ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DIPARTIMENTO DI ARCHITETTURA
DIPARTIMENTO DI ECCELLENZA MIUR
(L. 232 DEL 1/12/2016)

In copertina: Image generated by the sentence "head with VR headset, wallpaper"
with Midjourney AI by Michele Zannoni.

Progetto grafico: Gianluca Bollina-DoppioClickArt (Bologna)
Impaginazione: Design People (Bologna)

Stampa: Global Print (Gorgonzola, Milano)

Prima edizione: novembre 2022

Human Body Interaction

edited by Michele Zannoni, Roberto Montanari

Summary

HUMAN BODIES, SYSTEM AND MACHINE INTERACTION

HUMAN BODIES, DIGITAL DATA AND SOCIAL IMPACTS

DESIGN OF THE HUMAN BODY: FROM FICTION TO REALITY

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> With us begins the reign of people separated from their roots. That of the decayed man who mixes with iron and feeds on electricity.
>
> Filippo Tommaso Marinetti, *Rinneghiamo i nostri maestri ultimi amanti della luna*, 1917

The wish to improve through technical innovations, but at the same time the fear to lose humanity, goes back to the arts at the beginnings of industrialization. Mary Shelley's novel *Frankenstein or The Modern Prometheus* testifies to this. It appeared as early as 1818 – as a settlement with scientific hubris in the guise of horror romance. During the Renaissance, after a 1000 years of medieval reclusion by the Church, life sciences began to slowly gain terrain, but it took other hundreds of years and brave surgeons to understand more about the human body. A body that was slowly understood as a machine, as the old school of Hippocrates – which analyzed the body only through external symptoms and excretion – was abandoned (SICKLINGER, 2020, pp. 32-36). A genius like Leonardo was needed to explore the human body as an interconnected system. His anatomical studies fascinate the observer still today, in part because of their accuracy – when looking at hyper-realistic representations of upper-limb or hand anatomy. But the more impressive sketches are the ones where Leonardo transforms the human joints into mechanical pieces, draws the heart as a 2-chamber oven, or compares a neck with a ship mast to move the head:

You will make the first draft of the neck with the use of ropes like the tree of a ship near to the coast... Then fix the head with the ropes in order to give movement. (SICKLINGER, 2020, p. 40)

Comparison between mechanics and human movement is new and could be interpreted as an ancestor of biomechanics. The human body remains first of all a source of power for work, first in

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agriculture, then in industrial production. The fascination with technology, steam, mechanics, and movement also accelerated the unhealthy interaction of the human body with increasing discomfort, diseases, and losses. Reluctantly, but eventually and necessarily, the human body became an object of research and analysis beyond the pure medical aim of curing, but on a level of possible performance. Many diseases brought by Industrialization and its harmful working conditions caught the attention of brilliant surgeons like Charles Turner Thackrah (1795-1833) regarding the condition of workers, with an improvement in health conditions for a higher benefit of the factory owners (Sicklinger, 2020, pp. 54-57). The fascination with machines, their capacity to overcome human limits of power, precision, and speed, was the basic trend of late nineteenth-century society, together with new communication technologies like the telegraph, colonization, politics dominated by world trade, and coffee house debates.

After 1900, Italian Futurism took this love for engineering achievements to the next level:

Have you ever watched an engine driver lovingly washing the great powerful body of his engine? He uses the same little acts of tenderness and close familiarity as the lover when caressing his beloved. We know for certain that during the great French rail strike, the organizers of that subversion did not manage to persuade even one single engine driver to sabotage his locomotive. And to me that seems absolutely natural. How on earth could one of these men have injured or destroyed his great, faithful, devoted friend, whose heart was ever giving and courageous, his beautiful engine of steel that had so often glistened sensuously beneath the lubricating caress of his hand? (Marinetti, 1915, pp. 95-96)

questions Filippo Tommaso Marinetti, a self-proclaimed pioneer of the Italian futurists, in 1915 in his book with the incredibly anticipatory title *Extended Man and the Kingdom of the Machine*. His call for self-abolition in favor of the machine was premature, but it produced rousing works of art: the dynamism of new beginnings and the intoxication of speed have probably never been celebrated more euphorically than in the pictures and sculptures with swirling lines of force by Giacomo Balla or Umberto Boccioni.

