THE IMPORTANCE OF STORYTELLING AND SPECULATIVE FICTION IN THE TRANSITION INTO A POSTHUMAN ECOSYSTEM

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Abstract

Storytelling is one of the most powerful tools the *Homo sapiens* species have at their disposal. Considered one of the oldest forms of art and an evolutionary adaptation for survival, storytelling will surely have an important role in the challenging transition into a posthuman ecosystem. This article argues that *Homo sapiens* will eventually evolve and fragment into other species much due to our natural proclivity towards enhancing technologies; we propose that empathic storytelling might be paramount to reduce otherness and othering in-between human, transhuman, and posthuman sentient beings. The importance of storytelling as a deterrent for othering future complex artificial intelligence, augmented humans, and posthuman species has not been properly explored and studied in-depth, therefore, we collected data and points of view on vital concepts pertinent to the discussion. This paper's main goals are to contribute to the debate of storytelling and posthumanism and to understand how the action of telling empathic, appealing, and engaging stories, be it through books, moving images, or videogames could be used for the betterment of future societies and their relations. We concluded that by creating and disseminating big quantities of beautiful, touching, empathic, direct from the heart, speculative, truthful, and thought-provoking stories, in all available media, it is possible to combat the nefarious act of othering and prepare contemporary societies for the emergence of transhuman and posthuman species; we further argue that speculative fiction and audiovisual content production systematically explores concepts such as androids, artificial intelligence, cyborgs, robots, and what it means to be human, making them an efficient genre and media to achieve the above-mentioned inspiring goal of connecting people empathically and reducing future othering.

Keywords: Evolution, Otherness, Posthuman, Speculation, Storytelling, Technology.

The importance of storytelling and speculative fiction in the transition into a posthuman ecosystem

People can be divided into technophilic, technophobic, and technoexcluded categories, and all the levels in-between such broad categorizations, not forgetting that access to technology can be influenced by religious, social, and economic reasons; although this does not mean we are substantially different from one another it will influence our collective future because of the way different people perceive technological advancement. Some will embrace it while others will not be allowed to do so; others will fear or ignore it.

Several extinct hominids, predating *Homo sapiens*, used technologies that had a crucial role in the *Homo* genus fragmentation and evolution. Our current dependence on technology and the impact it has on our minds and bodies allow the speculative assumption that technology will once again be a catalyst in humankind's history.

The art of telling stories is culturally and socially significant to our species. Concepts such as artificial intelligence, androids, cyborgs, and robots, so often explored in literature, comics, videogames, television, and cinema, are of the utmost importance for the speculative exercise of predicting possible futures where our species interact with several other species and sentient beings. These concepts and these stories might allow for a less destructive transition into a posthuman ecosystem, preparing large sections of the population for change and inevitable technological progress.

This paper is divided into six chapters. The first chapter is about technology and its role in human evolution. The machines we build will surely have an important function in our future evolution and augmentation and the rise of sentient and self-aware artificial intelligence. Richard Wrangham's *cooking hypothesis* allows us to speculate that technologies and tools are more important to our evolution than we think and have been more prevalent since before the emergence of *Homo sapiens*. This chapter explores the relation between Man and technology and evolution through the perspective of several philosophers and futurists such as Edward O. Wilson, Walter Benjamin, Bernard Stiegler, Martin Heidegger, Don Ihde, Chris Gray, Douglas Engelbart, Marshall McLuhan, Alan Turing, and Ray Kurzweil, among others. To speculate about possible and plausible future posthuman ecosystems it is necessary to understand how technology has been changing our species since the Stone Age.

The second chapter is about the Kurzweilian speculative view of our biological and technological evolutionary history. Ray Kurzweil believes that technological evolution is a continuation of our biological evolution and that our destiny is to spread humankind's computational intelligence throughout the universe. This chapter explores the author's technophilic point of view and Paul Allen, Mark Greaves, and Nick Bostrom's contrary point of view, showing that every story about the future of our species and its evolution (be it progressive or regressive) is always a speculative exercise: that does not mean these stories are not relevant. They are. Sohail Inayatullah's definition of futures studies and the importance of theoretical and conceptual frameworks to study and even change possible futures are pertinent to develop a vision of a better future and a well-balanced posthuman ecosystem.

The third chapter is about art and evolution and how art, specifically the art of storytelling, could be a human adaptation for survival. In this chapter, we define *art* by using the *institutional theory* of George Dickie, and we explore the connection between art and technology since the Stone Age. Furthermore, according to Dennis Dutton, our artistic drive can be understood as an evolutionary instinct. If art and human evolution are connected, it is possible to speculate that creative storytelling, through multiple media, might be the most important tool we have at our disposal to deal with the problematic transition into a posthuman ecosystem; our need for beautiful artistic artifacts and works of art might save us from our worst and ugliest instincts.

Beauty and sublime from an artistic and scientific point of view are also addressed in this chapter through the notions of Kant, Mark L. Johnson, Jeremy Gilbert-Rolfe, and Dennis Dutton. Dostoyevsky's quote "beauty will save the world" is very much pertinent for the central argument of this paper.

The fourth chapter investigates the concept of otherness and the monster archetype, and, because monsters have been such an important part of our myths and storytelling strategies, it is important to understand how monstrification (othering on steroids) is used in our stories, especially in speculative fiction, which is a very important informative, transformative, and expansive genre. This chapter defines *speculative fiction* and explores the definition of *otherness* by Jean-François Staszak, the *anthropological machine* by Giorgio Agamben, and how to categorize othering by authors such as Erving Goffman, Rosemarie Garland-Thompson, Aidan Diamond, and Lauranne Poharec. To create better, positive, and empathic stories that might allow a proper transition into a posthuman ecosystem it is necessary to understand how othering is used in stories and in real life.

The fifth chapter explores the importance of storytelling, storylistening, and myth and how empathic storytelling could be the best tool we have at our disposal to attenuate the problems of a posthuman world and dissipate otherness and othering. The unique perspective of Patricia Manney about the importance of storytelling for future transhuman societies is paramount to this chapter and the paper. Brian Boyd's history of the evolution of language, storytelling, and the human mind complements Manney's perspective. Zoltán Simon's historical assessment of the relationship between humanism and posthumanism helps understand the current view on the matter. To comprehend storylistening and myth in a way that is relevant to the main goal of this paper, we relied on the insights of Brian Sturm, Claude Lévi-Strauss, and Tom Lombardo.

The last chapter tackles the concepts of artificial intelligence, androids, cyborgs, and robots, and their importance in our stories, our lives, and how the future might be. We are all natural-born cyborgs due to our inherited proclivity towards technology and that will only increase in the next few decades. What we usually saw only in movies and TV series is now a part of our daily lives; the next few decades will be an important transition period into a posthuman ecosystem where several sentient species will probably share the planet.

