. After all, a sentimental terraforming enthusiast might propose that, far from the rocks on Mars existing in a state of "blissful satori" (as a preservationist would have it) they might instead be "crying out for life." Both arguments are unedifying. Rocks don't think, don't act and don't care. They cannot have values of their own (FOGG: 1999: pg. 7).**

O modelo bioético transumanista é, portanto, fortemente contrário a quaisquer idealizações cosmocêntricas. Isto não nos autoriza a agir irresponsavelmente em mundos alienígenas, visto que eles constituem elementos de significativo valor

[172] Alan Marshall, pesquisador neozelandês em estudos ambientais, doutor pela *University of Wollongong*.

instrumental. Mas é preciso ter em mente que rejeitar a ideia de expandir nossa existência além da Terra é flertar com o suicídio coletivo.

Conforme visto na apresentação prévia desta tese, ambientes extraterrestres como lugares exploráveis e colonizáveis têm ocupado o pensamento humano desde quando Galileu Galilei dessacralizou o mundo supralunar, convertendo-o em *lugar*. Mesmo com todas as evidências, contudo, a humanidade se mantém contrária à ideia de colonizar o céu como se ele fosse um lugar sagrado. Conforme Foucault:

> **Now, despite all the techniques for appropriating space, despite the whole network of knowledge that enables us to delimit or to formalize it, contemporary space is perhaps still not entirely desanctified (apparently unlike time, it would seem, which was detached from the sacred in the nineteenth century). To be sure a certain theoretical desanctification of space (the one signaled by Galileo's work) has occurred, but we may still not have reached the point of a practical desanctification of space. And perhaps our life is still governed by a certain number of oppositions that remain inviolable, that our institutions and practices have not yet dared to break down. These are oppositions that we regard as simple givens: for example between private space and public space, between family space and social space, between cultural space and useful space, between the space of leisure and that of work. All these are still nurtured by the hidden presence of the sacred.**[173]

Ainda pensamos em Terra e Cosmos como coisas separadas, como se este último fosse uma espécie de zona sacra, impenetrável, cujo acesso nos é total ou parcialmente vetado. É essa sacralização ainda vigente no pensamento humano que fundamenta retóricas contrárias à pesquisa espacial com argumentos de ordem de importância econômica, religiosa ou científica. O cidadão médio não reconhece o valor da pesquisa espacial e tende a julgar tais investimentos como um desperdício de recursos. Uma pesquisa de percepção social encomendada pela NASA em 2004 conclui que:

> **NASA does not have a branding problem; it has a communication problem, in that people do not understand the connection between the NASA brand and its current activities. While NASA has many stories to tell about their accomplishments, people don't have the scientific training to evaluate their technical importance within the brand. (…) when asked to judge between two competing arguments in which they have little or no expertise, people will default to the more compelling vision. NASA is not currently communicating a compelling overarching vision that reflects their brand in the minds of the public. (…) Today American society seems to have returned to the attitudes of the mid 1950s. The public believes manned space flight to Mars and other**

[173] FOUCAULT, M. *Of Other Spaces.* Disponível em: http://web.mit.edu/allanmc/www/foucault1.pdf. Acessado em 22 de fevereiro de 2019. Traduzido do francês para o ingles por Jay Miskowiec.

planets is possible. But they don't believe the government should billions of dollars to do it.[174]

A resistência social ao investimento em exploração espacial pode ser entendida considerando o fato de que, a despeito de o cérebro humano ser altamente desenvolvido, não é tão diferente do cérebro de nossos ancestrais pré-históricos. A seleção natural foi vencida por aqueles suficientemente bons para avaliar eventos de prazo curto e obter satisfação imediata na forma de parcerias promissoras, alimento e água. Ainda que se saiba que é necessário poupar para a velhice ou para a educação dos filhos, a tendência do cidadão médio é a de gastar mais do que deveria, como se não houvesse um amanhã. O comportamento imediatista observado em indivíduos encontra o seu reflexo ampliado em um padrão bastante similar não apenas na política dos governos, como na política das empresas privadas. A exploração espacial é considerada "frívola" por não oferecer uma satisfação que seja identificada como imediata. Entretanto, como exemplo ilustrativo da falha cognitiva de nosso cérebro para fazer julgamentos eficientes sobre o que é valioso, eis o orçamento anual da NASA em 2004 em comparação com os gastos dos cidadãos norte-americanos com álcool, tabaco e *junkie food*[175]:

Categoria	**Gasto total (média de dez anos em dólares americanos)**
Orçamento da NASA	16 bilhões
Venda de *junkie food*	110 bilhões
Álcool e tabaco	170 bilhões
Jogos de azar legalizados	350 bilhões

Apesar de nossa resistência coletiva à ideia de uma expansão espacial pós-humana, nós somos potenciais construtores de mundos, capazes de estabelecer planos éticos que permitam à vida manter sua existência e até mesmo florescer em outros mundos. E nós, como "mestres deste mundo", somos dotados com poderes

[174] *American Perception of Space Exploration: A Cultural Analysis for Harmonic International and The National Aeronautics and Space Administration*. Washington: 2004. Disponível em: http://www.hq.nasa.gov/office/hqlibrary/documents/o55201537.pdf. Acessado em 22 de fevereiro de 2019.
[175] Idem.

notáveis e incrível tecnologia. Nós podemos destruir tudo, nós podemos fingir que a Terra é uma pérola azul eterna, ou nós podemos assumir a proteção de nosso mundo e da existência como um dever moral. Nós podemos até mesmo assegurar que outros mundos floresçam com vida. Conforme o quinto tópico da *Declaração Transumanista* diz,

> **(…) reduction of risks of human extinction and development of means for the preservation of life and health, the alleviation of grave suffering and the improvement of human foresight and wisdom, must be pursued as urgent priorities and generously funded (VITA-MORE et al: 2013: pg. 54).**

Nosso potencial ainda está longe de ser realizado. Nós deveríamos urgentemente pensar sobre quais são os nossos deveres como seres racionais. Assim como a Criança-Estrela ficcional de Clarke em *2001 – Uma Odisséia no Espaço*, nós estamos olhando para nosso próprio planeta com fascinação, e o poder da vida e da morte, criação e destruição, *eros* e *thanatos* jaz em nossas mãos. Gerações futuras dependem de nossa urgente expansão espacial. Por enquanto, nosso *ethos* se baseia em esperança, nós estamos brincando com o pensamento desejoso de que nossa existência é especial, protegida, garantida. Nós acreditamos fortemente que há um superpai cósmico que cuida de nós. Talvez exista de fato, mas conforme nós iremos discutir no próximo capítulo, e se Deus sacrificou Seu poder de modo a permitir nossa existência? E se for Ele quem depende de nós em vez de nós dependermos Dele? Estas são as questões sobre as quais a presente tese se debruça no próximo capítulo.

2. Metafísica: a emergência de uma consciência cósmica.

Thermodynamic miracles... events with odds against so astronomical they're effectively impossible, like oxygen spontaneously becoming gold. I long to observe such a thing. And yet, in each human coupling, a thousand million sperm vie for a single egg. Multiply those odds by countless generations, against the odds of your ancestors being alive. Meeting. Siring this precise son, that exact daughter, until your mother loves a man she has every reason to hate, and of that union, of the thousand million children competing for fertilization, it was you, only you, that emerged. To distill so specific a form from that chaos of improbability, like turning air to gold... that is the crowning unlikelihood. The thermodynamic miracle. (…) But the world is so full of people, so crowded with these miracles that they become commonplace and we forget. We gaze continually at the world and it grows dull in our perceptions. Yet seen from another's vantage point, as if new, it may still take our breath away. Come... dry your eyes. For you are life, rarer than a quark and unpredictable beyond the dreams of Heisenberg. The clay in which the forces that shape all things leave their fingerprints most clearly. Dry your eyes... and let's go home[176]*.*

2.1. Transumanismo e metafísica: considerações iniciais.

O presente capítulo expõe algumas hipóteses metafísicas cuja pretensão é servir de sustentação para a proposta ética de expansão biocósmica apresentada nesta tese. O questionamento do qual partimos é: *em havendo um telos cósmico, qual o papel da humanidade neste suposto projeto?*

Antes de tudo, cabe observar que a ética não prescinde necessariamente de uma metafísica, como bem demonstra, por exemplo, Hume[177]. O fato de afirmar, por exemplo, que

> **(…) If we take in our hand any volume of divinity or school metaphysics, for instance; let us ask, *does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of act and existence?* No. Commit it then to the flames: For it can contain nothing but sophistry and illusion (HUME: 2003: pg. 222).**

não impediu Hume de investigar os princípios da moral. Por outro lado, sistemas ou verdades metafísicas conduzem necessariamente a específicos modelos éticos. O que se pretende aqui é apresentar um sistema hipotético que, por suas características metafísicas, conduz ao modelo ético sustentado como tese: a *ética do des-espero* e o imperativo da expansão biocósmica.

Seria possível, é bem verdade, defender tal modelo sem as considerações descritas no presente capítulo. A ética do movimento transumanista não costuma se sustentar a partir de bases metafísicas, limitando-se em geral a questionamentos

[176] Doctor Manhattan, em: *Watchmen*, revista em quadrinhos de 1987, de Alan Moore.
[177] David Home (1711-1776), mais conhecido como David Hume, filósofo escocês.

acerca da ontologia do tipo humano. Contudo, defender um modelo ético pautado na oposição a uma clássica virtude teologal (a esperança), que é o que aqui se propõe, envolve necessariamente contestar algumas verdades metafísicas estabelecidas pelas principais religiões monoteístas. Em todos os casos e de diferentes formas, a esperança serve de esteio para que se possam suportar os sofrimentos da existência. Como, por exemplo, a esperança na vinda do messias (judaísmo), ou mesmo a esperança na vida eterna no Paraíso (cristianismo). Advogar em prol da ética do des-espero no lugar da ética da esperança é empreendimento melhor realizado, conforme se verá, a partir de considerações cosmológicas (ou mesmo cosmogônicas, conforme propõe Jonas), e tais considerações demandam proposições de ordem metafísica.

Vale dizer que, embora transumanistas em geral rejeitem dogmas religiosos, há os que compatibilizam transumanismo e fé. Conforme aponta More:

> **The content of some religious beliefs is easier to reconcile with transhumanism than the content of others. Christian transhumanists, while not completely unknown, are very rare (…). There are more Mormon transhumanists (although some of these are cultural rather than religious Mormons), perhaps because that religion allows for humans to ascend to a higher, more godlike level, rather than sharply dividing God from man. Several transhumanists describe themselves as Buddhists (presumably of the secular, philosophical type), and there seem to be few obstacles to combining transhumanism with liberal Judaism. However, the vast majority of transhumanists do not identify with any religion. A pilot study published in 2005 found that religious attitudes were negatively correlated with acceptance of transhumanism ideas. Those with strong religious views tended to regard transhumanism as competing with their beliefs (Bainbridge 2005) (MORE: 2013: pg. 8).**

A despeito de o movimento transumanista ser mais inclinado ao materialismo, ao fisicalismo e ao funcionalismo, tal inclinação não torna o movimento refratário a questões supra-empíricas. Talvez a hipótese metafísica mais recorrente entre transumanistas seja, conforme aponta More,

> **(...) the idea of the world as simulation. As computers have become ever more powerful, simulations for both scientific and ludic purposes have proliferated and rapidly grown in sophistication. Although humans have always lived their lives entirely in the physical world as revealed by the unmediated senses, we may come to spend much of our time in simulation environments, or in "real" environments with virtual overlays. Simulated worlds raise questions about what we value. For instance, we do value the experience of achieving something or *actually* achieving it, and how clear is the distinction (Nozick 1974)? Taking this line of thinking further, transhumanists from Hans Moravec to Nick Bostrom have asked how likely it is that we are *already* living in a simulation (Moravec 1989; Bostrom 2003) (MORE: 2013: pg. 8).**

Entretanto, acreditar no mundo como uma simulação virtual apenas desloca a existência de uma "realidade". Se vivemos em um mundo virtual, nada impede que haja realidade em algum lugar. A não ser que, partindo de pressupostos budistas, todos os mundos sejam simulações e não haja algo como uma "realidade".

Mas há uma questão metafísica importante na história da filosofia que tende a ser indevidamente subestimada pelo movimento transumanista. A questão é: nosso universo possui um *telos*? O que se pretende aqui é argumentar que *se* o sistema metafísico proposto estiver correto, a *inescapável responsabilidade* de que nos fala Huxley tem um papel fundamental na realização deste *telos*, dado que essa suposta finalidade cósmica não é *garantida por si*, embora tenha suas chances aumentadas tanto pela vastidão do espaço quanto pelo provável desdobramento do universo em múltiplas possibilidades quânticas.

A fim de reduzir o risco de mal entendidos, é fundamental que, antes de abordarmos tais questões, façamos a devida distinção entre *sistemas* metafísicos e *verdades* metafísicas. Tratam-se de coisas diferentes. E o que se pretende aqui é a sustentação de *sistemas*, não a declaração de *verdades*.