Ekaterina Lazareva in *The Futurist Concept of Man Extended by Machines* (Lazareva, 2018, p. 215) believes that the erotic meta-

phors in cited text underline a key Futurist concept: the *extended man* (in Italian: "l'uomo moltiplicato"), who is at the same time human, anti-human, and superhuman. In Marinetti, this concept refers to the strong self-identification of the man with his car, which he eventually proclaimed an "incalculable number of human transformations" (MARINETTI, 1915, p. 86) and dreamed of inhuman and mechanical types of human beings who would surpass themselves by means of technical devices. The latter would adapt to the technological environment by growing new body parts: "Even now we can predict a development of the external protrusion of the sternum, resembling a prow, which will have great significance, given that man, in the future, will become an increasingly better aviator." (MARINETTI, 1915, p. 86) One could again go back to Leonardo da Vinci and his experiments on a flying machine, where wings are added to arms as extensions and imitations of a bird's anatomy. Underlying experiments and calculations of the arm forces to explain the available force for moving those wings confirm the idea of *mechanizing* the upper limbs.

This love of technology is compared with the daily life struggle with often deadly uncontrolled machines and vehicles simply because of the lack of acquaintance with the new speed and power. Man is threatened by smoking vehicles or electric trams, especially in the fast-growing cities with the continuously enlarging, unconscious population from the land. On one hand, these urban contexts brought a variety of environmental issues such as pollution of water, air, and soil, but also a variety of forward-looking innovations. Municipal water, gas, and electricity companies provided artificial light and flowing water not only in public life but soon also in the private sector, while electric trams allowed to connect more affordable suburban areas to the town center. The technological metropolitan culture became the basis for diverse optimistic visions of progress, but also for experiences of loss of natural life contexts and novel clinical pictures. The nerves of many people seemed to be no longer able to cope with the increasing speed, the noise, and the hectic pace of industrialized society; the neurasthenia disease spread and became the hallmark of an *age of nervousness*.[1] Already in 1869, the New York doctor George M. Beard published an article on psychosomatic disorders in a medical journal and found wide appeal, also in Europe. Those who experienced the last decades of the 19th century were

evidently already the victims of new neural deceases as frequent publications on the topic confirm. Nervous weakness as a disorder of the entire nervous system became increasingly common in a such century, according to the large Meyer-Verlag encyclopedia of 1896. Not to be considered an actual disease, but can be seen as a result of the fact that the nerves in the broadest sense are overwhelmed by the growing demands for mental and physical performance. The historian Joachim Radkau believes that the frequent occurrence of nervous disorders appeared mainly around 1880: until then, working life was still largely determined by the natural rhythm but also – for multiple reasons from politics (wars around Europe to establish new political orders and powers) to technology (steam, industrialization, extensive colonization, trading) – got into stormy motion. Time and speed were given a completely different status, complaints increased about the constant need to catch up and not getting the job done. All these factors extended their influence to other life sections. The advancing process of industrialization, the change in eating habits, and the expansion of the sedentary lifestyle resulted in disturbances that quickly became a mass phenomenon.

In 1923, Le Corbusier proclaims *Une maison est une machine à habiter* [a house is a machine in which to live], thus extending the new idea of public life to the personal living space, visually made famous through the epic film *Metropolis* by Fritz Lang in 1927. The Unité d'Habitation in Marseilles is the emblematic example of concentrating living spaces in a reduced volume, with the intent to enlarge the remaining green area, but at the same time neglecting the need for the individuality of human nature. As part of a machine, the single human units should fit into a greater order of engineered living.