Technology and evolution

The relationship between mankind and technology developed gradually in the last hundreds of thousands of years with some important historical events happening sporadically. Since the Industrial Revolution, science and technological developments have accelerated, and since the First World War, the acceleration has been somewhat *meteoric*. American scientist Edward O. Wilson, in a 2009 debate at the Harvard Museum of Natural History, claimed that the "real problem of humanity is the following: we have Paleolithic emotions, medieval institutions and god-like technology" (as cited in Ratcliffe, 2016). Technology is part of us but, unfortunately, the fast and demanding developments of the last century have had negative side effects on several levels, in populations and on the planet; philosopher Walter Benjamin, in his short text *To the Planetarium*, stated that technology should not be the subjugation of nature by Man, but the control of the relationship between mankind and nature (1979, p. 104). In this sense, we should use our knowledge, our storytelling abilities, and even the technologies we have developed to avoid a *suicidal* Anthropocene. Technological transitions have been too fast, and we are visibly overwhelmed by the complexity of the world we have created for ourselves, but that is part of our evolution path. The paradox of contemporary technics is that it represents "human power" and, at the same time, "the power for the self-destruction of humanity" (Stiegler, 1998, p. 85). We need to outgrow this dangerous binary representation of technics and focus on a balanced, empathic, and respectful "human power".

Evolution is "the process by which new species or populations of living things develop from preexisting forms through successive generations" (Merriam-Webster, n.d., Definition 1a). Charles Darwin, famous for being the author of the game-changing book *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, published in 1859, was not the first to develop such an idea. The concept is much older and is attributed to the writer Al-Jahiz, the first to present a theory of biological evolution (Bayrakdar, 1983, p. 307). Although the concept of human evolution is still controversial due to religious beliefs and political opportunism, it has become a popular paradigm in both casual or more science-oriented conversations.

Man, not unlike other animals, is continually evolving into something else, but, in our case, technology is undoubtedly a factor to take into consideration. *Homo sapiens* is a technological animal since it came into being as an autonomous species: an interesting fact about the lithic industry and the controlled use of fire is that both technologies predate our species and were particularly important in our evolutionary path. Primatologist Richard Wrangham, with his *cooking hypothesis*, explained the radical evolution inside the *Homo* genus, specifically from the *Homo habilis* to the *Homo erectus*. The use of fire to cook food permitted the chewing process to be more efficient, thus reducing the energetic expenditure of digestion and the necessity of a more capable immune defense system due to the ingestion of raw meat. This allowed humans to obtain higher energetic value from food, resulting in less time wasted in eating and, possibly, "brain size increase" (2017, p. 308). If this hypothesis is correct, a direct correlation between technology and evolution within the *Homo* genus has already happened before. Wrangham also reflects on how the lithic industry could have initiated this process: the *Homo habilis* was able to soften food mechanically, by using stone instruments to "cut and pound food" before ingesting it (2017, p. 310).

Language is an important hallmark of our biological evolution. Many animals have this ability, but our species was able to evolve beyond the rudimentary communication of other animals, contributing to the hegemony of our species and the invention of many important technical achievements. There is a correlation between our species' softer foods diet with the evolution of our teeth and jaw, suggesting it altered our speech biomechanics; after the rise of agriculture and the invention of food processing technologies (e.g., milling and fermentation), our mouth's anatomy evolved, resulting in a larger diversity of speech sounds (Bickle et al., 2010). This is another example of how technological achievements influence our anatomy and one of the most important ways of communication we have: language.

The future evolution of Man is intertwined with the technologies we develop, and it will probably be accelerated by artificial means and technologies that could allow us to surpass our biological shortcomings. *Transhumanism* was coined in 1957 by biologist and philosopher Julian Huxley and can be defined as a "social and philosophical movement promoting the research and development of robust human-enhancement technologies" (Hays, n.d.). Transhumanism is an important steppingstone into posthumanism.

Philosopher Martin Heidegger, in his text *The Question Concerning Technology*, originally published in 1954, was aware that the prevailing conceptions of technology at the time were human activity ("anthropological definition"), and the means to achieve something ("instrumental definition") (1977, p. 5). For Heidegger, though, the essence of technology – in the technological age – is its capacity to *reveal* humankind truthfully while *concealing* itself (1977, p. 12–13, 22). Philosopher Don Ihde stated that "technology is actually *between* the seer and the seen, in a position of *mediation*". The devices he calls "corrective technologies", such as seeing glasses, hearing aids, and the probing cane for blind people, once they are embodied (through a process of habituation) they become

"transparent". These technologies and artifacts transform us, they become mediators between the user and the world, extending our bodily capacities ("naked capacities"). Ihde presents the example of the automobile, which, unlike the above-mentioned corrective technologies, involves "whole-body mobility". When driving a car we embody the machine, it becomes part of us; the system "driver-car" is the result of the extended abilities the car allows: "[o]ne embodies the car … in such activities as parallel parking: when well embodied, one feels rather than sees the distance between car and curb" (2003, p. 540–541).

A *protocyborg* is a cyborg – cybernetic organism – "that lacks full embodiment" (Gray, 1995, p. 14). The above-mentioned driver-car system could be defined as a protocyborg. Nowadays, millions of people use Internet-connected smartphones filled with intelligent apps; this Man-machine hybrid system can also be classified as a protocyborg. When people use Google Maps on their smartphones to find a certain place and navigate the intricate streets of a certain city, they are augmenting their abilities through a complex device, mixing virtual reality (VR) with real reality (RR), which results in augmented reality (AR). The blurring of lines between real and virtual environments will only increase in the next few years.

Inventor Douglas Engelbart, in his seminal 1962 text *Augmenting the Human Intellect: A Conceptual Framework*, presented the first phase of a program with the main goal of researching and developing means to augment the human intellect. Those means were technological extensions – like the computer – that would give people better skills to solve problems and increase their mental and motor abilities (1962, p. 1-7). Philosopher Marshall McLuhan, in his book *The Medium is the Massage*, stated that "electric circuitry" is "an extension of our central nervous system", and that any extension of our senses changes our way of acting and thinking, therefore, when our perception of the world changes, we change as well (1967, p. 40–41).

Psychologist and computer scientist Joseph C. R. Licklider, in his article *Man-Computer Symbiosis*, claimed that the symbiotic relationship between Man and computer would allow the first to become more efficient. Furthermore, he claimed that the "man-computer symbiosis" concept was different from the "mechanically extended man" concept, presented by Professor John D. North, in 1954, according to which the machine was but a mere extension of the human operator. Licklider believed that artificial intelligence would emerge from the advances of people and computers "working together in intimate association" (1960, p. 4).

Going further back, mathematician and computer scientist Alan Turing, anticipating areas such as *machine learning* and *deep learning*, stated in a public presentation, in 1947, that "what we want is a machine that can learn from experience" (as cited in Press, 2017). Today, this is a reality and intelligence augmentation (IA) and artificial intelligence (AI) are becoming intertwined. This might become more evident if scientists find a way to upload our minds into a computer: the resulting *mindware* (digital mind or mind-like software) would erase the frontier between IA and AI.

