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Aneta Jałocha

**(Re)De-
signing
Human
*Genetics in Cinema.
The Dialectics of Past,
Present and Future***

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The Technology of the Days to Come

In 1899, at the dawn of a new century, Jacques Loeb, after conducting a research on the process of parthenogenesis in sea organisms, argued that the results of his scientific exploration may become a foundation of a “technology of living substance” (Bud, 1991: 421). Eight years later, the term “biotechnology”, a science to emerge in the future, was coined by a Hungarian engineer and farmer, Karl Ereky; it became rapidly adapted and included in the titles of scientific publications in Germany, England and the United States. Though in the first half of the 20th century the meanings of the term were shifting, certain elements of various definitions seem recurrent: biotechnology as a merger between science and technology; or more specifically, a combination of biology (acquisition of knowledge about living organisms, a discipline of natural sciences, which at the beginning of the 20th century was under a strong influence of the concept of “progressive evolution”) and engineering (practical application). Ereky’s idea was claimed to be “the signature of the era” (Bud, 1991: 424), which echoes the titles of contemporary publications, such as *Biotech Century: Harnessing the Gene and Remaking the World* (by Jeremy Rifkin).

Since the fifties, the term “biotechnology” began to stabilize and became associated mostly with genetics and molecular biology. In 1953, James Watson and Francis Crick solved one of genetic puzzles: the structure of the DNA (first extracted in 1869 by Johann Miescher, who named it “the nuclein”), identifying it as a double helix. The march of biotechnological discoveries sped up rapidly. Watson and Crick’s findings, followed by the development of DNA sequencing techniques, gene splicing and recombination, as well as the advances in RNA research marked a new stage in biotechnology: an “era of genetics”, the exploration of “the mechanism by which life comes from life”, in Crick’s terms” (Crick, 1953). The rapid pace continues, as genetics still holds hopes for our future. In 1997, a piece of shocking scientific news broke out: a team of American researchers successfully cloned the first mammal from a cell which was removed from an adult individual. Dolly the Sheep, just as the DNA double helix, has gained the status of a “genetic celebrity” and was featured on various press covers. Ten years later, the world commemorated the anniversary of her birthday as the tremendous triumph of biotech science. Similarly, when the final stage of the Human Genome Project was declared as completed in 2003, it was a breakthrough event for both science and culture. Step by step, since the milestone discovery of DNA’s structure, biotechnology started to permeate different fields, leaving sterile laboratories and the territories of science to become an essential element of present-day politics, economics and culture.

Aneta Jałocha is a PhD candidate at the Institute of Audiovisual Arts, Jagiellonian University; her research interests include history of French cinema and avant-garde films. Since 2012, she has taken part in SET (Society, Environment, Technology) Interdisciplinary Studies program.

The Omnipresent DNA

As Nelkin and Linde have pointed out, the “gene” is a “molecular mirror” of the twenty first century (Nelkin and Linde, 2004: xi). DNA is omnipresent in a double sense: biologically, as all living organisms contain DNA, but also culturally, as the “molecule of life” infiltrates everyday experience: articles on genetics are frequently published by popular scientific magazines; e-bay offers various DNA-inspired accessories, ranging from a double helix keychains

to “Fightings in my DNA” t-shirts; television drama series begin to feature genetic testing (*Grey’s Anatomy*) or forensic biotechnology (CSI). Over and above, biotechnology is still an emerging branch of science and its driving force comes from the collision of “what is now” and “what may be”; a rupture inscribed in the ethos of development. As genetics is solving the “riddles of life”, one by one, it generates new brain-teasers in explaining the mechanisms of biological processes; but it also blurs the boundaries between nature and technology, calling into question the notion of “humaneness”. As Jeremy Rifkin noted: “The problem is that biotechnology has a distinct beginning, but no clear end” (Rifkin). Currently, we are facing another biotechnological “turn”: the costs of genetic testing and certain procedures of cloning (some are banned by government regulations) decrease, making the biotechnological market expand rapidly, and further growth is forecast for the coming years. Between 2004 and 2006, a private company Genetic Savings and Clone, Inc. provided the service of cat cloning; their website gallery was filled with persuasive images of cat-donors and their genetic replicas. Since 2013, another company, 23andMe, offers genetic testing for a 99\$ fee, giving “information and tools for individuals to learn about and explore their DNA” (23andMe). Biotechnology is in use, which means that it might be also abused. With every next level of genetics “evolution”, new hopes and threats arise, heating up debates on social and technological roles of genetics and its ethical aspects. Amidst the ongoing war over genetics, public attitudes towards “technology of the future”, still highly antagonizing, are of a special concern; mapped, analyzed and presented in subsequent publications.