What was originally understood as the integration of the machine with the human being for the purposes of innovation and reduced personal fatigue – since the machine can surpass human abilities (especially strength) by a thousand times – soon became detached from the economic interests of factory owners. The human body constantly interacting with the machine became a *mechanical system* in itself, regarded as the place of *smart* mechanical-biological elements. With strong criticism under the veil of satire, Charlie Chaplin accused this late industrialism – where nervous diseases had already been clearly recognized and relat-

ed to repetitive body movements and inconvenient postures – at the beginning of his film *Modern Times* in 1935. In the famous scenes, in which the actor is under the stress of repetitive movements, the reactions of this suffering mind are various: the restless fixing of bolts at any given speed makes him chase missing items into the mechanical systems of the production, up to the final stage of delirium when he sees a bolt to fix in any kind of bottom. The result is, as shown correctly in the film, a nervous breakdown, and recovery in a specialized hospital.

With the advancement of medicine, what Mary Shelley portrayed as a horror vision became more and more a reality: transplants, repairs, improvements to human organs, and the skills associated with them. But also the mere performance of exceptional actors started to increasingly attract the dreams of thousands: the giant that can't be defeated if not by unusual smartness (as in the case of David and Goliath) started to become the goal of human power. The idea of exceptional soldiers and workers fires the imagination of ideologies, especially those based on Anticapitalism: the example of Alekseĭ Grigor'evič Stakhanov. On August 31, 1935, he mined 102 tons of coal in one shift of 6 hours in a hard coal mine. That was 14 times the labor standard at the time, which was 7 tons on average. He had previously exceeded this value, but that day was particular. He was hailed as the ideal of a worker. After his record, he became head of the Socialist Competition Department in the Ministry of Coal Industry, but he could not deal with his success: a worsening alcohol problem and ensuing incidents eventually led to an ultimatum to leave Moscow within 24 hours. The social dimension of the phenomenon becomes immediately visible. But in the end, the term Stakhanovism today represents not the socialists' Party desired success for work improvement, but an insane attitude of work exaggeration, often leading to workaholism (STACANOVISMO, S.D.) Yet, dealing with an almost superhuman ability gains particular importance on a social responsibility level,[2] which cinema wants us to believe in the idealized forms of the superheroes like Superman, Spiderman, etc.: the dream of superpowers that characterize the heroes of the new era are more important than the more medieval idea of miracle maker or wizards with supernatural, unexplainable powers. Superheroes, in contrast to wizards, are characters that possess superpowers, abilities beyond those of ordinary people,

and fit the role of the hero, typically using their powers to help the world become a better place, or dedicating themselves to protecting the public and fighting crime. These advanced body features made generations of readers and cinema spectators dream of replicating the same body abilities and being admired for their actions. It went so far that in one of the most successful cinema sequels, Arnold Schwarzenegger in Terminator II turns into a good personality, after having been introduced in Terminator I as the undestroyable humanoid robot from the future that wants to determine human destiny. In this way, the personality won the sympathy of the globe.

The spirit of the time of *Human (as) Engines*, highly performing, powerful, and perhaps indestructible, was nurtured by philosophical ideas like the *Übermensch*, which has been translated as *Beyond-Man*, *Superman*, *Overman*, *Uberman*, or *Superhuman*. Different from the idea of Marinetti's *Extended Man*, who is to be modified as a machine or part of it, this (philosophical) superhuman is an *ideal person* who has outgrown the ordinary life of a person who is considered normal and mostly negative. But the scientific progress went much further than the hypothesis of the most famous *Übermensch* by Friedrich Nietzsche, who is able to perform better through *above-average health*. According to Nietzsche, the future person will first and foremost need one thing: *great health* – something which one not only has, but also constantly acquires and has to acquire, because one has to give it up again and again (VIRILIO, 1996, p. 118). In Nietzsche's *Thus spoke Zarathustra*, the consequence of these statements is well known:

this brings healthier people, dangerously healthy people, or rather *Übermenschen*, whose reward is to have an as yet unknown country in front of you, the borders of which no one has yet ignored, a beyond all previous countries… (VIRILIO, 1996, p. 119)