Alan Turing, Joseph C. R. Licklider, Marshall McLuhan, Douglas Engelbart, Don Ihde, Martin Heidegger, Chris Gray, and many others have studied the relationship between mankind and technology and made previsions that are now more visible or coming into fruition. Futurist Ray Kurzweil believes that by the mid-2020s we will be able to reverse-engineer our brain to better understand "the principles of human intelligence" and expand our ability to build artificial intelligence. These non-biological systems will "match human intelligence in the ways that humans are now superior", such as "our pattern-recognition abilities" (2011). By the 2030s, Kurzweil believes "the nonbiological portion of our intelligence will predominate". The *digital ascension*, or the upload of a human mind into a machine, if ever achieved, could allow mankind to accomplish an ancient goal: *immortality*. This dreamlike-goal, found in several ancient myths (e.g., ingesting mermaid meat

in Japan, eating magical peaches in China, drinking from the Holy Grail in the West), might be possible at the end of the 2030s (2006, p. 198-200). Kurzweil believes the fusion between Man and machine is inevitable, and that it will allow humans to transcend their limitations, including death: "[w]e will be able to live as long as we want" (2006, p. 9; 2011). After 2045, we will enter, according to Kurzweil, the *Singularity*: a term appropriated from physics, which aims to describe a historical moment after which it is difficult to understand what the future will look like.

It is arguably safe to speculate that the myriad of technologies we have at our disposal right now, and the ones being developed, will have an impact on how *Homo sapiens* evolves. We have, since the emergence of our species, been inclined into technology-driven evolution, propelling us into convergence with the tools we have imagined and built. For the author Timothy Taylor, "[t]echnology can and does supersede biology and lead us into a new form of life, one not primarily governed by Darwinian process. The implications of being the first entity on our planet to escape natural selection are immense" (2010, p. 8).

On the other hand, French archeologist André Leroy-Gourhan, believed that the system we call human, with its main characteristics (e.g.: "vertical posture, hand, tools, language"), has reached its full potential, except for the brain; for him it made sense that technology was used "to suspend the course of our evolution, at least for some time" (1993, p. 129-130). There are animal species that have supposedly reached their full potential and maintain their body shapes (more or less) for millions of years (e.g.: horseshoe crabs and crocodiles); this form stability could make sense if our species never leave our planet because when that happens our future bodies will have to be *redesigned* for space travelling and the characteristics of other telluric planets we might inhabit.

The six epochs of ray kurzweil and futures studies

Ray Kurzweil, with his "law of accelerating returns (the inherent acceleration of the rate of evolution)", defends that technological evolution is a continuation of biological evolution; the author also believes that *evolution* is a cumulative process of creating patterns and information and that the history of biological and technological evolution can be divided into six epochs (2006, p. 7, 14). The engaging story he tells through this theory is one of progressive evolution which culminates in the possible sharing of our precious intelligence with the universe.

The first epoch – "Physics and Chemistry" – comes right after the *Big Bang*, when matter started to coalesce into patterns, representing "discrete information"; the rules of our universe are "appropriate for the codification and evolution of information (resulting in increasing complexity)". The second epoch – "Biology and DNA" – started when life originated, and DNA made it possible to store information and keep a record of the evolutionary process. Decoding and understanding DNA is paramount to understand human evolution and to act upon future iterations of humanity. The third epoch – "Brains" – started when the first multicellular organisms developed brains and nervous systems that allowed them to process and store information detected by their sensory organs. The ability to recognize patterns started the long evolutionary process that culminated in our most precious *gift* – our brain –, which allows us "the ability to redesign the world in our own minds and to put these ideas into action". Scientist and science fiction writer Isaac Asimov declared that "... in man is a three-pound brain which, as far as we know, is the most complex and orderly arrangement of matter in the universe" (as cited in Morris, 2001). It still boggles the mind of scientists how our brain evolved into such a beautiful and complex computational natural system.

The fourth epoch – "Technology" – started with simple tools and evolved into complex automated machines "capable of sensing, storing, and evaluating elaborate patterns of information". Technology has allowed us to become the dominant species in the world for better and for worse. The fifth epoch – "The Merger of Human Technology with Human Intelligence" – is set to begin when the Singularity takes place (according to Kurzweil, this event will occur in 2045). The sixth epoch – "The Universe Wakes Up" – is thought to occur after the Technological Singularity; for Kurzweil, "the ultimate destiny of the Singularity", is for us to occupy the universe and spread our computational intelligence. The author believes that after we understand how to avoid the limitations of the speed of light, this new "superluminal ability" could allow us to achieve, at an accelerated rate, an increased propagation rate of intelligence throughout the universe – the last epoch in "the evolution of patterns of information" (2006, p. 14–21). By spreading our intelligence throughout the universe, we will also be spreading our moral principles, our stories, and our myths. Hopefully, when such an event takes place, our species will be better equipped to deal with other entities and with the human varieties that will emerge from our technological enhancements and space travel requirements.

The timeline Kurzweil presents is a bit *sci-fi-ish*, but that's inevitable when speculating about possible futures. Not everyone shares Kurzweil's techno-utopian optimistic view of the future, and that the Singularity is very near (circa 2045, according to Kurzweil's calculations); technology businessman Paul Allen and computer scientist Mark Greaves, for example, believe that although "this kind of singularity might one day occur, we don't think it is near. In fact, we think it will be a very long time coming" (2011). Others are more inclined to believe the Singularity will never arrive; philosopher Nick Bostrom, in his text *The Future of Human Evolution*, asked the following question: "Can we trust evolutionary development to take our species in broadly desirable directions?"; the author believes that the answer is *no* and criticizes excessively optimistic views of the future stating that our progressive evolution has been mostly

"due to luck" and that even if our evolution was, "to some extent inevitable, there is no guarantee that" it "will continue into the indefinite future" (2004, p. 1-2). He could be right on his conclusion. The *Planet of the Apes* (1968) film, adapted from a 1963 French novel, by author Pierre Boulle, explores such an idea: what if humans *devolved* instead of evolving and were replaced by a race of intelligent apes as Earth's dominant species. The fear of being replaced and subjugated by intelligent apes, aliens, machines, vampires, mutants, and zombies is abundantly explored in popular culture and stories that audiences and readers consume regularly.

Professor Sohail Inayatullah defines futures studies as "the systematic study of possible, probable and preferable futures including the worldviews and myths that underlie each future". This academic area "seeks to open up the future, moving from "the" future to alternative futures" (2013, p. 37–38), which means that Kurzweil's vision of the future is one possibility out of a plethora of conceivable futures. The idea is not to deny possible futures by imposing a monomythic plan or concept of the future but to be open to all possible futures and act upon them by developing desired and positive visions of futurity.

Inayatullah argues that in the last five decades "the study of the future has moved from predicting the future to mapping alternative futures to shaping desired futures", therefore, the way we perceive the world, and our desires shape the future (2013, p. 37). The best way to understand the future is through a "cogent theoretical framework" and Inayatullah presents four approaches: 1) "predictive"; 2) "interpretive"; 3) "critical"; 4) "participatory action learning/research". The first is "predictive, based on empirical social sciences", the second is about "understanding competing images of the future", the third is inquisitive and critical, and the fourth "focuses on stakeholders developing their own future, based on their assumptions of the future" (2013, p. 38). These theoretical approaches are valuable, but Sohail Inayatullah created a conceptual framework "for understanding the future", a foresight process he dubbed The Six Pillars: "mapping,

anticipation, timing, deepening, creating alternatives and transforming". The first pillar is about mapping the past, the present, and the future because knowing the past is the best way to know "where we are going", the second pillar is about predicting "new possibilities and opportunities", the third is about understanding "the shape of time" (e.g.: linear, cyclical, spiral) and searching changes in the pattern, the fourth is about layering the future according to specific dimensions to better understand paradigm problems and develop solutions. The fifth "is focused on methods to create alternative futures"; this last one is about transforming the future according to personal, collective, organizational, and national desires (2013, p. 45–58).