2.2. Sistemas e verdades.

Duhem[178] dispõe o estudo da física (ou seja, das *coisas*[179]) como logicamente precedente ao da metafísica (ou seja, das *causas*). Esta divisão, conforme bem alerta Duhem, não corresponde à estabelecida pela peripatética, dado que, para os peripatéticos, os movimentos e modificações das coisas fazem parte da física. Estes mesmos movimentos, para Duhem, são objeto de estudo da cosmologia, que, para o filósofo, é parte constituinte do conjunto ao qual se dá o nome de "metafísica" (DUHEM: 1996: pg. 30). Respeitar essa ordem lógica, na qual a física necessariamente precede a metafísica, permite que explicações sejam obtidas a partir da observação de fenômenos. No caso inverso, é a realidade que precisa se

[178] Pierre Maurice Marie Duhem (1861-1916), físico francês e filósofo da ciência.
[179] *Coisas* são consideradas em três fases: a observação dos fatos; a descoberta de leis; e a construção de teorias (DUHEM: 1996: pg. 30).

ajustar a uma explicação, nem que para isso seja necessário salvar as aparências quando o mundo das coisas insiste em contrariar o credo metafísico[180].

Não que seja impossível compreender a física a partir da metafísica. O problema é que tal procedimento incorre no risco de sérios erros. Um dos erros principais está em estabelecer uma relação monocausal, onde "A" causa "B". Ainda que "A" cause *necessariamente* "B" - e o entendimento pleno das causas permite o entendimento pleno dos efeitos -, o conhecimento do efeito "B" não permite garantir que "A" tenha sido *necessariamente* sua causa. Os mesmos efeitos podem ser produzidos por causas outras. Os limites do entendimento humano nos permitem, no máximo, um conhecimento imperfeito da razão de ser das coisas (DUHEM: 1996: pg. 43-44). E, por isso, é fundamental distinguir *sistemas* metafísicos de *verdades* metafísicas. As verdades metafísicas consistem, segundo Duhem:

> **(...) a very incomplete and imperfect knowledge of the essence of material things. This knowledge proceeds more through negation than through affirmation, more by the exclusion of some hypotheses that might be made about the nature of things than by positive indications of that nature (...) To understand this essential point properly, it is important never to confuse the *truths established by metaphysics* with *metaphysical systems*. The truths of metaphysics are propositions few in number and, for the most part, negative in form, which we obtain in ascending from observed phenomena to the substances which cause them (DUHEM: 1996: pg. 33).**

Um sistema metafísico, por sua vez,

> **(...) is a collection of positive judgements – although hypothetical for the most part – by means of which a philosopher seeks to relate metaphysical truths among themselves in a logical and harmonious order. Such a system is acceptable provided none of the hypotheses composing its conflicts with an established metaphysical truth. But it remains always highly problematic and never forces itself on reason in an unavoidable fashion (DUHEM: 1996: pg. 33).**

Estabelecida a distinção, cabe dizer que todas as considerações apresentadas nesta tese constituem, portanto, *sistemas* metafísicos, jamais verdades, estando em sintonia com a cautela de Jonas ao se referir a uma de suas

[180] Como, por exemplo, partir da verdade metafísica de que o mundo supralunar é imutável e eterno e que, portanto, estrelas cadentes só podem ser fenômenos atmosféricos. Ou mesmo quando atribuíram as inesperadas imperfeições da superfície lunar às lentes sujas do telescópio de Galileu. Não importa o quanto a realidade contrarie a verdade metafísica, é a realidade que termina sendo negada, ou mesmo "ajustada" para que o teor da verdade seja salvo.

obras não como “verdade”, mas como *suposição cosmogônica*[181]. Ressalte-se que, ainda que Duhem preconize uma radical separação entre física e metafísica, alertando para o fato de que misturar as duas áreas seria dar ganho de causa do positivismo (DUHEM: 1996: pg. 34-38), uma exceção é aberta: *quando as hipóteses metafísicas concernem a questões astronômicas*. Conforme Duhem:

> **On the subject of the relations between physics and metaphysics, Aristotle and the peripatetic philosophy admitted a thesis which essentially agrees with the one we have developed. They made little use of it <u>except in astronomy</u>, the only branch of physics which was developed at that period, but what they said about the motion of the stars can be extended readily to other natural phenomena (DUHEM: 1996: p. 40).**

A título de exemplo da admissibilidade das hipóteses apresentadas por sistemas metafísicos em contextos astronômicos, Duhem bem recorda o caso de Copérnico que, em seu livro *Revolutions*, fez acrescentar um resumo intitulado *A Little Book of Nicolas Copernicus on the hypotheses of the celestial motions put together by him*[182]. Ressalte-se a forma como Copérnico se dirige ao leitor: *if our different assumptions, called axioms, are admitted*[183] (COPERNICO: 1984: pg. 9).

O que Copérnico propunha era uma *explicação-outra* para a ordenação celeste. Ele não tinha condições de demonstrar seu modelo empiricamente, e as explicações dadas pelo modelo ptolomaico eram bastante satisfatórias. A diferença fulcral entre os modelos, no sentido de vantagem para o copernicano sobre o ptolomaico, é que o primeiro se revela mais elegante e tem necessidade de menos elementos explicativos do que o segundo[184]. Ou seja, entre duas hipóteses que igualmente explicam um dado fenômeno, dá-se preferência àquela que for mais econômica em termos de entidades necessárias para a própria sustentação. Este princípio da restrição de entidades não *garante* que a explicação mais econômica seja a verdadeira, o que não constitui um problema, dado que hipóteses metafísicas não têm por objetivo a certeza de suas afirmações. São exercícios do pensamento.

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[181] Em seu livro *Materie, Geist und Schöpfung. Kosmologischer Befund und Kosmogonische Vermutung*.

[182] Esta apresentação é conhecida como *Commentariolus*.

[183] Do original em latim: *si nobis aliquae petitiones, quas axiomata vocant, concedantur*. Tradução livre minha.

[184] Para que a Terra seja aceitável como centro do sistema ao invés do Sol, é necessário o estabelecimento de epiciclos e deferentes, de modo a explicar os movimentos retrógrados aparentes dos planetas em relação ao observador terrestre. No caso do Sol como centro, as entidades “epiciclos” e “deferentes” se tornam desnecessárias para justificar as retrogradações.

Em suma, há duas considerações importantes a respeitar para o devido entendimento deste capítulo. A primeira delas é a de que é extremamente difícil, até mesmo imprudente e pretensioso, explicar o universo a partir de *verdades* metafísicas. O conhecimento físico, conforme sustenta Duhem, se elabora a partir do método experimental/observacional, que, por sua vez, independe da metafísica. Essa independência é, sobretudo, uma necessidade que se impõe em decorrência da limitação auto-evidente da inteligência humana. Qualquer um que se arvore a mesclar a física com a metafísica está a evocar para si uma inteligência angélica. Conforme diz Duhem:

> **(...) An intellect which had a direct intuitive view of the essence of things – such as, according to the teaching of the theologians, an angel's intellect – would not make any distinction between physics and metaphysics; such an intellect would not know successively the phenomena and the substance – that is, the cause of these phenomena. It would know substance and its modifications simultaneously. It would be much the same for an intellect that had no direct intuition of the essence of things, but an adequate – though indirect – view through a beatific vision of divine thought (DUHEM: 1996: pg. 31-32).**

A segunda consideração sustenta a importância de não confundir, aqui, *verdade* com *sistema*. Dito isso, cabe ressaltar mais uma vez que em nenhum momento da presente tese se pretende afirmar uma *verdade metafísica*. O que se pretende é defender um *sistema* a partir da mesma cautela copernicana e jonasiana. "Admitamos que" e "suponhamos que" é totalmente distinto de "afirmamos que". E, para realizar a defesa desse sistema, é importante considerar o que deve vir primeiro de acordo com a ordem lógica: *as coisas físicas*. Qualquer procedimento inverso ao ora exposto assumiria uma conformação não de filosofia, mas de teosofia, na forma de uma verdade revelada.

Sigamos, portanto, para as hipóteses que sustentam o sistema metafísico da presente tese:

2.3. Vida, senciência e inteligência: há um *telos* cósmico?

A humanidade se pergunta, ao longo dos séculos e das mais diferentes formas, se o universo possui ou não uma *entelekheia*. A enteléquia, conforme concebida por Aristóteles, é uma qualidade possível a todas as coisas existentes, inclusive as inanimadas, e representa um processo transformativo no qual a potência de algo se realiza em ato. Tal conceito se contrapõe à filosofia platônica,

que situava no exterior (o “mundo das ideias”) a causa do desenvolvimento das coisas.

Entretanto, se é possível sustentar com facilidade a ideia de que, por exemplo, uma semente de pêssego tem como *telos* o desenvolvimento de um pessegueiro, e que esta árvore plenamente formada é a enteléquia da semente que a originou, aplicar a mesma analogia ao universo é tarefa difícil e polêmica. Um pessegueiro, causa final da semente de pêssego, depende de tempo e espaço para se realizar. Em solo inadequado, ou se jamais semeada, a semente será para sempre uma árvore em potência, mas não em ato. Deste modo, é possível dizer que a causa final de uma semente não se realizou por falta de um lugar adequado. Mesmo assim, podemos conhecer sua enteléquia a partir de uma semente de mesma natureza, que, por sua vez, foi devidamente semeada. Toda potência demanda *topos* (lugar), *cronos* (tempo) e muitas vezes *kairós* (momento oportuno) para se realizar em ato.

Temos, então, o primeiro problema: ao contrário de sementes ou quaisquer outras coisas existentes passíveis de serem comparadas de modo a verificar a diferença entre potência dormente e ato, até o momento não temos como comparar nosso universo com outro. Além disso, o universo não depende do contexto do tempo e do espaço. Ele *é* o tempo e o espaço onde as potências se realizam, portanto afirmar que os elementos emergentes no conjunto do universo constituem finalidade tende a ser encarado pelos positivistas como uma sofisticada tautologia. Ainda assim, em diversas ocasiões na história da filosofia, a afirmação de que o universo possui uma finalidade foi sustentada das mais diferentes formas, e todas elas guardam como ponto em comum o chamado argumento teleológico. Tal argumento sustenta a existência de uma qualidade ordenadora conhecida por vários nomes: *força*, *inteligência, Deus*. Todavia, a despeito de terem em comum a hipótese de um *telos*, esses nomes não devem ser entendidos como sinônimos. “Força” tem um significado muito próprio com implicações distintas de “inteligência”, por exemplo. O conceito de “força” não implica necessariamente “inteligência” (ação intencional), muito menos “bondade”. É possível defender que o universo tem um *telos* sem crer, por exemplo, que ele atende às nossas preces.

A ideia de que a emergência da vida é um imperativo ou uma finalidade cósmica deriva de uma sustentação teleológica bastante elaborada, embora existam diferentes formas de teleologia. O argumento físico-teleológico em sua forma mais

ingênua evoca elementos tais quais a beleza de uma flor, a simetria da natureza, além de todas as coisas que a percepção humana entende como "agradáveis" e que, portanto, teriam sido supostamente criadas por um *designer* inteligente. A forma ingênua do argumento teleológico é, portanto, marcada por um viés flagrantemente antropocêntrico. Por outro lado, a teleologia cósmica em sua forma não-antropocêntrica explora evidências de que o nosso universo é estruturalmente biofílico, ou seja, favorável ao surgimento da vida. A forma da vida seria contingente, mas sua existência seria necessária. Ou seja: ainda que a vida seja uma inevitabilidade cósmica, não há garantia alguma de que perdure, ou mesmo que evolua rumo à consciência e à inteligência.

Entre transumanistas, é possível encontrar defensores da hipótese de que não apenas a vida, mas a mente e a inteligência constituem finalidade cósmica. Após o supostamente inevitável surgimento de seres conscientes (humanos, alienígenas ou entidades artificialmente criadas), tais seres contaminariam o cosmo com inteligência, até que todo o universo despertasse e pudesse gerar intencionalmente novos universos-bebês. Esse tipo de crença, ou aposta, é encontrado em autores tais quais Gardner[185], cuja principal tese se refere a uma mente cósmica emergente:

> **The hypothesis of selfish biocosm asserts that the anthropic qualities which our universe exhibits might be explained as incidental consequences of a cosmic replication cycle in which the emergence of a cosmologically extended biosphere could conceivably supply two[186] of the logically essential elements of self-replication identified by the mathematician and computer pioneer John von Neumann. Furthermore, the hypothesis implies that the emergence of life and intelligence are key epigenetic thresholds in the cosmic replication cycle, strongly favored by the physical laws and constants which prevail in our particular universe (GARDNER: 2007: pg. 170-171).**

Em outro artigo similar, Gardner diz:

> **The central assertions of the SB[187] hypothesis are: (1) that highly evolved life and intelligence play an essential role in a hypothesized process of cosmic replication and (2) that the peculiarly life-friendly laws and physical constants that prevail in our universe—an extraordinarily improbable ensemble that Pagels dubbed the cosmic code (Pagels, 1983) — play a cosmological role functionally equivalent to that of DNA in an earthly organism: they provide a recipe for cosmic ontogeny and a blueprint for cosmic reproduction. Thus, a key retrodiction of the SB hypothesis is that the suite of physical laws and**

[185] James N. Gardner (nascido em 1946), escritor norte-americano e teórico da complexidade, autor de *The Biocosm Hypothesis*.
[186] Estes "dois elementos logicamente essenciais" são um controlador e um dispositivo de duplicação.
[187] Biocosmo egoísta.