The idea of "sit mens sana in corpore sano" is not new, and body training to improve health is as ancient as Greek and Egyptian stone lifting practices. The ideal body was toned and trained, either as esthetical value or as an image of war performance. Yet the citation of Nietzsche sounds like the end sequence of the 1982 film *Blade Runner*, when the Android declares "I have seen things you people wouldn't believe", pointing out the impossibil-

ity of human bodies (and minds) to face certain environments that need stronger bodies: it becomes his claim for the right to live. Paul Virilio calls this the *Planet Man*, a scientifically and universally adapted body prepared for interstellar travels. He analyses in his book *Die Eroberung des Körpers* that the new frontiers of science and discovery are no longer to be sought in the large dimension of the universe but in the extremely small dimension of nanotechnology and, connected with this, the effects and interventions on and especially in the human body (VIRILIO, 1996, p. 120). This is the new frontier of modern science. Instead of the bite of a spider or the breath of an Egyptian Cat that generates a superhero,[3] we ought to think that what is closer to a real future vision of *Übermenschen* is the fictional character Molly Millions from Gibson's influencing *Negromante* from 1984.

Molly is a physically tough bodyguard/mercenary cyborg. Her augmentations are referred to the lenses […] sealing her eyes in their sockets; at first glance, they resemble mirror glasses. The lenses are probably vision-enhancing; but do not seem to cut down the sunlight. Microchannel image-amplifications allow her to see in the dark by converting photons into a pulse of electrons. The switch is one of her lower front teeth. While her nails are artificial. Beneath them there are 10 narrow, pale blue steel scalpels 4 cm in length. They are double-edged razor-sharp blades that stick straight out from her fingers. And finally, a clock readout with blue characters is chipped into her optic nerve, low in her left peripheral field. Her sensory input, metabolism and neuromotor reflexes are also artificially [augmented] by means of electronic implants and exotic forms of advanced surgeries and other medical procedures. Even while wearing a plaster cast her movements are calculated, like a dance. (MOLLY MILLIONS, S.D.)

Medical surgeons saw the human body as a designer's object, rather than a place to adjust defects or missing parts, for years, starting first with the aim of maintaining the eternal beauty of the aging skin and body, and later to enhance performance to a higher level.

The teaser of Deus Ex related to the augmented biomechanical technology company, Sarif Industries, alludes efficiently to a new future that handles human bodies like the one of Molly Million. It becomes a matter of personalization of body performance. At this point, the Cyborg is conceived.

The cyborg is a hybrid creature, defined as a state that transcends the limitations of human existence with the help of cut-

ting-edge technologies of different kinds, mechanical or biological, including genetic manipulation, nanotechnology, and robotics. The term *cyborg* was first coined in the 1960s by researchers attempting to adapt the human body for space exploration, who defined it as the entity that "deliberately incorporates exogenous components extending the self-regulatory control function of the organism in order to adapt it to new environments" (CLYNES & KLINE, 1960, p. 27). This depiction rewrites the connection between humans and technology that has shaped the collective imagination up to that time. From the ab-human Gothic automation (HURLEY, 2004) to a post-human condition. Donna Haraway (1991) stated that the cyborg is a cultural metaphor for a hybrid figure (human, animal, machine), able to destabilize the dichotomic forms of the western world, challenging humanist, anthropocentric assumptions. Haraway explored the potential of technology to address socio-political issues such as inequality in class, gender, and ethnicity through the cyborg as a *confusion of boundaries*. Being outside of classification systems and hierarchies, cyborgs represent a way to reject the systems that served as means to dominate certain classes of people. In *The Surrogates*, a limited-edition comic book series by Robert Venditti, humans have the possibility to live their daily lives through other bodies: there is one who chooses a surrogate body to be able to walk; one who wants to be the woman he is in the inside; and one who chooses a surrogate body to access a male-dominated job. These people are all limited by their physical bodies in different ways, and so the surrogate bodies are necessary for them to fully enjoy life. The scenario depicted in the comic book lets us understand that by limiting bodily variation, erasing race and cultural difference in favor of one race and culture, we risk falling into what Hayles refers to as a nightmare, a "culture inhabited by posthumans who regard their bodies as fashion accessories rather than the ground of being" (1999, p. 5). Hayles warns us of the importance of recognizing and celebrating "finitude as a condition of human being, and that understands human life is embedded in a material world of great complexity" (1999, p. 5). Haraway's optimistic view is shared by many, especially the ones interested in the cyborg as a condition of cognitive and physical enhancement. Bostrom and Sandberg (2009), for example, say that humans, with the help of progressive technology, could attain higher levels of moral excel-