The future, in all its possibilities, is not static and people have the power to influence it for the betterment of humanity. For a deeper understanding of futures studies and The Six Pillars conceptual framework to create desired futures, we recommend the reading of the author's papers; these are not only interesting from the point of view of deepening the understanding about future possibilities, but also from the point of view of media studies, narrative arts, and speculative fiction. Shaping a balanced and positive future in a posthuman world by understanding where we come from and using empathic storytelling is possible; futures studies embrace all conceivable futures and the people actively shaping them.

Art and evolution

Defining *art* and its utility is a controversial and complex task (Adaijan, 2018) because there is no universally accepted definition of what art is and because the modern art's strategy relies on expanding "what counts as art" (Manovich, 2019, p. 2-3). Defining art is not something that will ever be achieved and that is a positive characteristic, nonetheless, its importance to our species and even other human species that predate us is undeniable. The goal of this chapter is not to develop an in-depth definition of art or evolution, but to compile enough information pertinent to the main goal of this paper.

Philosopher George Dickie said that the urge to define art is old but not an impossible undertaking. His *institutional theory* establishes that art is what is defined to be art by the artworld which is a group of systems and subsystems that accommodate the creative act; in essence: whatever the specialists consider being art is art. He recognized three historical phases that describe the search for a definition of art: 1) first attempts to define art (starting with the "imitation theory", followed by others such as the "expression theory"); 2) the negation that art could be defined; 3) his institutional theory – the final definition, free of ambiguities and the difficulties of traditional definitions (1984, p. 426-427, 429, 434). He concluded that even his definition "does not reveal everything that art can do" (1984, p. 437). Such an important component of the human experience will never be fully defined, but Dickie's attempt and his historical overview are more than adequate to this paper.

Artistic endeavors can create works of art by using different media; therefore, it evolves according to trends, tastes, notions of beauty, and technological advancement. We are always inventing new ways of telling stories and sharing our ideas.

> The history of art also involves the history of technological innovation. The evolution of the fine arts traditionally has been conditioned by the tools used to create works of art. In the Upper Paleolithic period, humans used rocks, sticks and natural pigments to draw and carve representations of animals and men. With scientific progress, creators were able to perfect their works of art using new tools, such as better brushes, chisels, casts, as well as improved techniques. This evolution eventually made possible the creation of new works of authorship, such as cinematographic works, databases, computer programs and, more recently, video games (Ramos et al., 2013, p. 7).

According to Professor Lev Manovich, the use of computers and intelligent software curated by humans to create works of art or emulate artistic artifacts have been around since the 1950s. For him, the problem is that these machines have been taught a more traditional approach to the artistic process that no longer conforms with what has been done in the artworld (2019, p. 2), and that "[w]e force computers to create like us" (2019, p. 7). He states that we should teach computers to do something totally different from what is a more human approach (2019, p. 8). This could come into fruition after the emergence of strong AI and when machines start teaching other machines; nevertheless, the human presence and human culture will always be a factor whether in convergence or divergence.

Artistic creation has a deep relation with technology, but it is also closely connected to human evolution and can be understood as an instinct. Philosopher Dennis Dutton talks about obsessive artistic instinct and the way arts are intertwined with our evolution and our need to create artistic experiences (2009, p. 1-3). For him, art is an evolutionary "adaptation" derived from "instinctive processes" and not a simple "by-product". Like language, the arts emerged spontaneously and "had clear survival value in prehistory"; Dutton believes that the "oldest of arts" might be creative storytelling (p. 4-5).

Beauty in arts is a very complex concept, impossible to be studied in-depth in this paper. One could say beauty is subjective and every person will judge a beautiful object according to its upbringing and education, personal and internal non-conscient tastes, and fashion. The human animal is a complex beast; ugly and sad things can be beautiful for the subjective taste of people, making the concept of beauty even more difficult to define. We are surrounded by beauty we have created with the tools and technologies we control and a cosmos of beautiful things that have been created by non-sentient forces that science is not able to explain sometimes; the twirling of a galaxy, the event horizon of a black hole, and a star's nurseries are beautiful and sublime.

Philosopher Immanuel Kant had a formalist view of beauty in the arts, and he understood it as subjective taste and not as a property of a given object; for him "beautiful is what we like in merely judging it" (1987, p. 56, 127, 174), and "in all beautiful art the essential thing is the form" (as cited in Johnson, 1979, p. 176). The form and its purposiveness, created by an inspired artist, can be judged to be beautiful. For Kant, the form is above all else, including the idea and the expression (as cited in Johnson, 1979, p. 174).

Defining something as beautiful, or geometrically balanced, and explaining why it is so can be a difficult task but when one sees beauty (man-made objects or in nature) one knows deep inside; it touches us somehow. This more romantic vision of beauty is contrary to what the artist and Professor Jeremy Gilbert-Rolfe thinks about beauty and the sublime in the contemporary world; he claims beauty is not important in the contemporary artworld, that it is easy to reproduce, and that it is a kind of frivolous and glamorous activity (1999, p. 41, 49); on the other hand, he believes that the sublime is less in nature and can be found now in technology (1999, p. 48, 52), which is an interesting notion to this paper. It makes sense finding the sublime in technology and human ingenuity when we have an orbital station that is the third most luminous object seen from Earth; the sublime reverse engineering of the human brain and the understanding of how a conscious mind works will be paramount for the emergence of sentient autonomous artificial intelligence that will allow human enhancements impossible to predict. Creating life from inert non-biological material is God-like activity and the stuff of mythical narratives.

Dennis Dutton understands the experience of beauty not as a cultural phenomenon but as "one component in a whole series of Darwinian adaptations. Beauty is an adaptive effect, which we extend and intensify in the creation and enjoyment of works of art and entertainment" (as cited in Popova, 2010). This scientific notion of beauty is more aligned with the purpose of this paper and an interesting perspective on the

matter. Beauty is part of our adaptation to the world and must not be discarded and mocked by intellectual, frivolous, and fashionable opinions or points of view.

The writer Alexandr Solzhenitsyn has decoded the famous Dostoyevsky's quote "beauty will save the world" as a prophecy where art and literature will eventually save humanity; Solzhenitsyn believes that "[f]alsehood can hold out against much in this world, but not against art" (2021). The idea that beauty and beautiful stories can save the world is the cornerstone of this paper. Jeremy Gilbert-Rolfe claims that the artworld has developed a kind of phobia about beauty and beautiful works of art: "[i]n the art world, the idea of the beautiful often threatens to make an appearance or comeback but, in practice, tends always to be deferred" (1999, p. 41). If beauty and stories will save the world (despite the seemingly artworld's disinterest in such a judgment of taste) it is important to understand the power of beauty in the contemporary world and what stories possess that redemption quality.