> **constants that prevail in our cosmos will, in fact, be life-friendly. Moreover — and alone among the various cosmological scenarios offered to explain the phenomenon of a bio-friendly universe — the SB hypothesis implies that this suite of laws and constants comprise a robust program that will reliably generate life and advanced intelligence just as the DNA of a particular species constitutes a robust program that will reliably generate individual organisms that are members of that particular species[188].**

As hipóteses de Gardner trazem à mente uma das mais significativas obras de Chardin[189], cujo pensamento exposto em *The Phenomenon of Man* permite classificá-lo como um proto-transumanista. A despeito das diferenças de abordagem, Gardner e Chardin têm em comum (1) a convicção de que a emergência da consciência constitui causa final do cosmo; (2) um otimismo no que diz respeito à transformação dessa potência em ato. Em apertada síntese, podemos dizer que Chardin propõe uma ortogênese, isto é, a ideia de que a evolução ocorre de modo unidirecional rumo a um suposto "ponto ômega", onde todas as consciências se reunirão a Cristo. Não surpreende constatar que é o próprio Julian Huxley, primeiro a evocar o termo "transumanismo" no século XX, o autor da introdução da mais conhecida edição do *Phenomenon*:

> **The different branches of science combine to demonstrate that the universe in its entirety must be regarded as one gigantic process, a process of becoming, of attaining new levels of existence and organisation, which can properly be called a genesis or an evolution. For this reason, he[190] uses words like *noogenesis*, to mean the gradual evolution of mind or mental properties, and repeatedly stresses that we should no longer speak of a cosmology but of a cosmogenesis. Similarly, he likes to use a pregnant term like *hominisation* to denote the process by which the original proto-human stock became (and is still becoming) more truly human, the process by which potential man realised more and more of his possibilities. Indeed, he extends this evolutionary terminology by employing terms like *ultra-hominisation* to denote the deducible future stage of the process in which man will have so far transcended himself as to demand some new appellation (HUXLEY: 1947: pg. 12).**

Não obstante a presente tese esteja de acordo com *a hipótese de que a emergência da vida constitua uma forte tendência cósmica em nosso universo*, o otimismo evolutivo de Chardin e Gardner não se sustenta aqui. Neste sentido, a maior afinidade demanda que se exponham as advertências de Jonas:

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[188] Originalmente publicado em maio de 2005 no *The International Journal of Astrobiology*. Republicado em 28 de fevereiro de 2006 em http://www.kurzweilai.net/the-physical-constants-as-biosignature-an-anthropic-retrodiction-of-the-selfish-biocosm-hypothesis. Acessado em 16 de dezembro de 2018.

[189] Pierre Teilhard de Chardin (1881-1955), filósofo francês e padre jesuíta.

[190] A reference to Chardin.

> **The reader will, however, find nothing here of the evolutionary optimism of a Teilhard de Chardin, with life's sure and majestic march toward a sublime consummation. He will find life viewed as an experiment with mounting stakes and risks which in the fateful freedom of man may end in disaster as well as in success. And the difference from Chardin's as also from other, and better conceived, metaphysical success will, I hope, be recognized as one not merely of temperament but of philosophical justness (JONAS: 2001: XXIV).**

Ainda que rejeitemos as garantias oferecidas pela tese de Chardin, é inevitável que se tenha de lidar com a radical rejeição teleológica estabelecida pelo método científico desde o século XVII. Tal rejeição, vale ressaltar, diz respeito menos à ideia de causas finais, e mais ao que se entende como a fantasia antropocêntrica alimentada pelas grandes religiões monoteístas: a de que o universo é feito para o proveito do tipo humano. Há, conforme se procurará demonstrar a seguir, evidências *físicas* de que o cosmo é biofílico e até capaz de favorecer a emergência da vida[191].

2.4. Constantes físicas cósmicas.

O objetivo número 7 do Instituto de Astrobiologia da National Aeronautics and Space Administration (NASA)[192] se refere à importância de encontrar métodos de reconhecimento de bioassinaturas no universo. No que tange a este objetivo, astrofísicos e astrobiólogos se valem das ferramentas técnicas disponíveis de modo a tentar identificar ao menos bons indícios de que outro mundo seja capaz de abrigar a vida conforme a conhecemos, ou que a tenha abrigado um dia. Tais investigações envolvem abordagens empíricas, como quando a sonda Galileu identificou *in situ* que Europa, lua de Júpiter, possui um oceano muito mais volumoso que o terrestre. Mesmo no que tange a mundos extremamente distantes, como é o caso dos exoplanetas, o uso da espectroscopia nos permite identificar quais mundos são similares à Terra[193].

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[191] Considerando, aqui, que *anthropos* diz respeito à forma humana, primata. Para o transumanismo, a forma humana é etapa, não causa final. Esta seria a consciência.

[192] *NASA Astrobiology Roadmap*, disponível em: https://nai.nasa.gov/media/medialibrary/2013/09/AB_roadmap_2008.pdf. Acessado em 16 de dezembro de 2018.

[193] Exoplanetas que tenham composição rochosa são similares à Terra, e capazes de manter uma superfície líquida. Atualmente, há dez bons candidatos entre todos os exoplanetas conhecidos, de acordo com o Planetary Habitability Laboratory of Arecibo, em Porto Rico: http://phl.upr.edu/projects/habitable-exoplanets-catalog. Acessado em 16 de dezembro de 2018.

Nesta tese, definimos os biosinais como um conjunto de fatores mensuráveis classificados em dois tipos: (1) o biosinal como uma *potência*, capaz de identificar condições físicas que tornam possível a existência ou futura emergência da vida, o que define o ambiente como biofílico; (2) o biosinal como um *ato*, entendido como bioassinatura, capaz de identificar ambientes onde a vida efetivamente emergiu e existe (mundos bióticos). Ou que já existiu, mas se extinguiu (mundos pós-bióticos). Enquanto a identificação de clorofila constituiria um biosinal de tipo-2, algo como a presença de água em estado líquido é um biosinal de tipo-1, o que torna Europa, Enceladus e Io, luas de Júpiter, bons candidatos à investigação astrobiológica. Do mesmo modo, o fato de um exoplaneta[194] orbitar uma determinada estrela na específica distância que permite a existência de água líquida constitui, também, um biosinal de tipo-1, mesmo que vida não tenha sido de fato identificada. O que caracteriza o tipo-1, em suma, é a *potência*: uma ou mais marcas identificáveis e mensuráveis cuja presença muda o estatuto da existência de vida de meramente *possível* para *provável*. O tipo-2 é um *ato*: probabilidade convertida em fato.

Gardner, por sua vez, argumenta que:

> **Goal 7 of the NASA Astrobiology Roadmap states: "Determine how to recognize signatures of life on other worlds and on early Earth. Identify biosignatures that can reveal and characterize past or present life in ancient samples from Earth, extraterrestrial samples measured *in situ*, samples returned to Earth, remotely measured planetary atmospheres and surfaces, and other cosmic phenomena." The cryptic reference to "other cosmic phenomena" would appear to be broad enough to include the possible identification of biosignatures embedded in the dimensionless constants of physics. (…) According to the SB[195] hypothesis, the laws and constants of physics function as the cosmic equivalent of DNA, guiding a cosmologically extended evolutionary process and providing a blueprint for the replication of new life-friendly progeny universes[196].**

No excerto acima, Gardner se refere às considerações de Rees[197] de que a estrutura da realidade, a partir de seis valores, é "finamente ajustada"[198] para

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[194] Por exemplo: TRAPPIST-1e, planeta localizado a 39 anos-luz de nosso sistema solar.
[195] Biocosmo egoísta.
[196] GARDNER, J. *The Physical Constants as Biosignature: An Anthropic Retrodiction of the Selfish Biocosm Hypothesis.* Originalmente publicado em maio de 2005 no *The International Journal of Astrobiology*. Republicado em 28 de fevereiro de 2006 em http://www.kurzweilai.net/the-physical-constants-as-biosignature-an-anthropic-retrodiction-of-the-selfish-biocosm-hypothesis). Acessado em 16 de dezembro de 2018.
[197] Martin John Rees (nascido em 1942), astrofísico e cosmólogo britânico.
[198] A expressão "finamente ajustada" tem uma série de problemas, sendo o maior deles o fato de que dá a entender que alguém ou algo realizou um ajuste. Conforme se verá, é perfeitamente possível falar em ajuste acidental.

permitir a existência da vida, e que qualquer alteração em um dos valores, por irrisória que fosse, a invalidaria. Estes seis números são (REES: 1999): (1) **N**, as forças elétricas que mantêm os átomos unidos dividida pela força da gravidade entre eles, valor que resulta em 10^{36}. Se o valor de **N** fosse mais fraco, o universo teria uma vida curta e seria tão pequeno que nenhum ser vivo maior que insetos poderiam se desenvolver; (2) o número **ε**, cujo valor é 0.007, define a firmeza dos núcleos atômicos. A quimiossíntese estelar transmuta hidrogênio em todos os outros elementos existentes, logo cada átomo em nosso universo foi forjado dentro de estrelas. Alguns elementos são bastante comuns, como o carbono e o hidrogênio, enquanto outros são raros, como o urânio. Se o valor de **ε** fosse diferente, as moléculas não poderiam se formar, e a vida não poderia existir; (3) O número **Ω** diz respeito à quantidade de material em nosso universo, o que inclui material escura também. Se este valor chegasse a um ponto crítico, o cosmo já teria colapsado. Por outro lado, se este número fosse menor do que um determinado ponto, a consequência seria um cosmo sem estrelas; (4) **λ** é uma nova força descoberta apenas em 1998, e se refere à antigravidade que controla a expansão cósmica. Ela é tão sutil que seus efeitos não são discerníveis em escalas menores do que um bilhão de anos-luz. Se **λ** fosse mais forte, estrelas e galáxias teriam sido impedidas de se formar; (5) **Q** é um valor (em torno de 0.000001) que representa a razão de duas energias fundamentais. Um **Q** menor resultaria em um cosmo inerte. Se fosse mais largo, **Q** produziria um universo repleto de buracos negros gigantes, um cosmo hostil à vida; (6) por último, mas não menor importante, temos o número **D**, o mais conhecido dentre todos: o número de dimensões espaciais. A vida como nós a conhecemos não poderia existir em uma realidade bidimensional ou tetradimensional[199].

Ou seja, astrofísicos em geral tendem a concordar que o nosso universo é estranhamente biofílico. Por conseguinte, adeptos da existência de um *telos* cósmico tendem a tomar esses dados como argumento para defender a ideia de que tais valores revelam um ajuste que, por seu alto grau de refinamento, justamente por constituir coincidência demais, indicaria a existência de uma inteligência ordenadora. A vida, para estes, não seria um atributo contingencial do universo, mas sim um

[199] O tempo é considerado uma quarta dimensão, mas, ao contrário das outras três, o tempo é aparentemente irreversível.

atributo necessário. Contingencial seria, isso sim, a *forma* que a vida assume. Em um salto de fé ainda maior, conforme expressado por Chardin em seu *Phenomenon*, tais princípios são considerados *antrópicos*, ou seja, o tipo humano seria a causa final do universo, resultante de um logos cosmológico. Já Gardner se refere à mente (e não ao tipo humano) como uma causa final. Uma vez que tal mente pode emergir em entidades alienígenas cuja fisiologia seja totalmente distinta da nossa, não é sem razão que Gardner, apesar se referir a um princípio antrópico em seus artigos, corriqueiramente o faz entre aspas.

Todavia, o rigor filosófico exige apontar que um problema concernente ao artigo de Gardner diz respeito ao fato de ele considerar estas constantes físicas como *bioassinaturas*. Conforme explicado precedentemente, tais constantes físicas são mais adequadamente definidas como *biosinais tipo-1*. "Bioassinatura" é uma categoria pertencente ao conjunto de biosinais (tipo-2), dado que *assinatura* significa *o ato de assinar*. Deste modo, a distinção entre um "sinal" e uma "assinatura" é baseada na diferença entre potência e ato. A definição da NASA informa que *all biosignatures are characteristic of the modification of a local or planetary environment by life*[200], ou seja, a agência americana define como "bioassinaturas" apenas as que a presente tese classifica como tipo-2. Neste caso, diz-se que *A biosignature is an object, substance and/or pattern whose origin specifically requires a biological agent*[201] (ou seja, um ato). Ainda assim, tanto a agência espacial americana (NASA) quanto a europeia (ESA) dedicam esforços no sentido de investigar os mundos cujos biosinais são de tipo-1, por se tratarem de lugares onde há melhores chances de se encontrar biosinais de tipo-2.