Predicting the Future, Recalling the Past

Public understanding of genetics is largely shaped by mass media; the key strategy in introducing and explaining biotechnological discoveries to the public is based on incorporating metaphors that through the process of juxtaposing familiar and unfamiliar contexts allow to transfer and organize knowledge (Christidou, Dimopoulos, Koulaidis, 2004: 348). In addition, initiatives and campaigns aiming to increase scientific literacy tame social fears and minimize the communication gap, as the scientific discourses enter into the public. One may use the website run by the Tech Museum of Information to pose a series of questions to a scientific specialist about genetic engineering, play a “DNA Roulette” and discover, step by step, how to extract DNA from a strawberry; or take part in one of the summer schools devoted to biotechnology and its implications. Still, people’s attitudes and opinion with respect to genetic engineering depend on several different, often contradictory, representations of genetic technology in popular culture, which should not be overlooked. Research conducted in Australia has shown that film stands are an influential source of information on cloning (Cormick, 2006: 182). Linda Hamilton adds that most people will not read reports about the state of biotechnological research; rather, they will watch a film or read a novel on genetic ventures (Hamilton, 2003: 268–269).

Within the universe of popular culture, science-fiction is an abundant reservoir of ‘imagination’ (the term was introduced by José van Dijk in *Imagination: Popular Images of Genetics*). When the possibility of engineering

the human left the realm of mythology (i.e. Pygmalion and Galatea) and became a potential accomplishment of scientific development, artificial humans, mutants and clones filled the pages of comics (*X-Men*, *Captain America*, *Spiderman*, *Hulk*, *Teenage Mutant Ninja Turtles*, *The Trilogy of Nikopol*), novels (*Brave New World*, *Dune*, *The Cloud Atlas*, *The Island of doctor Moreau*); genetics became also an often explored theme within television series (*Dark Angel*, *Beauty and the Beast*, *Mutant X*) and cinematic productions, often derivative as based on earlier science fiction novels or comics (*Blade Runner*, *The Boys from Brazil*, *Never Let me Go*, the *X-Men* series). The roles assigned to science-fiction characters vary: they are villains, heroes or victims of genetic manipulation. The impact of the biotechnological revolution is immense: genetic themes feature in stories so far monopolized by folklore and myths; theme once belonging to the sphere of irrationality began to be *explained by the "genetics dictionary"*. In the age of biotech, even the vampires are in jeopardy, just to mention *Blade* (1998, dir. Stephen Norrington), whose main character's DNA is modified (a hybrid of a human and a vampire), or genetic experiments of mad scientists in the fourth season of CW's supernatural teenage drama series *The Vampire Diaries* (broadcast in 2013/2014).

In this article I am going to analyze how chosen films, produced in various periods (between the creation of Dolly the Sheep, the Human Genome Project and the rush of reports about the advent in human cloning), such as: *GATTACA* (1997, dir. Andrew Niccol), *The Island* (2005, dir. Michael Bay) and *Never Let me Go* (2010, dir. Mark Romanek) negotiate the meanings of biotechnology. They explore different areas of genetic engineering, address important issues resulting from the rapid biotechnology development and expansion. Although not apparent at a first glance, biotechnology and science-fiction share similar traits: "Biotechnology takes on some of the sense of wonder of science-fiction. It is anchored in a present that is the visionary future of an ahistorical imagination. To know the future, we must combine science with imagination" (Hamilton, 2003: 273). Science fiction, just as the researches designing biotechnological development and its role for the future generations, creates its contemporary foresights into the future, "what may be" immersed in "what is now", but often looking back to "what has already been".