In a world filled with intolerance, discrimination, racism, xenophobia, and all sorts of ugliness – with the possibility of *Homo sapiens* fragmentation into other species and the emergence of strong AI –, art and beautiful creative storytelling are mighty weapons. It is not far-fetched to assume that creative storytelling could be the most important tool to help us make the transition into a posthuman world because it is a pertinent human built-in feature *designed* for survival. Humanity's success has been intertwined with technological advancements, creativity, and storytelling for a long time and will continue to be in the future.

Otherness, the monster archetype, and speculative fiction

According to geographer Jean-François Staszak, *otherness* is a kind of discourse by which a dominant group subjugates other groups of people by stigmatizing their *differences*. *Othering* is the creation of otherness, consisting of the active application of the dichotomy between *them* and *us* (2008, p. 2). Othering, often based on racial and social prejudice, normalizes artificial or non-existent category boundaries by recounting negative inflammatory stories, often lies and distortions. The wrong stories (the non-empathic ones that do not allow or promote understanding) might perpetuate the act of othering if not kept in check; other peoples and certain individuals become the embodiment of all fears, they become monsters.

Speculative fiction has been evolving since it was coined in 1948 by the American writer Robert Heinlein. The author created the expression to name a subset of science fiction that was more social and people-oriented, to the detriment of the gadget-oriented stories (Heinlein, 1991, p. 5). An example of social science fiction that examines what would happen to humanity if everyone (but one woman) got blind without an explanation is *Blindness* (1995), by Nobel prize recipient, the Portuguese writer António Saramago. The science in this science fiction story is neglected; no scientific explanation is given explaining why people lost their sight and after a while got it back in this Saramago's allegory, or *what if?* exercise (a very important question to the speculative genre of science fiction). Quentin Meillassoux might include this story in the genre he coined and defined as extro-science fiction because the catastrophe that blinds people is never explained scientifically and defies science and knowledge (2015, p. 5-6; 44). The only example he shares of a full-fledged extro-science fiction story, a fiction outside-science, or a fiction where science is no longer possible, is *Ravage* (1943), by René Barjavel, where, for no apparent reason or scientific explanation, "electricity stops existing" (p. 5, 16, 50). Another good example of social science fiction, which could be also considered extro-science fiction, is the three-season TV series *The Leftovers* (2014–2017); this amazing and well-written story explores what would happen to the world and people if 2% of the global human population suddenly disappeared. Along with the dramatic and traumatic narrative – the aftermath of a strange event – what happened

is never explained scientifically and more and more strange and implausible situations accumulate; the laws of physics and science seem to disappear, and human relationships are the focus of this science fantasy story. Science fantasy is a hybrid genre that mixes science fiction (science-oriented) and fantasy (magic-oriented).

The Speculative Literature Foundation, launched in 2004, defined speculative fiction as a "catch-all term" that includes folk and fairy tales, fantasy, horror, magical realism, modern myth-making, science fiction, slipstream, etc. (as cited in Shimkus, 2012, p. 25). Speculative fiction will be understood in this paper as a supergenre that includes the genres of fantasy, horror, science fiction, and all hybrid forms and subgenres of the three; this includes the more social-oriented sci-fi or extro-science fiction narratives.

According to scholar Patricia Manney, speculative fiction has used the concept of otherness for as long as people have been telling stories; for Manney, speculative fiction is an "empathy engine" because it transforms our perception of other peoples and instigates "the expansion of social inclusion and the liberalization of civilization"; speculative fiction also "allows us to tell the hard stories: hard to tell, hear, and accept" (2015; 2019, p. 243-244, 253). And there are many hard truths to be uncovered in our world.

Many speculative stories explore our fear of the unknown through the concept of the *monster* – the ultimate representation of the other. In the book *Rabid: A Cultural History of the World's Most Diabolical Virus*, the origin of monsters such as vampires, werewolves, and zombies are attributed to the infectious Rabies disease. The bite from these monsters is the catalyst for the descent into madness and animalization of the human being (Kreston, 2013). It could be argued that othering, in speculative fiction, is sometimes achieved by an action that allows some sort of mutation, possession, or zombification. The dehumanization of a person through a grotesque metamorphosis, or corruption of the body, is evident in vampire, werewolf, and zombie stories, where the *monstrification* of the human is achieved by a single contaminated bite.

Othering can be achieved in several ways and based on a multitude of reasons. Sociologist Erving Goffman, through his *theory of stigma*, distinguishes othering into three categories: "physical non-conformity or 'abominations of the body'; moral and behavioral weaknesses such as 'weak will' or 'dishonesty'; and socio-cultural markers of difference such as 'race, nation, and religion'" (Diamond & Poharec, 2017, p. 403). These three stigmata – physical, moral, and racial/cultural – are very important but they seem to be lacking.

Scholars Aidan Diamond and Lauranne Poharec developed their ideas for the identification of four socio-historical categories of othering upon the work of Professor Rosemarie Garland-Thompson: the supernatural, the outcast, the medicalized other, and the posthuman. The first category contains the freak (e.g., deformed people), the monster archetype (appearance or behavior), and the mad (e.g., prophets or possessed people). The second category contains the "undesirable" and "immoral" people who do not conform to certain societal rules. The medicalized other category comprises all the unhealthy people (e.g., obese, disfigured, injured, sick, and old people). The third category, the posthuman category, understands our ability and necessity to converge with our technologies and possible outcomes (e.g., cyborgs) (p. 403-407).

The theory of stigma and the four social-historical categories of othering can be combined to achieve a more cohesive and broad definition of otherness; six categories could be presented from a more scientific point of view to a more fantastical one: 1) technological; 2) physical; 3) racial; 4) cultural; 5) moral; 6) religious and supernatural. These categories are not only useful in the real world for a better understanding of the othering process, but also in the fictions that explore these themes and uncover some hard truths.

Philosopher Giorgio Agamben created the concept of *anthropological machine* to better understand the process of othering inside our species through the acts of animalization and dehumanization:

> In *The Open*, Giorgio Agamben diagnoses the history of both science and philosophy as part of what he calls the "anthropological machine" through which the human is created with and against the animal. On his analysis, early forms of this "machine" operated by humanizing animals such that some 'people' were considered animals in human form, for example barbarians and slaves. Modern versions of the machine operate by animalizing humans such that some 'people' were/are considered less than human, for example Jews during the Holocaust and more recently perhaps Iraqi detainees (Oliver, 2007, p. 2).

For scholar Kelly Oliver, it is odd that Agamben decided not to include the category of the *machine* in his binary anthropological machine concept, constituted only by the categories of *Man* and *animal* and the in-between exception he named *naked life*, a space of indistinction between Man and animal. Oliver believes that in the computer age "dominated by technologies that simulate intelligence and life" it is crucial to include the machine category and its relation to the other two (2007, p. 12).

Agamben's anthropological machine is a "device for producing the recognition of the human" (2004, p. 26) and how people interact with each other and practice othering, and its main goal is "that we might, eventually, be able to stop" it (20047, p. 37-38). Agamben's anthropological machine is important and has a formidable purpose, but to maintain its pertinence and be able to eventually achieve its goal in a posthuman ecosystem, it will be necessary to create a space of indistinction between Man and animal, Man and machine, and animal and machine; therefore, a more complex posthuman anthropological machine is necessary.