Constatar que nosso universo é biofílico implica necessariamente considerar que isso se dá por conta de valores que, se fossem sutilmente diferentes, produziriam um universo estéril. A biofilia seria, portanto, uma característica necessária do universo, e não meramente contingencial. Positivistas possivelmente criticarão a expressão "ajuste fino", argumentando que o termo em si é controverso por dar a entender que *algo* ou *alguém* realizou um ajuste. E, de fato, se tomarmos como referência a obra de Chardin, veremos de modo bastante claro que ele se refere a um logos cosmológico, e a marcha evolutiva da vida é vista como uma

[200] *NASA Astrobiology Roadmap*, publicado em: https://nai.nasa.gov/media/medialibrary/2013/09/AB_roadmap_2008.pdf. Acessado em 16 de dezembro de 2018.
[201] Idem.

inexorável história de sucesso rumo ao Cristo cósmico. A despeito de a tese de Chardin ser tentadora para as pessoas de fé, é altamente contestável. E é o próprio Jonas quem a contesta, ao dizer que:

> **"Information" requires for itself, as its physical substrate, a differentiated and stable system. For living things, this would be the genome with its molecularly full articulation and constancy (for the computer it would be the magnetically spelled-out programming or "software"). Information, therefore, is not only a cause, but already a result of organization. It is a deposit and expression of something previously attained, which is perpetuated through this information, but not surmounted by it. Now *neither* articulation *nor* stability have a place in the totally undifferentiated and dynamic "substance" (hypothetically speaking) of the "Big Bang" or in any "chaos" at all. For this reason the hypothesis of a cosmological "logos" – in general, every pre-established programming and systematic arrangement – dwelling already in developing matter right from the start, is eliminated as an explanatory model of development. Briefly put, information is something stored, and the "Big Bang" had no time for storing anything (JONAS: 1996: pg. 167).**

Entretanto, a despeito de não estar disponível desde o princípio dos tempos por uma impossibilidade não apenas genética como lógica, a informação ou *logos* surge no coração da matéria, graças ao fator transcendente que, conforme nos explica Jonas, é o fator darwinista do *erro da cópia*. Sem erro, sem caos e desordem, a informação estaria fadada a se reproduzir *ipsis literis* até o fim da eternidade. Na prática, ocorreram mutações significativas ao longo da história cósmica: o hidrogênio primordial se converteu em hélio, estrelas surgiram, assim como galáxias, e a vida emergiu, com toda a sua interioridade. E só aí o *logos* emergiu. Esta subjetividade é um dado ontológico fundamental do ser, pois é a partir dela que o universo contempla a si mesmo, e atribui valor às coisas. Mas se não havia informação presente no momento do Big Bang, de que forma poderíamos entender o universo emergente *antes* que a ordem cíclica capaz de abrigar a vida se estabelecesse? É Jonas, mais uma vez, quem oferece uma resposta, ao dizer que não havia garantia de nada, mas, no máximo, uma eventual possibilidade de interioridade. Uma mera possibilidade não deve ser confundida com um positivo ser-disposto (*Angelegstein*), pois não havia propósito, e sim um anseio, uma tendência. Para Jonas, o que há, no máximo, é um *desejo*, mas não um plano, e por isso ele cunha a expressão *eros cosmogônico*, em contraposição a *logos cosmológico* (JONAS: 1996: pg. 172). A finalidade surge *após* a emergência da vida, não antes dela. Conforme Jonas:

> **Life is its own purpose (*Selbstzweck*), i.e., an end actively willing itself and pursuing itself. Purposiveness as such, by means of its eager "yes" to itself, is infinitely superior to that which is indifferent, and can easily be seen for its part as the purpose – the secretly longed-for goal – of the entire undertaking of the universe which otherwise seems so empty. This means that right from the beginning matter is subjectivity in its latent form, even if aeons, plus exceptional luck, are required for the actualizing of this potential. Only this much about "teleology" can be gleaned from the evidence of life alone (JONAS: 1996: pg. 173).**

Há, entretanto, outros problemas a considerar quando nos referimos a uma suposta biofilia cósmica:

O primeiro problema é da ordem da contingência e da necessidade. Não sabemos o quanto esses números estão relacionados, de modo que alterar um poderia alterar outro e, se assim for, não há nada de "especial" na estrutura de nossa realidade. Os valores descritos por Rees não seriam necessários, mas contingentes, e a vida surgiria de uma forma ou de outra. Mas, note-se, ainda que os valores sejam contingenciais e se ajustem em função uns dos outros, se afirmarmos que a vida surgiria inevitavelmente, atribuiremos à sua existência um significado de necessidade.

O segundo problema concerne ao fato de que nosso universo pode ser apenas um dentre tantos outros e, portanto, pode constituir um acidente em que a vida surgiu, sendo que em muitos outros universos teríamos cosmos isentos de estrelas. Universos compostos apenas por moléculas de hidrogênio, por exemplo. Citamos Rees:

> **These six numbers constitute a "recipe" for a universe. Moreover, the outcome is sensitive to their values: if any one of them where to be "untuned", there would be no stars and no life. Is this tuning just a brute fact, a coincidence? Or is it the providence of a benign Creator? I take the view that it is neither. An infinity of other universes may well exist where the numbers are different. Most would be stillborn or sterile. We could only have emerged (and therefore we naturally now find ourselves) in a universe with the "right" combination (REES: 1999).**

Essas considerações de Rees nos conduzem às próximas apostas metafísicas desta tese: existem outros universos (incontáveis ou infinitos), isso pode ser demonstrado, e a existência deles aumenta as chances da teleologia da vida. Uma teleologia que, conforme propõem tanto Gardner, quanto Chardin e Jonas

(ainda que com diferenças[202] entre eles), é a emergência de uma super-mente cósmica.

2.5. Da existência de múltiplos universos.

Discorrer a respeito da existência de múltiplos universos tem, nesta tese, dupla função: (1) demonstrar que, se eles existem, os elementos de *garantia e otimismo* presentes na tese de Chardin em seu *Phenomenon* perde força, dado que em universos estéreis nem mesmo microrganismos poderiam surgir, tampouco a mente cósmica emergente poderia se estabelecer. O universo no qual estamos inseridos deixa de ser *necessidade*, e passa à categoria de mera *contingência*. É bem verdade que na tese de Gardner, exposta em *The Intelligent Universe*, a possibilidade de um multiverso não causa nenhuma grande perturbação, pois o fato de uma inteligência cósmica emergente ser viável neste, mas não necessariamente em outro universo, não faz diferença. Gardner não está comprometido com a possibilidade de uma divindade pré-existente, mas com uma super-entidade emergente e futura. A tese otimista de Chardin, lastreada em certeza e necessidade, se vê desafiada por um multiverso composto por universos onde nada se realiza; (2) demonstrar que, por outro lado, a concepção de multiverso aumenta consideravelmente a *chance*, elemento fundamental na *alternative speculation of cosmogony* de Jonas (JONAS: 1996: pg. 189-191), que narra a história de um Deus que renuncia ao seu próprio poder para que o universo possa existir, cabendo ao tipo humano talvez – e apenas talvez – reconstituí-lo.

Retornaremos às especulações de Jonas mais adiante. Por enquanto, basta ter em mente que sua heurística do medo se pauta exatamente no risco de destruirmos esta *chance*. Ocorre que *se* Jonas tem razão em sua especulação cosmogônica, então temos um Deus que joga um jogo. O porquê de fazê-lo é algo que nem mesmo Jonas responde, e não se pretende, aqui, oferecer tal resposta. Pretende-se, contudo, demonstrar que este "Deus que joga um jogo" e que voluntariamente se torna *oni(m)potente* (um significativo neologismo) não aposta tudo em um único universo. Ele o faz em muitos outros, talvez infinitos, e, ainda que

[202] Para Gardner, o espalhamento da inteligência e consequente contaminação de todo o universo, que conduziria à emergência da mente cósmica; para Chardin, o garantido e inevitável retorno ao Cristo; para Jonas, a possível, mas não garantida, ressurreição do Deus que se sacrificou para que o universo pudesse existir.

a multiplicidade nada garanta, amplia consideravelmente as probabilidades. Ou seja: se Chardin não está certo em seu otimismo, por sua vez Jonas poderia se tranquilizar um pouco em sua heurística, dado que as chances são melhores do que as por ele imaginadas.

Há pelo menos duas formas de defender a existência de universos múltiplos. Uma delas é pelo puro exercício de filosofia da mente, a qual aborda os infinitos cenários possíveis como ontologicamente tão reais quanto o cenário no qual se insere o autor da presente tese e seus leitores. Conforme Lewis[203]:

> **There are so many other worlds[204], in fact, that absolutely *every* way that a world could possibly be is a way that some world *is*. And as with worlds, so it is with parts of the worlds. There are ever so many ways that a part of a world could be; and so many and so varied are the other worlds that absolutely every way that a part of world could possibly be is a way that some part of world is (LEWIS: 1986: pg. 6).**

Ou seja, quando dizemos que algo é "real", estamos nos referindo ao universo no qual estamos inseridos. A tese[205] de Lewis é a de que todos os universos possíveis são reais, mesmo os mais bizarros imaginados, e o nosso próprio universo não é mais real do que qualquer outro. Qualquer coisa imaginada como possível é efetivamente possível, e em algum universo Harry Potter estará se matriculando no curso de magia em Hogwarts, ou Drácula, o vampiro, estará sendo caçado por Van Helsing. Há, contudo, diferenças substanciais entre a tese do realismo modal de Lewis e a tese aqui defendida. Ainda que a presente tese advogue em favor da existência de outros universos, na concepção de Lewis eles são *disjuntos*:

> **There are countless other worlds (…) and they are not remote. Neither are they nearby. They are not at any spatial distance whatever from here. They are not far in the past or future, nor for that matter near; they are not at any temporal distance whatever from now. They are isolated: there are no spatiotemporal relations at all between things that belong to different worlds. Nor does anything that happens at one world cause anything to happen at another. Nor do they overlap; they have no parts in common with the exception, perhaps, of**

[203] David Kellogg Lewis (1941-2001), American philosopher.
[204] Neste específico subcapítulo, a expressão "mundos" será sempre sinônimo de "universo", e não de "planeta". Esta escolha tem por objetivo respeitar as terminologias aplicadas por Lewis e outros autores, como o físico Hugh Everett III.
[205] Lewis's ideas on multiple universes seem to be based on Anselm's traditional ontological argument, which attributes actuality to God because of the idea of God. This is very evident in one of his early papers, *Anselm and Actuality* (1970).

> **immanent universals exercising their characteristic privilege of repeated occurrence (LEWIS: 1986: pg. 6).**

Ao contrário de Lewis, a presente tese defende que alguns universos são *intersecionais*, ou seja, não apenas existem como interferem fisicamente entre si. A interferência é fraca, mas suficientemente clara para ser identificada. Além disso, Lewis defende que todas as possibilidades necessariamente existem, o que introduz um elemento de garantia cujas implicações beiram o niilismo: se tudo o que pode existir, existe, não há porque lutar por nada, pois em algum universo as coisas terão se realizado. Esta *garantia*, conforme veremos no último capítulo, constitui o oposto da força da vida, que se realiza através de tensão, dúvida, incerteza, desejo.

A diferença entre a presente tese e a de Lewis não se limita à ontologia dos universos múltiplos, mas à razão de considerar seriamente sua existência. Para Lewis, a tese do realismo modal é um *exercício útil*. Diz ele:

> **Why believe in a plurality of worlds? – Because the hypothesis is serviceable, and that is a reason to think that is true. The familiar analysis of necessity as truth at all possible worlds was only the beginning. In the last two decades, philosophers have offered a great many more analyses that make reference to possible worlds, or to possible individuals that inhabit possible worlds. I find that record most impressive. I think it is clear that talk about *possibilia* has clarified questions in many parts of philosophy of logic, of mind, of language, and of science – not to mention metaphysics itself. (…) As the realm of sets is for mathematicians, so logical space is a paradise for philosophers. We have only to believe in the vast realm of *possibilia*, and there we find what we need to advance our endeavours (LEWIS: 1986: pg. 8).**

A presente tese, por sua vez, sustenta que a multiplicidade de universos não é tão somente um exercício mental/filosófico útil, mas um fato cuja demonstração demanda (1) algumas considerações a respeito da filosofia da ciência; (2) um experimento físico – especificamente, do comportamento da luz. Ambos os pontos, conforme descritos a seguir, são abordados por Deutsch[206] em sua obra *The Fabric of Reality*[207].

Partamos, pois, do primeiro ponto. Conforme Deutsch, um erro cientificista comum é considerar que a ciência se faz a partir de experimentações empíricas, e é validada por reproduções laboratoriais. Tais experimentações são necessárias, mas o fundamental é a *explicação*, pois sem ela não há ciência. Por diversas vezes ao longo da história da ciência, a simples observação do comportamento da luz

[206] David Elieser Deutsch (nascido em 1953), físico israelense.
[207] Publicada no Brasil no ano 2000, pela editora Makron, com o nome *A Essência da Realidade*.

modificou inteiramente o nosso entendimento do universo. O fenômeno observado era o mesmo, mas o entendimento do fenômeno foi modificado. Vejamos alguns exemplos:

A hipótese heliocêntrica de Copérnico se fundamenta em grande parte no fato de que, ao inserirmos o Sol como centro do sistema ao invés do planeta Terra, a explicação do funcionamento das órbitas planetárias se torna muito mais simples. A posição dos astros, representados por pontos de luz no céu noturno, se tornava menos aberrante. A despeito de não possuir tecnologia que lhe permitisse enviar uma sonda ao espaço a fim de comprovar o heliocentrismo, Copérnico apresentou para o fenômeno das revoluções celestes uma *explicação* mais razoável do que a que então existia[208].