lence and become transhuman. This approach is putting at the center the hard modifications through technology, trusting that this will allow us to transcend the limitations and evils of humanity. This approach seems not interested in the social implications related to patriarchal problems, classism, poverty, and racism. It is indeed more utilitarian and grounded in humanist ideologies bringing indeed other issues to the table. On one hand, we have technological devices, think about biomedical devices, that like all computers can be hacked and reprogrammed, opening issues on the violability of the body. On the other hand, we have the problem of the accessibility of these technologies. The risk of limiting the use to a certain elite of individuals and preventing other groups from participating in the potential transformations that cyborg technology could permit has to do with power distribution issues.

The promises of the cyborg culture are something other than what it delivers. Gene therapy, drug therapy, mechanical human-like replacement limbs, and neural implants are mostly in the experimental stage (*ibid.*, p. 312). We are used to a more mundane reality, that contemplates the use of technologies to treat people suffering from physical illness and possibly restore the conditions to that of a healthy person. More advanced cyborg technologies exist only in speculative fiction, for now. The reconceptualization of the human body in a 'techno-body', using this idea of merging the biological/natural and the technological/cultural, has infiltrated the imagination of Western culture (Balsamo, 1996). Different forms of the cybernetic organism have been persistent in popular culture products such as books, TV shows, movies, videogames, toys, and comic books. This dimension is rapidly overlapping with reality, creating a blurred, if not confused territory. This is clear if we think about the ban from the 2008 Olympic games given to Oscar Pistorius. According to the IAAF, the international governing body of track and field, the J-shaped blade gave Pistorius an unfair advantage over able-bodied athletes by allowing him to use less energy as he ran. Dr. Hugh Herr, a professor of biomechatronic at MIT, referred directly to the negative influence of the collective imagination: "One thing we're fighting against is pop culture and Hollywood... People believe things exist that don't." (Springer, 2008, p. 26) This does not mean that we are not going in that

direction. Herr himself indicated that "we are beginning the age in which machines attached to our bodies will make us stronger and faster and more efficient" (HERR, 2014), referring to a project of an active autonomous ankle exoskeleton that reduces the metabolic cost of walking. Fiction has the power to direct the desires of these transformations. On the other hand, if we add the accessibility to manufacturing technologies and electronics, we can certainly see positive results considering, for example, the current possibilities of 3D printing to make prosthetic limbs (THE GUARDIAN, 2018, 3:52). When you have the possibility to explore multiple ways to reconstruct your abilities and physical condition, you can recognize the possibility to express new human configurations. Jason Barnes worked to customize his prosthetic forearm to let him play the drums, or to do what he was able to do before his injury. Where there was once a stigma, amputees are now empowered and enhanced. Using a robotic arm designed to collaborate in the performance, Barnes can now play the drums in a way not humanly possible, thus becoming a *bionic musician* (FREETHINK, 2018). Victoria Modesta – a model, singer, and performance artist – started a new identity as a bionic pop artist. She proposes a new way of thinking and perceiving disability and altered beauty (LANT, 2017), where prosthetic technologies are not perceived as something to hide, or something separated, but instead something to design as cool and glamorous augmentations. Are we continuing Hayles' nightmare? Not if you consider that these are tools reinforcing identities. Instead of being ashamed or embarrassed, technology could help transform not only the everyday reality but also the perception of the self, and push even more questions on what else could be done to explore new bodily configurations, as said by Angel Giuffria in an interview for *The Guardian*: *What if I don't want a hand, what if I want a tentacle?* (2018, 0:21). The preparation for this shift partially comes from science. In 1998, cybernetic professor and biomedical engineer Kevin Warwick famously installed a microchip into his forearm that connected him to the internet, allowing him to control electronic objects, and thus explore a dimension of *the other*. Part of this comes from art. Stelarc, in the *Third hand* project, added a prosthetic mechanical hand to his own biological body: a third limb independently controlled by nerve impulses from surface electrodes