Life is considered by some scholars and scientists (e.g.: François Jacob, Norbert Weiner) as technological, and living beings are considered machines, or mechanical (Bradley, 2011, p. 1–3); Descartes might have popularized the idea, but it was Aristotle who first compared the human body to a mechanical device (Bradley, 2011, p. 7), therefore this a very old notion; it could be used as a pretext to include intelligent machines (software and robots), which are reverse engineered from human physiology and the human mind, into the Man category of Agamben's anthropological machine. But Agamben did not think of his device in those terms, and it is more than fair to create a category for artificial man-made intelligent beings that will eventually create better versions of themselves and evolve.

Monsters have been an important part of our myths and storytelling strategies since we developed language and started telling stories around the campfire. Popular culture would not be the same without monstrous antagonists and the monster archetype to *spice things up*. For that effect, many supernatural and technological monsters have been created, such as aliens, cyborgs, demons, ghosts, kaiju, mythical creatures, mummies, mutants, robots, spliced animals, vampires, werewolves, and zombies. The monster can be an animal or a plant with terrifying and menacing characteristics, or a deviant unnatural person with amoral and deformed characteristics (Merriam-Webster, n.d., Definition 1-4). Author Stephen King divided the monster figure into three archetypes: "the Vampire, the Werewolf, and the Thing Without a Name"; he also acknowledges the ghost archetype but, unfortunately, leaves it out due to its broadness (2012, p. 66).

In all genres, but more often in speculative fiction, the symbolic images and narrative abbreviations known as archetypes can be found. Archetypes (and stereotypes) are present in all stories, but speculative fiction has a propensity for myth and dream-like narratives which makes it fertile ground for such universal symbols. Author Christopher Vogler explained in his book, *The Writer's Journey: Mythic Structure for Writers*,

several archetypes that have been adapted from myths, legends, and fairy tales into cinema. These archetypes are recurring character types such as the questing hero, the herald, the wise old man/woman, the threshold guardians, the shapeshifter, the shadowy antagonist, the trickster, and the allies (2007, p. 23, 26). The threshold guardians, the shapeshifter, and the shadowy antagonist usually have monstrous characteristics or are themselves monsters.

The monster does not need the hero, but the hero needs the monster to justify his/her existence, and "[w]hen the hero confronts the monster, he has as yet neither power nor knowledge. The monster is his secret father, who will invest him with a power and knowledge … that only the monster can give him" (Calasso, 1993, p. 343). There are many types of heroes (willing, unwilling, loner, antihero, tragic hero, catalyst hero), and "[a]lthough usually portrayed as a positive figure, the Hero may also express dark or negative sides of the ego" (Vogler, 2007, p. 34). Sometimes the monster is the protagonist/hero, and the roles are inverted. In the Australian animated film *Grendel Grendel Grendel* (1981), an adaptation of the epic poem *Beowulf* (circa 10th century), we have access to the monster's side of the story. During this feature film, it becomes obvious that the *gentle* monster is a victim at the hands of the *monstrous* humans. Not only the monster is the protagonist, but he is also the most humane figure when compared to the barbaric humans.

According to Vervaeke et al., the most pervasive monstrous figure in the twenty-first century is arguably the zombie. This undead, mindless, homeless, hungry, and repulsive creature is the perfect metaphor for contemporary alienation, anxiety, consumerism, and disenfranchisement in Western nations. Zombies are the current monster *zeitgeist,* and they represent the lack of most of the qualities that make us human: culture, self-preservation, intimacy, and the capacity to speak. They are not intrinsically evil, but rather ambulate and spread their contagious decrepitude. The zombie is a paradox, "it is human and non-human, living and not living, cultural and non-cultural,

natural and supernatural". These characteristics raise two important questions: "if the zombie is both alive and not alive, what now does it mean to be 'alive'? And if it is both human and non-human, what then does it mean to be 'human'?" (2017, p. 13-24)

Several authors and franchises have been using zombies or zombified figures in their narratives. Writer George R. R. Martin, in his yet unfinished fantasy *opus magnum, A Song of Ice and Fire*, uses a sort of zombie marionettes, or reanimated corpses to which the fictional Westerosi call *whights*. The *white walkers*, also known as the *others*, zombify and manipulate anything dead (they also zombify animals) through their magical necromantic powers; they are the puppet masters. In science fiction, the hive-mind Borg civilization of the *Star Trek* franchise is a kind of zombified cyborg species that seems to represent our fear of technology in a very direct way; the *monstrification* of the human body (and other alien species) is achieved by the penetration and accumulation of hardware, transforming the mind and body of the conquered peoples. The hero Jean Luc Picard is captured and *borgifyed*, but he manages to escape the Borg's enslavement; this *monstrification* is reversible (he is the hero, after all) but post-traumatic stress disorder affects him deeply as can be seen in *Star Trek: First Contact* (1996). Picard is able to reacquire his humanity but at a great cost.

Picard's story arch is a technophobic narrative, but other stories show the monster in a better light. Stories are becoming more and more about the nuances of opposing sides and not just good versus evil. Old monsters, such as vampires, are now being shown as heroes or just people that have their problems, dreams, and anxieties. These new stories show that the monster is simply someone in search of acceptance or their place in a chaotic world.

For Patricia Manney, monsters are now so common that their "familiarity breeds humor", as it is seen in so many comical approaches to the subject matter, and they also breed

empathy where once they inspired fear and disgust (2019, p. 252-253). Writer H. P. Lovecraft said that the "oldest and strongest emotion of mankind is fear, and the oldest and strongest kind of fear is fear of the unknown" (1937, p. 12). The honest and most effective way of defeating the fear of the unknown is with good empathic storytelling and positive political leadership. Otherness and othering persist when lies and misinformation thrive and when people dehumanize others looking for their rightful place in the world. One thing is sure: the monster archetype is here to stay, and the worst monster is inside all of us, lurking.

Storytelling, storylistening, and myth

Patricia Manney believes that "storytelling is the key to empathy creation" and that empathy and technology are connected, becoming "inextricably linked when information technologies developed", and that some "of the most powerful ideas were distributed through printed stories as novels, the first great mass entertainment medium" (2008, p. 1-2). Manney understands that the art of storytelling, whatever the medium, is the most powerful tool to understand others empathically, to know their point of view, and connect with them by making use of a particular "evolutionary adaptation": mirror neurons that allow us to understand other individuals by *seeing* through their eyes (2008, p. 2, 8-9); but she is also aware that, nowadays, "personal media" is destroying empathy and that people are living inside virtual ghettos where they do not deal with others, but with more people like them, with the same points of view (2008, p. 5). She is afraid that our future technological evolution divides our species into enhanced and unenhanced/natural peoples lacking empathy for one another (2008, p. 8-9). For Patricia Manney, there is only one way to avoid estrangement between humans and transhumans and that is through storytelling:

> (…) the only hope is for all of us to tell stories. Lots and lots of stories. Both our own stories and the stories of others. Both true and fictional stories.

But most importantly, like the best storytellers, we must make these stories universal in their appeal. And make them from our heart. Then we must spread these stories as pervasively as possible in the multicultural sphere, using as many forms of media as possible (…) (2008, p. 9).