Por sua vez, a teoria heliocêntrica copernicana, apesar de correta ao inserir o Sol como centro do sistema, propunha órbitas circulares para os planetas. Entre a posição calculada e disponível nas efemérides da época e a posição real da luz solar refletida pelos planetas no céu, havia um pequeno, quase imperceptível desvio. Corrigindo os cálculos, Kepler concluiu que as órbitas deveriam ser não circulares, mas elípticas. A luz não estava onde deveria estar e, mesmo sem dispor de nossa tecnologia avançada, Kepler apresentou *outra explicação* para o fenômeno.

Newton[209], por sua vez, *explicou* as elipses propostas por Kepler através da lei do inverso do quadrado das forças gravitacionais. Com o tempo, entendeu-se que, considerando a lei de Newton, a atração entre planetas causaria minúsculos desvios nas órbitas elípticas. Graças à percepção desses desvios, ou seja, mais uma vez graças ao fato de a luz observada não estar onde deveria estar, astrônomos consideraram que deveria haver outro planeta além de Urano e, de fato, em 1846 Netuno foi descoberto, referendando a teoria de Newton.

Séculos depois, o entendimento da natureza do espaço e da gravidade foi ampliado mais uma vez graças aos comportamentos aberrantes da luz. O eclipse solar de 1919 na cidade brasileira de Sobral[210], por exemplo, permitiu a

[208] A explicação anterior, pautada na cosmologia ptolomaica, ainda que fosse razoável, demandava maior complexidade. A sofisticação do modelo ptolomaico "salvava", por assim dizer, a posição da Terra como centro do sistema, conforme proposto por Aristóteles.
[209] Isaac Newton (1643-1727), matemático, físico e filósofo inglês.
[210] Apesar de outra equipe ter se dirigido para São Tomé e Príncipe a fim de observar o eclipse, as condições meteorológicas locais não permitiram uma observação adequada. Coube à outra equipe, liderada por Crommelin, obter imagens mais precisas do mesmo eclipse em Sobral. As placas fotográficas de Crommelin mostravam claramente uma deflexão luminosa de 1.98, confirmando as previsões dos cálculos de Einstein.

Crommelin[211] confirmar a *explicação* einsteiniana de que o espaço é curvo e que, por isso, a luz das estrelas, ao passar pelo sol, sofria o dobro da deflexão que se imaginava ocorrer. A observação do eclipse mais uma vez levou em conta que a luz não se comportou conforme se esperava.

A finitude de nosso universo é relativamente simples de demonstrar e sua explicação é, até o momento, ponto pacífico para a astrofísica. Ainda que não seja possível provar isso empiricamente, é o comportamento da luz que nos permite uma *explicação*. Consideremos a luz do dia, em primeiro lugar. O que chamamos de "céu diurno" se deve não ao que nos diz o senso comum. O senso comum responde que a luz diurna se deve ao fato de o Sol estar acima do horizonte em um determinado lugar, mas isso é apenas uma verdade parcial. Mesmo com o Sol acima do horizonte na lua, o céu permanece escuro. A diferença, em nosso planeta, decorre do fato de nosso mundo ter uma atmosfera e a pequena fração de luz que nos chega se espalhar pelas moléculas gasosas que compõem essa atmosfera. Ocorre que, levando em conta as centenas de bilhões de estrelas existentes em nossa galáxia, caso nosso universo fosse eterno ou espacialmente infinito, não existiria "céu noturno". Cada canto do céu observável teria a luz visível de uma estrela ou galáxia, mesmo quando o Sol estivesse do outro lado do horizonte. Tal não ocorre porque a luz não teve tempo de nos alcançar. Ou seja, o universo é imenso, porém finito.

Todos os exemplos anteriores servem para ilustrar o quanto as considerações acerca dos desvios da luz, sejam estas considerações sofisticadas ou banais, desencadearam modificações significativas a respeito do entendimento da realidade. A progressiva sofisticação de nossos instrumentos de medição, tais quais os telescópios, tem nos permitido identificar detalhamentos minuciosos. Quanto maior a minúcia, maior a sofisticação do nosso entendimento da realidade, como no caso das medições da luz no eclipse em Sobral: uma diferença de deflexão mínima, mas suficiente para nos fazer entender que o espaço é curvo.

Entretanto, à parte o fato de hoje podermos verificar diretamente algumas coisas, como o fato de que o Sol é o centro do sistema e não a Terra, outras não são garantidas, ainda que sejam explicações quase consensuais para a ciência contemporânea. A curvatura do espaço, ou mesmo a existência de matéria escura, são fatos inferidos indiretamente e nada impede que, no futuro, surjam explicações

[211] Andrew Claude de la Cherois Crommelin (1865-1939), astrofísico britânico.

diferentes para os fenômenos observados. A razoabilidade das teorias científicas não deriva – conforme tendem a argumentar alguns instrumentalistas ingênuos – do poder de previsão de um experimento. A física prática, laboratorial, costuma se valer de experimentos reproduzíveis, a partir dos quais obteremos resultados que nos permitirão elaborar generalizações que justificarão uma dada teoria. O procedimento está correto. Imaginar que o valor de uma teoria se fundamente exclusivamente na repetibilidade, contudo, é um equívoco claramente indutivista e falso sob diversos aspectos, ainda que a indução nos forneça informações que nos permitam apostar – mas jamais garantir – que determinada teoria é verdadeira. O que nos faz validar uma teoria científica, conforme elucida Popper[212], não é, como se costuma dizer sobre o autor, a mera falseabilidade do experimento, mas antes a *explicação* dessa dada teoria.

A repetibilidade e a frequência estatística são condições necessárias, mas não suficientes, para validar uma teoria. Previsões inconsistentes e incorretas tornam a explicação insatisfatória, mas previsões acertadas não implicam necessariamente explicações acertadas e uma teoria consistente[213]. Conforme destaca Deutsch:

> **What we need is an explanation-centred theory of knowledge: a theory of how explanations come into being and how they are justified; a theory of how, why and when we should allow our perceptions to change our world-view. Once we have such a theory, we need to separate theory of predictions. For, given an explanation of some observable phenomenon, it is no mistery how one obtain predictions. And if one has justified an explanation, then any predictions derived from that explanation are automatically justified too (DEUTSCH: 1997: pg. 61)**

Outro equívoco comum ocorre quanto vinculamos teorias à repetibilidade. Nesses casos, tem-se a ilusão de que teorias traduzem entendimentos definitivos. Elas traduzem, isso sim, *o melhor entendimento possível num dado momento*. Conforme Deutsch:

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[212] Karl Raimund Popper (1902-1994), filósofo da ciência austríaco/britânico.

[213] Tomemos o exemplo da astrologia: não importa que um astrólogo acerte em noventa por cento de suas previsões, por mais objetivas que elas sejam. Ainda que ocorra esse alto grau de acerto, a explicação do fenômeno astrológico continua a ser inconsistente: se é "influência planetária", no que ela se baseia? Por que não é mensurável? Se não há "influência", o que justifica o acerto? A astrologia poderia apresentar – e permitir reproduzir – previsões objetivas e acertadas, mas, na ausência de uma explicação para o fenômeno, não é possível falar em "ciência astrológica", mas em "conhecimento astrológico". Aqui, a distinção entre os termos "ciência" e "conhecimento" se dá pela explicação: presente no primeiro caso, ausente e/ou vaga no segundo.

> **In science the object of the exercise is not to find a theory that will, or is likely to, be deemed true forever; it is to find the best theory available now, and if possible to improve on all available theories. A scientific argument is intended to persuade us that a given explanation is the best one available. It does not and could not say anything about how that explanation will fare when in the future it is subjected to new types of criticism and compared with explanations that have yet to be invented. A good explanation may make good predictions about the future, but the one thing that no explanation can even begin to predict is the content or quality of its future rivals (DEUTSCH: 1997: pg. 62).**

Um critério importante para uma boa explicação é *evitar metáforas e analogias*. A analogia, ainda que funcione para facilitar explicações, é um recurso cognitivo bastante delicado, pois transfere qualidades de um ente para outro. Por mais semelhantes que tais entes sejam, analogia não é identidade e deveria sempre levar em alta conta também as diferenças entre os entes. Se dizemos que "A" está para "B" assim como "C" está para "D", isso pode ser eficiente em termos de comunicação, de estímulo mnemônico, de percepção e de emoção, entretanto uma análise minimamente detalhada evidenciará falhas sérias na analogia. Alguém pode explicar que "gatos" estão para "leões" assim como "cães" estão para "lobos", mas a analogia apresentará problemas sérios a partir do momento em que apurarmos as diferenças na relação entre os entes gato/leão e cão/lobo.

A metáfora na explicação científica é um recurso ainda mais delicado, pois evoca significados simbólicos altamente imprecisos que tendem a expor apenas a dificuldade no sentido de elaborar uma explicação eficiente. Se dizemos que "A" se comporta *como se* fosse "B", na verdade não sabemos como "A" se comporta, apenas admitimos que seu comportamento *nos faz lembrar* "B".

Tudo considerado, veremos a seguir que a existência de metáforas e suas construções linguísticas repletas de "como se" estão presentes em uma das mais importantes teorias científicas contemporâneas: a do fenômeno da interferência quântica. Para que uma melhor explicação seja dada para este fenômeno, é preciso eliminar as metáforas e analogias que a contaminam.

Como a presente tese é de natureza filosófica e este capítulo se refere a um experimento físico, faz-se necessário descrever o experimento para aqueles que são leigos. Tomemos, pois, o descritivo fornecido por Deutsch:

Se considerarmos um emissor luminoso artificial qualquer e nos afastarmos gradualmente dele, mas sempre mirando-o, veremos o refletor cada vez menor, até que se torne um ponto diminuto. A uma distância muito grande, a luz simplesmente desaparecerá, ou, melhor dizendo, não a veremos mais, ainda que continue no

mesmo lugar. O experimento da lanterna é banal e as conclusões seriam frívolas se nos baseássemos tão somente em nossos limitados sentidos humanos. Se assim procedêssemos, incorreríamos em empirismo ingênuo. Confiar em conclusões sobre a realidade tomadas a partir de sentidos cuja natureza nós mesmos sabemos ser extremamente limitada é tudo o que não precisamos quando falamos em fazer ciência.

A descrição do experimento da lanterna seria bastante distinta se, por exemplo, uma rã pudesse descrevê-lo. Deutsch toma uma rã como exemplo, dado que esse animal possui olhos muitas vezes mais sensíveis do que o mais bem capacitado olho humano, de modo que, ao se afastar da luz, uma rã jamais deixará de vê-la[214]. A luz não desaparecerá e tampouco seu brilho diminuirá, mas *tremeluzirá*. Quanto maior for a distância entre a rã e a lanterna, maiores serão os intervalos de cintilação, de modo que, a uma distância de centenas de milhões de quilômetros, o intervalo entre um cintilar e outro será o de um dia inteiro. Entretanto, a intensidade do brilho será *exatamente a mesma* a qualquer distância. Percebe-se que não ocorre um enfraquecimento uniforme da luz, como quando nossos olhos humanos estão envolvidos. A tremulação, cujo brilho será sempre idêntico, terá em seus intervalos o indicativo da distância. Tais tremulações demonstram que, se a luz for espalhada, há um limite físico para isso. As cintilações detectadas pela retina do olho da rã ou pelos fotomultiplicadores não decorrem do "enfraquecimento da luz" causado pela distância de um dado luminar. Ocorre que o que chamamos de "luz" é a percepção que temos dos trilhões de fótons que compõem um feixe. Quanto mais distante a rã está da lanterna, mais separados estão os fótons individuais entre si. Assim, graças à sua notável capacidade visual, a rã detecta fóton a fóton. A luz não "enfraqueceu", foi a distância entre os fótons que aumentou.

Diz-se, por tudo o que acabamos de descrever, que os fótons são *partículas*. A expressão *quantum* se aplica a qualquer coisa existente que possa ser mensurada, como, no presente caso, a luz. Se nos fiássemos das conclusões de nossos sentidos, concluiríamos que a luz viaja sempre em linha reta. Experimentos relativamente simples demonstram, contudo, que a luz se curva. Ou, ainda de forma mais curiosa, demonstram que a luz não é mais dúctil do que, por exemplo, um fio

[214] Sabemos disso por nosso conhecimento da competência ótica dos olhos das rãs. Somos capazes de reproduzir essa competência em fotomultiplicadores de alta sensibilidade, após passarmos a luz por filtros escuros.

de ouro. Se tomarmos um feixe de luz que passa pelo buraco de um aparato perfeitamente opaco; e em seguida a passarmos por outro buraco de diâmetro menor do que o primeiro em um segundo aparato idêntico disposto de forma perfeitamente paralela; e assim sucessivamente, aparato após aparato com furos cada vez menores, a luz passa a ter um comportamento estranho. Ao atravessar furos não tão pequenos, de apenas um milímetro de diâmetro, a luz se espalha, se desfia. Quanto menor o orifício, mais a luz se desfia, criando padrões bastante curiosos de intercalação luz-sombra.