attached to his body. We can re-design the body for other ways to act in the world, beyond our regular experience. Enhancement therefore not only allows us to be faster or stronger but also lets us do something we were not able to do before. Design and art, besides fiction, are ideal contexts where to explore also extreme scenarios of transformation for the distant future. Michael Burton and Michiko Nitta developed an energy-related post-human scenario, with the project *The Algaculture*. Inspired by research on photosynthetic creatures conducted by Debora MacKenzie and Michael Le Page (2010), the Human body is enhanced with algae living – and serving as an alternative fuel – inside new prosthetic organs. The cyborg here becomes again an occasion for challenging anthropocentrism and human exceptionalism and emphasizes our co-dependency with nonhuman life, producing new corporeal entanglements and mutual cooperation to reinvent ourselves on an interconnected changing planet.

Again, fiction goes far, reality makes one step at a time, but both are important in this feedback loop to construct our human condition. We start to see products in the market for body augmentations like NeuroSky's prosthetic toy limbs: the Necomimi cat ear set. It is a headset of mechanized ears using EEG sensors to let the ear react according to the brain activity, extending emotional expressivity. If you are focused, the ears tend to perk up and move fast; and when you are relaxed, the ears droop. Devices like this are still a niche gadget, not adopted on a massive scale to have a direct impact on society, but what if we can easily wear something like this every day to enhance our body language? How would this change social interactions? We are experiencing these changes faster and faster. In the early 2000s the idea of *sousveillance* (MANN et al., 2002) was introduced: a reverse-Big Brother where ordinary people would use wearable cameras and other technologies to keep watch on companies and governments. Examples include citizens recording police brutality and sending the footage to news media. We do not wear cameras yet, but if you think about it, this is the reality of our days, thanks to our smartphones and the network connecting them. Considering contemporary industrialized cultures, the integration of technologies is not only common but necessary for everyday life. Our bodies must work in harmony with machines, hardware, and software that, in one way or another, become a part of us.

The leaps that fiction allow, the distance between us now and in the future, carry the questions about what we are going to lose in the process, in this distant journey. With fiction we design possible futures and question our condition and our relationship with technology and our ability to modify ourselves. This relationship has been explored with an interesting twist in Paul Verhoeven's *RoboCop* (1987) and its remake by José Padilha (2014). It is the story of a Detroit policeman who is badly injured and subsequently given an almost entirely prosthetic body. The organic/natural part is limited to the human face, the brain, and the spinal cord of his central nervous system. In Padilha's version he also has the lungs and a hand. This extreme condition forces us to ask ourselves if RoboCop is still human after this heavy transformation, proposing again the Frankensteinian ab-human concept. In addition it seems that the human-technology relationship is inverted: the human part is more a prosthesis of the robotic body rather than the opposite. Without the human part, technology risks of being subject to tremendous mistakes, like when the ED-209 malfunctions and kills one of the OCP managers. As they differentiate the human identity from the post-human, the films engage with questions of how the biological and technological characteristics of the protagonist impact his detective skills, crime-fighting, and masculine gender performance (MARSELLUS, 2017). In Verhoeven's movie, the transformation of Murphy into RoboCop consists in losing his physical self, his memory, and mental faculties, but also his entire human identity as Alex Murphy (*ibid.*). In short, in the words of Bob Morton, junior executive of OCP, "he doesn't have a name, he's got a program, he's a product". This new body is sculpted like a hyper-muscular human body with large pectorals, well-defined abdominals (*ibid.*), and defined shoulders. He is basically a robot with a human face, his movements are extremely precise but mechanical and slow, you feel the time to process the action, and it is something that as a spectator you see through his visor that shows the linear logic of the actions and their computations. These traits make him very efficient as a crime fighter, but he completely lost his detective skills: he is shown patrolling and stopping when and where the dispatcher tells him to go. In Verhoeven's critique of the post-human, "To eliminate weakness and become a perfect hyper-masculine fighting machine, one has to actually become a hyper-masculine machine, sacrificing talent in detecting crimes for an indestructible power in