Manney concluded that the best tool we have at our disposal to attenuate the problems of a posthuman world and to dissipate otherness and othering is through storytelling, be it through oral tradition or the many media we have at our disposal. As Dennis Dutton, Patricia Manney also believes that storytelling is part of our evolutionary success:

> In evolutionary biology, stories matter because from moment to moment, our brains confront the randomness of reality. Brains don't like randomness, because it's harder to survive if we think everything in our experience is unrelated. Pattern recognition is intelligence. And communicating those patterns are the first stories" (2019, p. 245).

Storytelling arises from an instinct to survive and evolved as our brains became bigger and more complex, but the wrong stories can be pernicious and instigate the act of othering: storytelling "can be used to kill empathy. That's anti-empathy. We see this in sexist/racist/religious propaganda, nationalist fear mongering, and even in how groups like the military use video games" (Manney, 2019, p. 246). Storytelling per se will not save humanity if the wrong nefarious stories are being told, propagated, and repeated *ad nauseam*.

Scholar Brian Boyd questions how it is possible, from an evolutionary point of view, for a successful species such as ours to engage so much in fictional stories that people know to be figments of the imagination and not real; he understands that language, narrative, play, and hypersociality are important pieces of the puzzle (2018, p. 1-2). For Boyd, and according to "fossil and genetic evidence", the spoken language emerged

with *Homo heidelbergensis* ("the common ancestor of *Homo sapiens* and *Homo neanderthalensis*") (2018, p. 4). Fiction was the result of language, narrative, complex imaginative mind, and play; for Boyd, fiction "is narrative as play" (2018, p. 9-10). The author argues that fiction "appears able to induce changes of social attitude more readily than nonfictional narrative" and that by "depicting suffering from the perspective of the sufferer" stories expand "the circle of compassion" (2018, p. 11); this fact shows us the importance of empathic storytelling in changing social attitudes towards non-human beings and other sentient species. Brian Boyd also understands language and storytelling as evolutionary adaptations:

> Narrative arose from an adaptive predisposition for sociality, social monitoring, and information-sharing in our hominin forebears that found much richer expression after the invention of language. Language too arose from an adaptive predisposition for intense intraspecific communication, but was an invention that then impacted in complex ways on human development, individual and social behavior, cognition and emotion (including our craving for language), and presumably our genes, by means of the genetic assimilation... (2018, p. 12).

For Boyd, the fact that we have evolved in language, narrative, and religious niches resulted in us having "language-craving minds", "story-craving minds", and "religion-craving minds". The latest niche – Science – "has not yet become an adaptive predisposition, although this latest niche we have constructed has begun to have the strongest effects of all":

> We live now in a scientific niche that has transformed our lives and our world, but our minds can be made to accommodate science only through explicit teaching that most still find difficult. We are not yet a species of science-craving minds (2008, p. 12-13).

This fact – the lack of widespread science-craving minds in the world – is a very important obstacle to a proper transition into a posthuman ecosystem which can only be combated with the propagation of scientific knowledge and achievements through proper storytelling. The persistent denial of the several moon landings and that the Earth is spherical shows us the power of lies and the lack of widespread science-craving minds.

Scholar Zoltán Simon's historical perspective of the relationship between humans and posthumans, specifically transhumans, is one of disconnection. He understands the new era of posthumanity as a historical cut under the guise of being a "technological Enlightenment" where non-human better-than-human subjects dominate the world and replace humanity as the central theme of history (2018, p. 11-12). For him, a posthumanity that wishes to replace humanity means that "posthumanity is not humanity's future" and "humanity is not posthumanity's past" (2018, p. 13-14). The author believes that posthumanity should not be repeating the story of humanity with a different goal and that the best approach to the study of humanity and posthumanity relationship is not by excluding one part of the equation; he also understands that this is a far more demanding albeit stimulating approach and one that must be studied in the future (2018, p. 16-17).

Simon's request for a deeper study and understanding of the relationship between humanity and posthumanity is of the utmost importance. Having said that, science has a broader sense of what being human means and that the evolution of Man is a very convoluted story: the genus *homo* encompasses several human species with different levels of intelligence and abilities, and the *Homo sapiens* of today (the only living human species on the planet) intermingled with other species such as Denisovans and *Homo Neanderthalensis*. All these species are part of the human story as well as all future iterations of humanity, whatever they look like, think, love, and tell stories.

Professor Brian W. Sturm has stated that when people listen to a story, they experience a "storylistening trance" – an "altered state of consciousness" –, and, while the storyteller verbalizes the story the listener creates the true story in his mind, overlaying it with personal experiences and memories; "people who listen to stories can undergo a profound change in their experience of reality" (1999, p. 2). Before the advent of the written word and the first great mass entertainment medium – books –, people used their rhetorical skills to entertain others and communicate great and small ideas. The storylistening trance enabled people to *see* what they had never seen before and empathize with other people and tragic heroes and their often-fantastical quests.

Philosopher Claude Lévi-Strauss understood myth as a particular type of language, speech, linguistic phenomena, or system of communication (1955, p. 430). Myth is usually considered a traditional story that presents the worldview of a people, a set of beliefs, or natural phenomena; myths can be parables, allegories, or stories about something or someone; the word myth, unfortunately, has also come to signify something false (Merriam-Webster, n.d., Definition 1-4). To Lévi-Strauss "the kind of logic which is used by mythical thought is as rigorous as that of modern science"; the "difference relies not in the quality of the intellectual process, but in the nature of the things to which it is applied". He uses an example from the field of technological achievements to better explain his point of view: a stone ax is equally well made as a steel ax; the difference is in the material and not in the design. He then concludes: "man has always been thinking equally well; the improvement lies, not in an alleged progress of man's conscience, but in the discovery of new things to which it may apply its unchangeable abilities" (1955, p. 444).

Professor Tom Lombardo, in his article *Science Fiction: The Evolutionary Mythology of the Future*, defends that science fiction can be traced back to ancient myth due to its inherited characteristics, and that "it brings the future alive within our minds", "making it "the most visible and influential form of futurist thinking in contemporary popular culture" (p. 5–6). Contemporary myths in Western societies are mostly found in the field of entertainment; these *new* franchised myths populated by superheroes and other fantastic characters are often cinematographic and televisual (streaming and legacy TV).

One could argue that the announced decline of myth and mythical thought is reversing because of the massive production of speculative fiction movies (Silva, 2020, p. 14). Never have we seen so many films and TV series about artificial intelligence, androids, cyborgs, robots, and how technology is changing our lives. These new myths could have the positive effect of preparing people for big changes and how to cohabit with other sentient beings.

Artificial intelligence, androids, cyborgs, and robots

The presence of intelligent apps and software in our daily lives is becoming ever more prevalent. In feature films such as *Ex Machina* (2014) and *Her* (2013), we have a glimpse of what the near future could bring us in terms of artificial thinking entities. In *Ex Machina* the creator of Ava goes through several iterations of the artificial brain to achieve the goal of a self-aware thinking machine; In *Her*, the intelligent app Samantha goes through several stages of cumulative knowledge until she decides her human friend Theodore is no longer someone who she wants to spend time with. The stages these intelligent operating systems go through define the degree of intelligence they have; therefore, it is important to distinguish between different types of artificial intelligence.