Aqui é importante destacar que é possível moldar o ouro em fios de um décimo milésimo de milímetro de espessura. Ou seja: por um buraco desse tamanho seria possível passar um fio de ouro, mas não um feixe de luz. Isso teria a ver com o "tamanho" do fóton? Seria possível definir um "tamanho" para as partículas luminais? Se sim, um fóton seria maior que um átomo de ouro? Eis o problema: em física, diz-se que fótons possuem "tamanho zero", dado que se tratam de partículas elementares, sem dimensão. O curioso é que um átomo, por menor que seja, possui tamanho. O menor de todos, do hidrogênio, mede 53 picometros de raio, ou $53*10^{-12}$ metros. O átomo do ouro mede 174 picometros de raio, ou $174*10^{-12}$ metros. A curiosidade é que algo com tamanho mensurável (um fio de ouro) é capaz de passar por um furo cuja espessura é igual a um décimo de milímetro, enquanto a luz, teoricamente de "tamanho zero", se desvia ao passar pelo mesmo furo.

Se passarmos um laser vermelho[215] por duas fendas paralelas separadas por um quinto de milímetro em uma barreira opaca, obteremos o seguinte padrão de sombras projetado em uma parede a três metros do aparato:

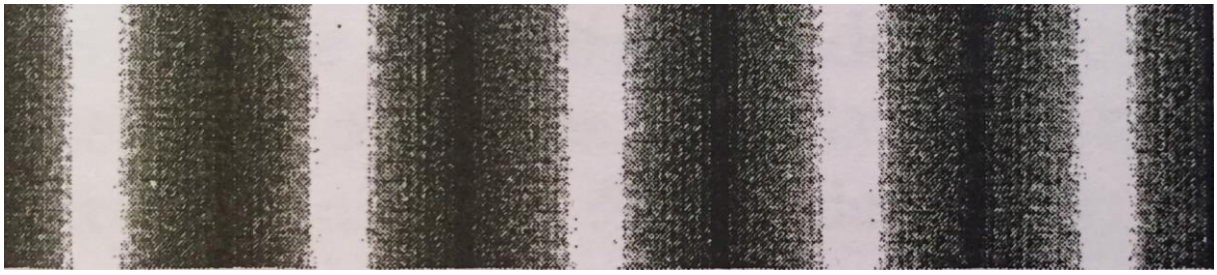

Figura 1: padrão de sombras. Imagem ampliada em relação à imagem real obtida de acordo com o descritivo do experimento[216].

[215] Opta-se por um laser vermelho e não uma lanterna, porque a forma da sombra depende muito da cor da luz que a projeta. A luz branca é uma reunião de todas as cores e, assim, projeta sombras cujas bordas são multicoloridas. Ainda que usássemos um filtro monocromático em uma lanterna, o filtro não seria tão perfeito quando um laser, que, por sua vez, pode ser ajustado para emitir determinada cor, quase que excluindo totalmente as outras cores do espectro.

O padrão de sombras resultante demonstra que a luz não viaja em linha reta e se desfia ao passar pelas fendas diminutas do aparato opaco. Caso viajasse em linha reta e não se desfiasse, teríamos como resultado um único par de faixas brilhantes cujas bordas seriam nítidas. O resto seria escuridão. Ao contrário, temos não apenas diversas faixas brilhantes, como também efeitos de sombra que vão do completo escuro até a penumbra.

O que aconteceria se, no mesmo aparato opaco, fizéssemos outro idêntico par de fendas separadas por um décimo de milímetro? O senso comum espera que os dois pares de fendas produzam o mesmo padrão, ainda que duas vezes mais brilhante e borrado. O que ocorre, na prática, não é nada disso. Vejamos o resultado do segundo experimento na segunda imagem. Para ressaltar o contraste, Deutsch dispõe o resultado do segundo experimento (a) em comparação com o resultado do primeiro experimento (b):

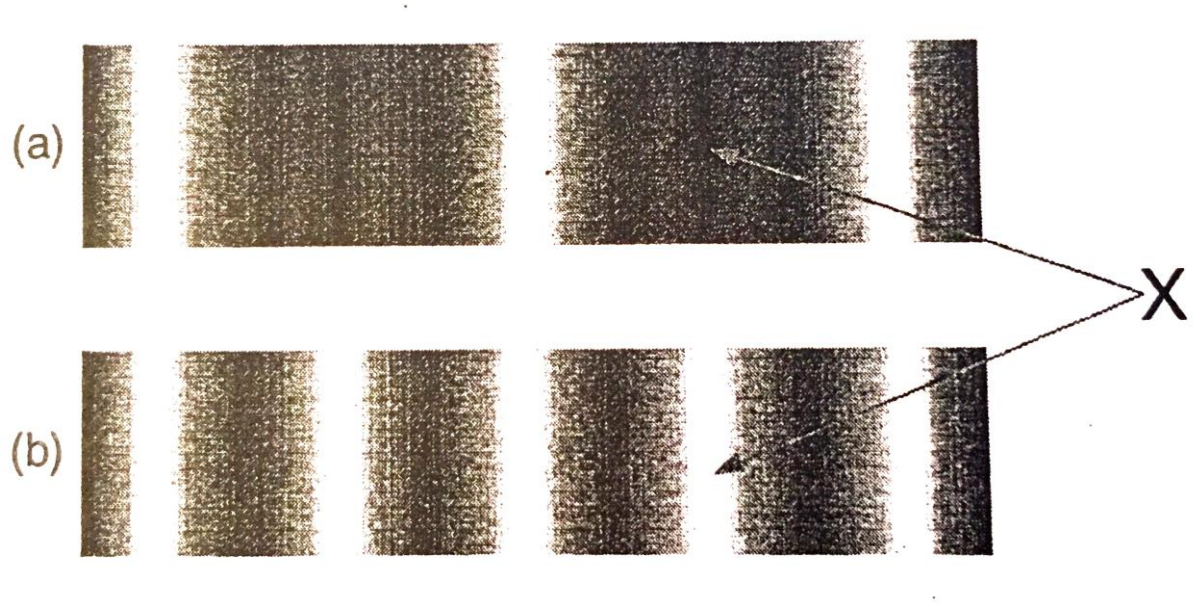

Figura 2: padrão de sombras, comparando o experimento 2 (“a”) com o experimento 1 (“b”). Imagem ampliada em relação à imagem real obtida de acordo com o descritivo do experimento[217].

O fenômeno contra-intuitivo ocorre na região definida pela figura 2 como “X”. A região era brilhante no experimento com duas fendas, mas escureceu quando dobramos o número de fendas.

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[216] Imagem extraída da obra de Deutsch, *The Fabric of Reality*.
[217] Imagem extraída da obra de Deutsch, *The Fabric of Reality*.

Uma explicação possível, porém falsa, é a de que dois fótons atravessaram as fendas, colidiram, a colisão os desviou e foram incidir em outro lugar da parede. A falsidade dessa explicação é demonstrável se, ao invés de emitirmos um contínuo feixe de laser, executarmos a experiência com um fóton por vez. Se fosse verdade que os fótons colidiram entre si no segundo experimento e geraram a região "X" escura, bastaria enviar um de cada vez para que a colisão não se desse. Todavia, realizando o experimento com um fóton por vez, o padrão de sombras resultante *é exatamente o mesmo*. À medida que enviamos um fóton de cada vez, um padrão vai surgindo pouco a pouco, inicialmente caótico e incoerente, até que a exata imagem "a" da figura 2 se revela. Repete-se, então, a pergunta: se um único fóton aleatório passa pelo aparato opaco de quatro fendas, *o que justifica o padrão ordenado no final, após o envio de diversos fótons?*

Vale aqui ressaltar, sobretudo para os não familiarizados com a física, que a natureza da luz foi alvo de muitas controvérsias ao longo da história da ciência. A civilização ocidental iniciou suas considerações definindo a luz como composta por partículas[218], em seguida passando a considerá-la como uma onda[219]. Na mudança do século XIX para o século XX, entretanto, a natureza ondulatória da luz passou a ser questionada em decorrência de contradições evidenciadas em experimentos de emissão fotoelétrica. Foi a partir das ideias de Planck[220] que Einstein demonstrou que um feixe de luz não é uma onda, mas composto por "pacotes de energia" definidos pelo nome de "fótons".

Desde então, a natureza da luz passou a ser considerada *dual*, e a teoria corrente é a da dualidade onda-partícula: ao se propagar pelo espaço, a luz se comporta como onda; ao incidir sobre uma superfície, comporta-se como partícula. A "dualidade onda-partícula" é correntemente a *explicação* majoritária, quase consensual.

Entretanto, para Deutsch, Everett III[221], DeWitt[222] e demais físicos adeptos da interpretação dos mundos múltiplos (*many-worlds interpretation*, doravante chamada MWI), há um sério problema explicativo nas considerações acerca da natureza da

[218] Com o atomismo, de Epicuro (341 a.C. – 271/270 a.C.) a Lucrécio (99 a.C. – 55 a.C.), passando pelas teorias de Newton (1643-1727) e seus seguidores nos séculos XVII e XVIII.
[219] Conforme definido por Huygens (1629-1695) e sustentado também por Grimaldi (1618-1663), assim como demonstrado por experimentos realizados por Young (1773-1829) e Fresnel (1788-1827) e, mais tardiamente, por Maxwell (1831-1879).
[220] Max Karl Ernest Ludwig Planck (1858-1947), físico teórico alemão.
[221] Hugh Everett III (1930-1982), físico norte-americano.
[222] Bryce DeWitt (1923-2004), físico norte-americano.

luz. Sintetizamos esse alegado erro a partir do que já foi explicado: *metáforas e analogias sendo utilizadas como recurso que apenas expõem que não se sabe o que está acontecendo*. Exatamente o que ocorre quando um cientista diz que a luz é *como se* fosse, ao mesmo tempo, onda e partícula.

Não é a previsão do fenômeno do experimento da dupla fenda que está sendo questionada. A previsão é a mesma, os métodos e instrumentos utilizados são os mesmos, assim como foram os métodos e instrumentos de Ptolomeu e Copérnico, distantes um do outro por séculos. O que muda é *o entendimento do fenômeno*. O que os adeptos da MWI propõem é *outra explicação*. Uma explicação fundada no realismo, isenta de metáforas e analogias.

Voltemos ao experimento: sabemos que, quando um fóton passa por qualquer uma das quatro fendas, alguma coisa[223] interfere em sua passagem, desviando-o para pontos da parede aparentemente aleatórios. Alguma coisa, contudo, passa pelas outras fendas, colidindo com o único fóton enviado. Essa "coisa", seja lá o que for, não pode ser vista ou detectada diretamente, mas demonstra sua presença. O que seria essa "coisa"? Conforme explica Deutsch, *é exatamente outro fóton, mas não da mesma natureza dos fótons enviados*:

> **I shall now start calling the interfering entities "photons". That is what they are, though for the moment it does appear that photons come in two sorts, which I shall temporarily call *tangible* photons and *shadow* photons. Tangible photons are the ones we can see, or detect with instruments, whereas the shadow photons are intangible (invisible) – detectable only indirectly through their interference effects on the tangible photons (…) What we have inferred so far is only that each tangible photon has an accompanying retinue of shadow photons, and that when a photon passes through one of our four slits, some shadow photons pass through the other three slits. Since different interference patterns appear when we cut slits at other places in the screen, provided that they are within the beam, shadow photons must be arriving all over the illuminated part of the screen whenever a tangible photon arrives. Therefore there are many more shadow photons than tangible ones. How many? Experiments cannot put an upper bound on the number, but they do set a rough lower bound. In a laboratory the largest area that we could conveniently illuminate with a laser might be about a square metre, and the smallest manageable size for the holes might be about 10^{12} (one trillion) possible hole-locations on the screen. Therefore there must be at least a trillion shadow photons accompanying each tangible one (DEUTSCH: 1996: pg. 43-44).**

Os *fótons sombra* seriam, portanto, indetectáveis por medidores, mas seus efeitos podem ser constatados sobre os fótons tangíveis que os acompanham. Para

[223] Coisa essa que não deveria ser outro fóton identificável, uma vez que os estamos enviando um por vez.

cada fóton enviado, pelo menos um trilhão de fótons sombra o acompanham. O fenômeno da interferência ocorre, de forma demonstrável experimentalmente, com qualquer tipo de partícula. Conforme Deutsch:

> **Thus we have inferred the existence of a seething, prodigiously complicated, hidden world of shadow photons. They travel at the speed of light, bounce off mirrors, are refracted by lenses, and are stopped by opaque barriers or filters of the wrong colour. Yet they do not trigger even the most sensitive detectors. The only in the universe that a shadow photon can be observe to affect is the tangible photon that is accompanies. That is the phenomenon of interference. (...) Interference is not a special property of photons alone. Quantum theory predicts, and experiment confirms, that it occurs for every sort of particle. So there must be hosts of shadow neutrons accompanying every tangible neutron, hosts of shadow electrons accompanying every electron and so on. Each of these shadow particles is detectable only indirectly, through its interference with the motion of its tangible counterpart (DEUTSCH: 1996: pg. 44)**

Ao conjunto de partículas tangíveis, sejam elas fótons, nêutrons, elétrons, em suma, à realidade diretamente perceptível em sua totalidade, damos o nome de *universo*. Tais partículas interagem entre si e compõem o que chamamos de *matéria*. Pois bem: os adeptos da MWI definem as partículas sombra como pertencentes a *outros universos*. Conforme Deutsch:

> **(...) they do not form a single, homogeneous parallel universe vastly larger than the tangible one, but rather a huge number of parallel universes, each similar in composition to the tangible one, and each obeying the same laws of physics, but differing in that the particles are in different positions in each universe. (DEUTSCH: 1996: pg. 45)**

Poderíamos, evidentemente, chamar o conjunto de todos esses supostos universos de “universo”, mas essa nova definição entraria em choque com a já vigente, de modo que adotaremos doravante a expressão *multiverso* como sendo a reunião de todos os universos – o nosso e os supostos universos paralelos. Cada universo afeta o outro de modo extremamente fraco, apenas o suficiente para ser percebido em experimentos de interferência.