fighting them" (*ibid.*). This changes when the humanity of Murphy emerges in the form of dreams and memories of his family. This acts as a trigger for a behavioral transformation, from the fighting machine that executes commands, to a human-driven detective that begins investigating his past. His body makes it able to efficiently fight crime and his human mind is effective in detecting criminals, but he is fully hampered by the systemic corruption embedded in his programming (TELOTTE, 1991, p. 17) – which, for example, prevents him to harm OCP employees. Padilha's version tackles the transformation of Murphy into RoboCop from another perspective. The technology comes from neurorobotic prosthetics designed for injured people, and they make it clear from the beginning what they think makes a human: "You are not you because of your legs, your arms, your hand. It is your brain capacity to process information that makes [you] who you are" says Dr. Dennett Norton to a patient that is testing his new robotic arms for the first time. We are adaptive beings, because our brain has the capacity to adapt constantly to different conditions, and its plasticity gives us the capacity to embed technology in an extended sense of the self. Murphy, as we said, wakes up in a condition where the prosthetic part of his body is dominant, leaving just a few organic parts from his human condition. What he thinks at the beginning is a suit is, instead, his new prosthetic body. This new reality is understandably shocking for him and difficult to handle psychologically. We know he is supposed to be a fighting machine, but the human, mental control makes him less efficient in combat scenarios, so to improve his performance, they computerize his brain so that any sensation of danger triggers the computer to take over his actions, giving him an illusion of free will. It is not a man in or extended by a machine, but as the OmniCorp executives say, "it's a machine that thinks it's Alex Murphy". The human part has the ability to construct sense, but it's limiting the efficiency of the execution. When the visor comes down, he is indeed transformed into a fully automated and emotionless drone. Padilha's RoboCop is a cyborg in the age of information networks (SUDLOW, 2015). He has an extended perception, where the city itself becomes an extension of his body, an additional sensorial apparatus, a prosthesis of the prosthesis, with a corporeality of another scale, that again, like in the previous and other movies, is visualized as a visualization of augmented reality would. The reality that you perceive in that specific time and space

is just one of many. The speed of connectivity that his new body offers allows him to access police records, CCTV databases, and live feeds, to shape his tactical and strategic actions. RoboCop sets lists of criminal targets and completes his goals with extreme efficiency; you have the feeling of facing an infallible machine representing the infallibility of automation and advanced surveillance. Thus, in this version of the movie, the detective skills are multiplied by a cognitive enhancement. In Padilah's *RoboCop*, the human component can even reverse the changes made to his neurotransmitters, making the coexistence of the human and robot elements harmonious and pushing him to overcome the programming that should have prevented him to harm the OmniCorp CEO. The alteration made to control his behaviors allows him to bypass his robotic restrictions. The combination of technology and humanity are the elements to reclaim his autonomous cyborg identity (MARSELLUS, 2017). The cynical satire of Verhoeven where "no mix of humanity, masculinity, and technology result effective crime-fighting" (*ibid*.) is different from Padilha's optimistic humanism where technology is effective, is a positive force, and corruption is outside his body, outside technology, because the human part is in control.

Literary texts are not, of course, merely passive conduits. They actively shape what the technologies mean and what the scientific theories signify in cultural contexts. They also embody assumptions like those that permeated the scientific theories at critical points. These assumptions included the idea that stability is a desirable social goal, that human beings and human social organizations are self-organizing structures, and that form is more essential than matter. (HAYLES, 1999, p. 21)

In a world going towards automated and interconnected technologies, we are probably not interested anymore in what we can lose in the transformation, but instead, what we can give to the technological apparatus to make it more human.

Notes

[1] Inspired by the book title: Radkau J. (1998). *Das Zeitalter der Nervosität: Deutschland zwischen Bismarck und Hitler*. Hanser.
[2] The widespread character of the muscular hero (from Steve Reeves to Arnold Schwarzenegger) featured in more and more cinema successes from the 1930s on.
[3] Marvel's Spiderman and DC Comics' Catwoman.

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