Futurist Tannya D. Jajal defines three categories: 1) Narrow AI; 2) General AI; 3) Super AI. The "Artificial Narrow Intelligence (ANI) also known as 'Weak' AI is the AI that exists in our world today". In the above-mentioned films, the AI could be designated as Artificial General Intelligence (AGI), or Strong AI. After the emergence of these sentient, emotional, and self-aware machines, we will supposedly see the emergence of

Artificial Super Intelligence (ASI), which "will surpass human intelligence in all aspects — from creativity, to general wisdom, to problem-solving" (2018).

Robots are, sometimes, erroneously used as synonymous with artificial intelligence and androids and robots have had different meanings at different times throughout history. The physician and librarian Gabriel Naudé coined *androids*, which can be translated as *manlike*. It was used to describe mechanical toys, or automatons, with human-like features (Riskin, 2016). Patricia Manney, on the other hand, claims that the word android was coined by Saint Albertus Magnus (2019, p. 249). Nonetheless, the word evolved and, nowadays, it is more correlated with the concept of artificial organic human beings: a good example is the genetically engineered *replicants* in the *Blade Runner* cinematic duology.

The term robot had a similar *evolution*. It started by being applied to artificially created organic people, much closer to the modern concept of android; the term evolved and now a robot is a simple machine used for repetitious actions or, as it is portrayed in science fiction, a mechanical non-biological being that can be operated from afar (telepresence) or from within (artificial intelligence or a human operator).

> The word "robot" made its first appearance in a 1920 play by the Czech writer Karel Čapek entitled R.U.R., for Rossum's Universal Robots. Deriving his neologism from the Czech word "robota", meaning "drudgery" or "servitude", Čapek used "robot" to refer to a race of artificial humans who replace human workers in a futurist dystopia. (In fact, the artificial humans in the play are more like clones than what we would consider robots, grown in vats rather than built from parts (Riskin, 2016).

For professor Antonio Caronia, a cybernetic organism, or a cyborg, is somewhere in between a robot and a biological being; in this hybrid form, "the creator and his creature" are fused, unlike the designed and built robots and androids (2015, p. 36). The author also indicates that the scientists Manfred Clynes and Nathan Kline coined the *cyborg* neologism in 1960, in their paper *Cyborgs and Space*, although the concept (but not the term) rose in the 1920s, with fictional works such as *The Clockwork Man* (1923) (p. 37). Clynes and Kline's paper proposed that "[i]nstead of trying to provide artificial, earth-like environments for the human exploration of space, why not alter the humans so as to better cope with the new and alien demands?" In other words, they proposed reengineering and augmenting the human body "to fit the stars" by creating man-machine hybrids (as cited in Clark, 2003, p. 13-14).

Author Andy Clark has a different concept of the cultural icon that is the cyborg hybrid form. For Clark, the merging of flesh and electronic circuitry is not necessary, and he stated that the prevalent near-future technologies would "be those that offer integration and transformation without implants or surgery: human-machine mergers that simply bypass, rather than penetrate" the human body (2003, p. 5, 24). Clark believes we are all "natural born cyborgs" because of our ability to integrate external tools and devices that alter and transform the way our mind works; he considers that our "mind is less and less in the head" ever since we started using mind-expanding technologies such as talking and, much later, writing (p. 4-7).

> It is our natural proclivity for tool-based extension, and profound and repeated self-transformation, that explains how we humans can be so *very special* while at the same time being not so different, biologically speaking, from the other animals with whom we share both the planet and most of our genes. What makes us distinctively human is our capacity to continually restructure and rebuild our own mental circuitry, courtesy of an empowering web of culture, education, technology, and artifacts. (Clark, 2003, p. 10)

Androids, cyborgs, and robots are now a part of our imagination and are frequently featured in popular culture, as well

as the *disembodied* artificial intelligence. Moreover, what once was considered fiction and imaginative speculation is now a part of our daily lives and discourse and are not just plot devices in films, TV series, videogames, board games, and comic books.

The fact that posthuman entities are being explored in so many media, illustrates our interest in understanding how they will change our lives in the future. Familiarity with such concepts is the best way for people to get accustomed to their possible existence and understand how to relate with them empathically. The world is changing too fast, but speculative fiction can help make sense of the rapid changes of the Anthropocene epoch and the challenges of posthumanism.

Conclusion

Our predisposition to assimilate new technologies that transform our bodies and minds comes from before the emergence of *Homo sapiens*. We will continue to evolve in unpredictable ways, and only possible to anticipate and understand in the realms of futures studies and speculative fiction. It is possible our forthcoming evolution could allow the emergence of new human species and hybrid Man-machine beings which will further disrupt the world's precarious social fabric. Predicting and mapping alternative futures to better understand and foresee what we will be facing is paramount to shaping desired inclusive futures. A posthuman ecosystem consisting of biological and digital humans, reverse-engineered mindware and AI, androids and cyborgs will surely aggravate an already unbalanced world with such a tendency for the dehumanization and animalization of other peoples. The stories being told, and specifically the speculative fiction narratives that have been produced in bigger quantities these last few decades (especially in cinema and TV), can be studied as a sort of buffer zone allowing people to deal with the emergence of other sentient species in the near future.

The recurrence of speculative futuristic themes and concepts such as artificial intelligence, androids, cyborgs, and robots in our stories help us normalize these ideas and understand how to adequately interact with them; stories work as a kind of safe place where people can experience the other and understand their specific points of view, therefore, storytelling and the empathic motor of speculative fiction might allow a progressive and positive transition into a posthuman ecosystem if humanity is able to avoid its worst instincts.

We are natural-born storytelling cyborgs defined by the evolutionary adaptations and technologies that changed our bodies and minds; consequently, we should embrace our evolutionary path, understand our history (the good, the bad, and the ugly) and prepare for our challenging future. Storytelling is not only important to a less disruptive transition towards a posthuman ecosystem but also an important tool for future interspecies relationships. If the Kurzweilian Six Epochs storyline comes into fruition and humankind spreads its intelligence throughout the universe, such interstellar diaspora will eventually result in the emergence of different human species adequately evolved to live in alien environments. Future storytelling could allow the sharing of experiences and myths between different species improving interactions and knowledge sharing. Storytelling is paramount for a smoother transition into a posthuman ecosystem, but it is also an important tool for future interactions between different species of people.

Our language-story-religious-craving minds and adaptative predisposition to tell stories are important elements for the necessary social changes toward a more inclusive world, but it is our science-craving minds that will allow for empathic interspecies relationships to evolve and mature in the future. The current hegemony of technology and its impact on our species is too prevalent and can only be sustained by humankind embracing it and craving for it.

Being one of the most ancient forms of art and part of our evolution and survival strategies, storytelling is the perfect weapon to achieve convergence and understanding between peoples; but storytelling has also a disruptive quality to it, meaning that we must create great quantities of empathic and beautiful stories to minimize the importance of the non-empathic destructive narratives that divide and antagonize.

Dostoyevsky said that "beauty will save the world". Hopefully, he was right.

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