Eis um problema: o fenômeno de interferência é incontroverso, mas a MWI é assumida como verdadeira apenas por uma minoria de físicos. A larga maioria adere à interpretação de Copenhague (*Copenhagen interpretation* - CI). Ocorre que essa maioria adepta da CI, conforme argumentam os adeptos da MWI, parte de *pressupostos metafóricos*. Dizer que o fóton se comporta *como se* estivesse colidindo com fótons virtuais nada explica sobre o comportamento do fóton. Dizer

que a luz se comporta *como se* fosse ao mesmo tempo onda e partícula nada mais é do que assumir que não se sabe explicar o comportamento da luz. Salva-se a situação através de uma metáfora que em todos os casos afirmará: *é como se...*

Adeptos da MWI, por sua vez, assumem uma posição ontologicamente realista que exclui o *como se* e qualquer outro recurso metafórico ou analógico. Conforme diz Deutsch:

> **(...) The key fact is that a real, tangible photon *behaves differently* according to what paths are open, elsewhere in the apparatus, for something to travel along and eventually intercept the tangible photon. Something does travel along those paths, and to refuse to call it "real" is merely to play with words. "The possible" cannot interact with the real: non-existent entities cannot deflect real ones from their paths. If a photon is deflected, it must have been deflected by something, and I have called that thing a "shadow photon". Giving it a name does not make it real, but it cannot be true that an actual event, such as the arrival and detection of a tangible photon, is caused by an imaginary event such as what that photon "could have done" but did not do. It is only what really happens that can cause other things really to happen. If the complex motions of the shadow photons is an interference experiment were more possibilities that did not in fact take place, then the interference phenomena we see would not, in fact, take place (DEUTSCH: 1996: pg. 48-49).**

Assumindo que a MWI seja verdadeira, teríamos então as seguintes peculiaridades: (1) existem múltiplos universos. Não se sabe se os universos são, como propõe Lewis em seu realismo modal, infinitos. Mas, de acordo com Deutsch, é possível estabelecer um número mínimo de um trilhão; (2) toda partícula possui contraparte em outro universo; (3) a interferência ocorre apenas entre partículas de mesma natureza. Um fóton tangível não será afetado, digamos, por um nêutron de outro universo; (4) a interferência só é detectada quando se dá entre partículas de universos muito semelhantes. No específico experimento descrito anteriormente, a diferença entre os fótons paralelos é de posição. Em um hipoteticamente existente universo no qual a velocidade da luz seja diferente, o fóton paralelo não afetará o fóton de nossa realidade; (5) As partículas de nosso universo são, por sua vez, partículas sombra em universos paralelos; (6) Como o conjunto de partículas forma o que conhecemos como "matéria", neste preciso momento há pelo menos um trilhão de versões do leitor lendo trilhões de versões da presente tese, escrita por um trilhão de versões alternativas do autor. Mas, contrariando Lewis, nenhum Harry Potter ou Drácula reais. O Big Bang não criou um universo, mas incontáveis outros, cuja existência podemos identificar pelo fenômeno da interferência. A suposição

cosmogônica de Jonas se realiza não em um único cenário, mas o jogo e a *chance* se realizam em pelo menos um trilhão de cenários-outros.

2.6. Sobre apostas.

À guisa de uma conclusão, antecipamos possíveis perguntas reativas aos tópicos trazidos pelo presente capítulo: cabe à filosofia ser especulativa? Uma boa resposta é oferecida por Jonas, quando diz que a proibição da metafísica reflete uma tentativa, por parte da filosofia, de imitar as ciências naturais. Os "voos de pensamento" que a filosofia possibilita, contudo, deveriam ser executados de tempos em tempos, aventura típica daquilo que Jonas chama de *philosophia perennis*, exercitada por Platão, Spinoza, Hegel, Leibniz e muitos outros que ousaram especular a respeito do universo (JONAS: 1996: pg. 193-194). Pois bem, podemos acrescentar que se todos esses personagens da filosofia clássica especularam a partir de suas ricas intuições, não faz sentido que nos esquivemos dessa tarefa. Sobretudo em vista do fato de que possuímos dados cosmológicos que eles, em sua época, não possuíam, tais quais as constantes físicas aqui expostas e o nosso entendimento da física quântica, dados esses que nos permitem intuições mais acertadas. Cabe também dizer que, não raro, os próprios físicos teóricos contemporâneos aventuram-se sem o menor constrangimento por dimensões especulativas. Sendo assim, não faz sentido algum que se cobre justamente da filosofia um interdito no que tange ao exercício da especulação. Fazê-lo seria tentar matar o *espanto*, força motriz da motivação filosófica desde seus primórdios. Ademais, conforme sustentado desde o início deste capítulo, nada do que aqui se expõe pretende ter o valor de uma verdade metafísica. O que se propõe é um sistema fundado na interpretação de dados físicos.

Pode-se também questionar: qual a relevância em evocar tais questões em uma tese que se propõe a conclusões de ordem ética? Conforme já dito, a ética não prescinde de uma metafísica, embora seja possível elaborar uma aposta a partir de elucubrações desse gênero. Como o faz Pascal[224], por exemplo, quando em seus *Pensées* nos diz que é melhor apostar na existência de Deus, pois o que está em jogo são ganhos ou perdas infinitos:

[224] Blaise Pascal (1623-1662), matemático, físico e teólogo francês.

> **(…) you must wager. It is not optional. You are embarked. Which will you choose then? Let us see. Since you must choose, let us see which interests you least. You have two things to lose, the true and the good; and two things to stake, your reason and your will, your knowledge and your happiness; and your nature has two things to shun, error and misery. Your reason is no more shocked in choosing one rather than the other, since you must of necessity choose. This is one point settled. But your happiness? Let us weigh the gain and the loss in wagering that God is. Let us estimate these two chances. If you gain, you gain all; if you lose, you lose nothing. Wager, then, without hesitation that He is. "That is very fine. Yes, I must wager; but I may perhaps wager too much." Let us see. Since there is an equal risk of gain and of loss, if you had only to gain two lives, instead of one, you might still wager. But if there were three lives to gain, you would have to play (since you are under the necessity of playing), and you would be imprudent, when you are forced to play, not to chance your life to gain three at a game where there is an equal risk of loss and gain. But there is an eternity of life and happiness. And this being so, if there were an infinity of chances, of which one only would be for you, you would still be right in wagering one to win two, and you would act stupidly, being obliged to play, by refusing to stake one life against three at a game in which out of an infinity of chances there is one for you, if there were an infinity of an infinitely happy life to gain. But there is here an infinity of an infinitely happy life to gain, a chance of gain against a finite number of chances of loss, and what you stake is finite. It is all divided; where-ever the infinite is and there is not an infinity of chances of loss against that of gain, there is no time to hesitate, you must give all. And thus, when one is forced to play, he must renounce reason to preserve his life, rather than risk it for infinite gain, as likely to happen as the loss of nothingness (PASCAL: 2003: 233)**

Conforme se pretende argumentar a seguir, há uma aposta em jogo, mas nela sujeito e objeto se invertem em relação à clássica aposta de Pascal. Não é o tipo humano que precisa apostar na existência de Deus. É Deus quem, desde os primórdios, aposta na existência do tipo humano. Voltando a Jonas, entenderemos que é efetivamente Deus, *se* considerarmos sua existência, quem depende de nós. E, a partir daí, sustenta-se o imperativo evocado por Huxley, pai do transumanismo contemporâneo: *não temos mais direitos do que os outros seres, mas sim uma responsabilidade maior no quadro da existência*. E esta responsabilidade, conforme transumanistas como Gardner e Kurzweil, é disseminar vida e consciência através do universo, aumentando as chances de sua sobrevivência, impedindo a derradeira entropia. Huxley não aborda tais ideias em seu artigo original, embora tangencie a proposta da emergência de um universo desperto em sua introdução ao *Phenomenon* de Chardin.

Mas que Deus é este a quem esta tese se refere? Trata-se de palavra complicada, considerando a multiplicidade de significados que emergem quando a evocamos. Conforme se verá, é admissível que tenha existido, e é altamente

provável que tenha voluntariamente renunciado ao próprio poder para *jogar um jogo sem garantias de êxito*. Sigamos, portanto, rumo aos devidos esclarecimentos:

É possível resumir o argumento ontológico de Anselmo na proposição *Deus existe na mente como uma ideia; logo, Deus necessariamente existe na realidade*. Levando em conta que mesmo um ateu possui a ideia de Deus em sua mente, logo, para Anselmo, a existência da divindade é ontologicamente inescapável. Por sua vez, alguns transumanistas defendem que *Deus existe na mente como uma ideia; logo, Deus existirá na realidade*, o que constitui um deslocamento temporal do argumento ontológico: a ideia de Deus não deriva de sua prévia existência, mas revela sobretudo o desejo de fazê-lo existir. Conforme já dito, os mitos, repletos de deuses e criaturas híbridas, não constituiriam apenas metáforas, mas anseios, e mesmo os santos das religiões monoteístas rivalizam com as antigas divindades pagãs quando o assunto é executar feitos sobrenaturais. Para onde conduz este anseio que nos movimenta enquanto espécie cada vez mais na direção de um – ao mesmo tempo perigoso e maravilhoso – melhoramento capaz de nos converter em algo além do humano? Conforme vimos ao longo deste capítulo, alguns autores – como Gardner e Chardin, para citar apenas dois – pressupõem que tudo se encaminha para a criação de uma super-mente. Ainda que existam diferenças[225] acerca deste processo, pontos em comum se desenham: realização divina que se dá no âmbito da imanência, brotando da matéria; otimismo fundado na crença de que tal realização é inescapável, sobretudo se considerarmos a perspectiva de Lewis acerca dos infinitos mundos onde tudo o que pode ser, será. Sob a perspectiva de tais garantias, o que nos resta senão a confiança cega de que nada precisamos fazer? Ou caminhamos destinados ao ponto ômega de Chardin, ou seguimos em paz diante da crença de que a eventual miséria presente nesta realidade pouco importa, dado que este é apenas mais um dentre infinitos universos onde a potência se realiza em todas as suas chances. Não importa que arremessemos um dado, obtendo “1” como resultado, pois em algum universo os números serão outros. Diante de tal especulação, por que haveria alguém de lutar por qualquer coisa que fosse?

Não são raros os transumanistas que se posicionam com variados graus de otimismo diante da perspectiva da singularidade tecnológica, evento que marca a

[225] Para Chardin, trata-se de *Ouroboros*: alcançar o ômega, que por sua vez retorna ao alfa; para Gardner, o nascimento de uma super-mente divina

emergência de uma superinteligência artificial capaz de se aperfeiçoar. As implicações disso para a sociedade envolvem cenários geralmente otimistas, marcados pela superação do envelhecimento, o banimento das doenças, a longevidade indefinida, e até mesmo a emergência de super-habilidades. Mas para onde tudo isso conduz? Para muitos transumanistas, há uma causa final, e ela é a transformação do universo em que nos encontramos em uma entidade viva e capaz de se reproduzir, criando universos-bebês, em um processo infinito de constante recriação. Eis, por exemplo, a aposta otimista de Gardner, explicitada de forma bastante clara a respeito do que seria *nosso destino*:

> **We and other living creatures throughout the cosmos are part of a vast, still undiscovered transterrestrial community of lives and intelligences spread across billions of galaxies and countless parsecs who are collectively engaged in a portentous mission of truly cosmic importance. Under the Biocosm vision, we share a common fate with that community – to help shape the future of the universe and transform it from a collection of lifeless atoms into a vast, transcendent mind (GARDNER *apud* KURZWEIL: 2005: pg. 361-362).**

Sob esta perspectiva transumanística, o melhoramento humano não visa a atender nossas vaidades, nem o mero desejo de poder ou o medo da morte, mas se trata de uma estratégia da inteligência, cujas características inatas a impelem a: (1) um impulso de sobreviver o máximo que puder, evitando o *summum malum* jonasiano; (2) um impulso de se espalhar. Vejamos o que diz, por exemplo, Kurzweil[226], para quem a inteligência constitui a mais poderosa força presente do universo, capaz de superar a entropia final, buscando assim a própria sobrevivência:

> **How relevant is intelligence to the universe? (…) The common wisdom is *not very*. Stars are born and die; galaxies go through their cycles of creation and destruction; the universe itself was born in a big bang and will end with a crunch or a whimper, we're not yet sure which. But intelligence has little to do with it. Intelligence is just a bit of froth, and ebullition of little creatures darting in and out of inexorable universal forces. The mindless mechanism of the universe is winding up or down to a distant future, and there's nothing intelligence can do about it. That's the common wisdom. But I don't agree with it. My conjecture is the intelligence will ultimately prove more powerful than these big impersonal forces (…) So will the universe end in a big crunch, or in an infinite expansion of dead stars, or in some other manner? In my view, the primary issue is not the mass of the universe, or the possible existence of antigravity, or of Einstein's so-called cosmological constant. Rather, the fate of the universe is a decision yet to be made, one which will intelligently consider when the time is right (KURZWEIL: 1999: pg. 258-260).**

[226] Raymond Kurzweil (Born in 1948), transumanista norte-americano.

A emergência da mente cósmica seria, portanto, movida pelo mesmo imperativo de qualquer vida: sobreviver o máximo que puder. O que, no caso do universo, envolveria reproduzir-se através de buracos negros. Ainda conforme Kurzweil:

> **Leonard Susskind, the discoverer of string theory, and Lee Smolin, a theoretical physicist and expect on quantum gravity, have suggested that universes give rise to other universes in a natural, evolutionary process that gradually refines the natural constants. In other words it is not by accident that the rules and constants of our universe are ideal for evolving intelligent life but rather that they themselves evolved to be that way. In Smolin's theory the mechanism that giver rise to new universes is the creation of black holes, so those universes best able to produce black holes are the ones that are most likely to reproduce. According to Smolin a universe best able to create increasing complexity – that is, biological life – is also most likely to create new universe-generating black holes. As he explains, "Reproduction through black holes leads to a multiverse in which the conditions for life are common – essentially because some of the conditions life requires, such as plentiful carbon, also boost the formation of stars massive enough to become black holes". Susskind's proposal differs in detail from Smolin's but is also based on black holes, as well as the nature of "inflation", the force that caused the very early universe to expand rapidly (KURZWEIL: 2005: pg. 360).**

Poderíamos dizer, portanto, que nosso próprio universo deriva de um universo anterior, inteligente, que se reproduziu na forma de um universo-bebê cujas constantes físicas favorecem a emergência da vida e da consciência. Tal inteligência gera nosso universo e, conforme Deutsch, provavelmente incontáveis outros ao mesmo tempo, em um processo randômico, darwinista, que culminará na emergência da vida em alguns universos, no surgimento da consciência em vários, e talvez na conversão de alguns em super-mentes capazes de se reproduzir. E, ainda conforme essa hipótese, em muitos universos nada acontece. A chave, aqui, é compreender que, ao contrário da aposta de Chardin e da hipótese de Lewis de que tudo o que pode ser efetivamente será, não há garantia de êxito. Mas, considerando que o nosso próprio universo biofílico existe, poder-se-ia apostar na existência prévia de uma super-mente geradora. O êxito ocorreu, e tenta se replicar através de nós. Tal perspectiva revisita o argumento ontológico de Anselmo, e explica que talvez a ideia inata de Deus derive do fato de que fomos, sim, criados por uma inteligência pré-existente. Considerar a plausibilidade dessa proposta, contudo, não implica crer que tal inteligência possua atributos antropomórficos, nem que atenda às nossas orações, tampouco que seja bondosa ou moral no sentido dado pelas religiões humanas. Em verdade, a aposta da presente tese está em consonância

com a suposição cosmogônica sustentada por Jonas: se houve um Deus, este se despiu de sua potência para que nosso universo pudesse existir, *ou* preserva suas qualidades divinas, mas não pode interferir. Trata-se do que aqui se descreveu como uma aposta de Pascal invertida: não somos nós que temos que apostar na existência de Deus, mas é Deus quem efetivamente aposta tudo em nós. Conforme Jonas:

> **As our first proposition we say that the self-divesting of mind at the beginning was more serious than the cheerful prophet of reason was willing to admit. He abandoned Himself and His destiny entirely to the outwardly exploding universe and thus to the pure chance of *possibilities* contained in it under the conditions of space and time. Why He did this remains unknowable. *We are allowed to speculate that it happened* because *only* in the endless play of the finite, and in the inexhaustibility of chance, in the surprises of unplanned, *and* in the distress caused by mortality, can mind experience itself in the variety of its possibilities. For this the deity had to renounce His own power. (…) From all this, the fact follows that the destiny of the divine adventure is placed in our unsteady hands, in this earthly corner of the universe, and that the responsibility for it rests in our own shoulders. So the deity, I imagine, must become anxious about His own cause. There is no doubt that we have the power in our hands to thwart the purpose of creation – and this precisely in its apparent triumph in us – and that we are perhaps energetic in doing so. (…) By the events of Auschwitz and from the rather of safe harbour of not having been there, wherefrom one can easily speculate, I was impelled to the view, which every doctrine of faith would probably find heretical, that it is not God who can help us, but we who must help God (JONAS: 1996: pg. 189-191).**

Para sustentar seu pensamento, Jonas nos conta a história da judia holandesa Etty Hillesum (1914-1943), que se dirigiu voluntariamente a um campo de concentração, a fim de ajudar seu povo. Hillesum morreu assassinada na câmara de gás em Auschwitz. Um específico excerto de seu diário exemplifica bem a suposição teológica de Jonas:

> **(…) and if God does not continue to help me, then I must help God (…) I will always endeavour to help God as well as I can (…) I will help you O God, that you do not forsake me, but right from the start I can vouch for nothing. Only this one thing becomes more and more clear to me: that you cannot help us, but that we must help you, and in so doing we ultimately help ourselves. That is the only thing that matters: to save in us, O God, a piece of yourself. Yes, my God, even you in these circumstances seem powerless to change very much (…) I demand no account from you; you will later call us to account. And with almost every heartbeat it becomes clearer to me that you cannot help us, but that we must help you and defend up to the last your dwelling within us (HILLESUM *apud* JONAS: 1996: pg. 192).**

Com esta aposta metafísica, concluem-se as suposições deste capítulo. *Se* – e que se ressalte, aqui, o teor de suposição – existe ou existiu um Deus, ou super-

mente, ou qualquer que seja o nome que desejemos dar a esta vasta inteligência, Ele joga um jogo e aposta suas fichas nos seres conscientes que emergem na dinâmica biofílica do universo. Mas se este não é um Deus certo de seu êxito, como pressupõe Chardin (e de certa forma também Gardner), ele também não se arrisca tanto quanto Jonas originalmente concebeu, posto que a expansão primordial gerou não apenas um, mas muitos outros universos onde o jogo também é jogado e, por consequência, as chances são expandidas.

Desta aposta em um Deus que não provê, que não garante, que se faz voluntariamente oni(m)potente, derivam a ética e a proposta nomotética desta tese: ainda que tenha havido uma inteligência criadora a quem chamamos “Deus”, não há nada que Deus possa fazer por nós, mas somos nós quem devemos ajudar a Deus. Muitas críticas metafísicas podem ser feitas contra a suposição cosmogônica de Jonas acerca de um Deus que voluntariamente abdica de sua onipotência para que o universo possa existir. Faria sentido um Deus que sofre desde a criação do universo, sacrificando a si próprio com base em uma motivação inescrutável? Um Deus que se lança a um jogo cujos resultados lhe são imprevisíveis, e, portanto, também não pode ser chamado de onisciente? Dispondo-se a tamanha imperfeição, poderíamos chamá-lo de “Deus”? Tais questionamentos permitiriam uma tese inteira sobre metafísica, plena de bons contra-argumentos extraídos de filósofos os mais diversos, o que não é a proposta aqui. Até porque, nada indica que Jonas quisesse efetivamente criar alguma forma de consolação metafísica, mas sim propor um modelo ético a partir do qual a humanidade assume inteira responsabilidade pelo curso de suas ações.

É possível sustentar que aquilo que chamamos de “mal” existe apenas como nossa própria limitação cognitiva diante dos planos grandiosos da divindade, mas convenhamos que tal argumento demanda fé, ou pelo menos um considerável grau de otimismo diante de hecatombes como a de Auschwitz. Também é possível sustentar que Deus nem mesmo existe, a não ser como um mito cujo efeito é consolador, um pensamento desejoso metafísico. No primeiro caso, temos o risco de uma perigosa resignação, afinal para que e pelo que lutar, se tudo o que ocorre está nos plano divinos? No segundo caso, há o risco de niilismo. Haveria uma alternativa a esses extremos?

Em Jonas, somos apresentados a uma terceira via: a de um Deus que abdica de seu poder. Ele existiu antes do universo, mas só atuou na criação, e nada mais.

O que se oferece aqui é outra suposição cosmogônica, parcialmente amparada nas hipóteses de Jonas. Não um Deus que sofre, mas que joga e se insere no jogo na forma de consciência, a fim de experimentar tudo o que for possível. Conforme aponta Hawking[227], apesar de Einstein ter certa feita dito que “Deus não joga dados com o cosmo”, as evidências físicas apontam para o exato oposto: se existe um Deus, ele é um grande apostador, e o universo (ou multiverso) é como um cassino gigante, cujos dados rolam e a roleta gira a todo momento (HAWKING: 2018: pg. 75). E mais: se considerarmos a suposição cosmogônica de Jonas como válida e aplicarmos sobre ela a interpretação dos muitos mundos conforme defendida por Deutsch, consideraremos que Deus não apenas joga, como o faz em incontáveis cenários (universos alternativos), ampliando assim suas chances de êxito. Ampliar as chances, ressalte-se, não significa garantir sucesso. Se um dado é jogado em um trilhão de cenários alternativos, é altamente provável que obtenhamos como resultado todos os números possíveis, mas tais resultados não são garantidos. Não há nenhum impedimento lógico de que o dado resulte sempre no número “1” em um trilhão de universos (número mínimo estabelecido por Deutsch), nem mesmo em infinitos deles (conforme Lewis).

[227] Stephen William Hawking (1942-2018), físico e cosmologista inglês.

3. Conclusões

Then he (the Starchid) waited, marshalling his thoughts and brooding over his still untested powers. For though he was master of the world, he was not quite sure what to do next. But he would think of something.[228]

Não obstante tenha corretamente revisto o conceito hobbesiano de *summum malum* ao apresentá-lo como "extinção da espécie", Hans Jonas permanece atrelado a uma perspectiva geocêntrica no que tange à vida e estabelece a Terra como "destino final da humanidade", o que constitui contradição. As evidências científicas obtidas no fim do século XX demonstram que nosso mundo está sujeito a eventos de extinção em massa, de modo que qualquer concepção do planeta Terra como um lugar ao qual devemos estar restritos é inaceitável. Tal concepção apenas agrava o risco de extinção, que é justamente o mal supremo a ser evitado. A *heurística do medo* proposta por Jonas é razoável e a regulação do desenvolvimento tecnológico humano é fundamental. Contudo, os riscos postos pela tecnologia constituem um conjunto de probabilidades que são menos perigosas em comparação à certeza da destruição causada por eventos cósmicos aleatórios sobre uma humanidade desprovida de recursos para defender-se. Um uso responsável da tecnologia não cancela totalmente os riscos, mas aumenta bastante as chances da sobrevivência da espécie para além dos limites planetários.

De modo a sobreviver a longo prazo, a humanidade deve entender a Terra não como *destino final*, mas como *ponto de partida*, a partir do qual uma biosfera expandida além dos limites planetários possa ser criada. Em contraste com a ética cristã, guiada pela esperança, a ética transumanista é aqui definida como uma *ética do des-espero*, dado que é necessário agir de modo a criar o Paraíso Terrestre ao invés de esperar por uma possível, mas improvável, graça divina. O senso de *responsabilidade*, conforme evocado por Julian Huxley, não demanda fé nem esperança, mas uma ação antecipada que leve em consideração que nós humanos não somos dotados de mais privilégios, mas de mais deveres, não apenas entre nós, mas também entre nossa espécie e as outras. Além disso, a ética transumanista não considera a atual forma humana como a última forma que a consciência pode assumir. De modo a sobreviver além das limitações da Terra, a

[228] CLARKE, A. *2001 - A Space Odyssey*.

humanidade (ou ao menos parte dela) precisa se tornar *outro ser*. É eticamente imperativo que a espécie humana sobreviva ao fim do mundo e, para fazê-lo, é preciso que se torne transumana. Devemos sobreviver não porque a *forma humana* tem valor intrínseco, mas porque nossa consciência tem valor intrínseco e, graças à nossa inteligência, somos capazes de defender a vida e espalhá-la cosmo afora.

É possível também sustentar a importância de nossa sobrevivência a partir de uma perspectiva metafísica (o que implica uma aposta). No fim das contas, conforme destaca Jonas, ainda que exista um Deus, Sua onipotência foi voluntariamente sacrificada. Ao contrário da aposta de Pascal, é Deus quem aposta em nós, e, conforme demonstrado pela interpretação de muitos mundos, tal aposta se dá em incontáveis universos alternativos, mas sem garantia de sucesso. Logo, é nossa obrigação moral agir de modo a espalhar a vida pelo universo, favorecendo assim a emergência da consciência cósmica.

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