Pimp Up my Genes

Four months after the event publicized in television news, scientific and popular magazines, the birth of Dolly the Sheep, *GATTACA* premiered. However, before being officially released in the theatres, a closed screening for biotechnologists had been organized. Some of them attended to watch the sci-fi folklore and babeldom. Others, which points to the scientists' awareness of the importance of local knowledge on genetics and the public's role as a participant in the biotech war, stressed that *GATTACA* is "a film that all geneticists should see if for no other reason than to understand the perception of [their] trade held by so many of the public-at-large" (Kirby, 2000: 208–209). Soon after the premiere, the term *GATTACA*, made of letters coding' biological compounds of DNA (adenine, thymine, guanine and cytosine) became commonly used as a handy expression, a one-word metaphor connoting a "geneticized" future. But what is the future that *GATTACA* forecasts and what are the main threats deployed in the film? The world presented in *GATTACA* is one of genetic purity fixated on perfection: interiors made of glass and shiny metals are inhabited by

humans designed on-demand to meet the standards of flawlessness, and this accurately arranged world leaves no room for uniqueness. Crucially, Niccol's film pictures "the days of future past" (to echo the title of a new segment of the *X-Men* series), as it predicts "what may" be by recalling "what has already been", i.e. inexplicitly referring to the dark legacy of eugenics; a legacy that still affects the public approach towards genetic engineering and is often used as an argument against the use of biotechnological manipulations.

The peak of eugenics' popularity overlapped in time with the emergence of the concept of biotechnology. In the early 20th century Rudolf Goldscheid, founder of an Austrian social biology department, emphasized the need to develop a technology suitable for the modification of people; similar ideas were promulgated in Great Britain by Rainald Brightman (Bud, 1991: 426–430). Moreover, the eugenics program to design humans according to a set of chosen norms was not only a future scenario; certain strategies of improving and controlling human population, based on the available knowledge of heredity, were implemented. In the United States, in the first three decades of the 20th century, several states introduced compulsory eugenic policies, including a sterilization legally imposed on citizens regarded to be carriers of undesirable traits, such as mental disorders. For researchers associated with the eugenics movement, a new-to-become technology (engineering nature), was seen as a tool by which it would be possible to change the trajectory of evolution in the name of "efficiency" and modern progress.

In *GATTACA*, produced at the heart of the biotech revolution, similar aims (enhancing humans) sanction the rules of life within a fictional society. The story creates an image of "new eugenics" (Kirby, 2000), based on the easy, but status-dependent, access to commercialized biotechnological services. The society in *GATTACA* is divided into a sub-class of ordinary humans, called "God children", not lucky enough to have their genes "boosted", and a ruling class of people with (re)designed genomes. The first one is represented by Vincent, the film's main protagonist, conceived without the intervention of genetic engineering; Eugene, Anton (Vincent's younger brother) and Irene belong to the latter, privileged group. Niccol's film draws attention to one of the prevailing concerns of the debates: genetic engineering inventing a new form of social exclusion, dependent not on race, sex or ethnicity, but on genetic differences:

Ethicists and government commissions have expressed unanimous opposition to enhancement engineering, arguing that it carries huge social risk for abuse of power, discrimination and inequality. The line between clinical therapy and eugenic enhancement is fuzzy ...
(Sateesh, 2008: 117–118).

The technology of controlled reproduction used in the *GATTACA* world, however ambiguously explained, might be considered a futuristic fusion of germ-line therapy (gene transfer, modifying gene expression also in fertilized eggs, which at the time of the movie's production was already in the stage of clinical trials) and the PGD procedure (Preimplantation Genetic Diagnosis), used in *in vitro* fertilization to determine possible disorders in the embryo's genome. In *GATTACA*, for a sum of money, parents may design the genome of their child, project their future, and arrange the "book of life": not only to eliminate diseases, but also "potentially prejudicial conditions" (premature baldness, alcoholism, tendency to violence) and plan the color of their babies'

eyes, their musical talents, height or intelligence. When Antonio and Marie Freeman, after deciding on another baby, wonder, whether they should leave “a few things to a chance”, the geneticist replies: “You want to give your child the best possible start. Believe me, we have enough imperfection built in already. Your child doesn’t need any additional burdens”. *GATTACA* presents a social order in which enhanced people are predestined for greatness, while the ordinary, “in-valids” are on a road to nowhere.

Vincent is perceived through his genome; in short, his identity is equaled to his genetic material, which within the fictionalized *GATTACA* society assumes the role of a point of reference for making decisions about employment or choosing a proper life partner. Vincent’s future has been already planned: his fate is inscribed in his imperfect genome. The minute he is born, he is “diagnosed” to live no longer than thirty years, and his odds will be as follows: 42% chance of manic depression occurrence, and 99% of heart disease. “Ten fingers, ten toes” – comments Vincent (voice-over in retrospect) – “That is all that used to matter. Not now ...”. Niccol’s film questions genetic determinism, an ideology that operates with a “scientificized” rhetoric. Nelkin and Linde, analyzing socio-cultural representations of DNA, wrote:\

In super market tabloids and soap operas, in television sitcoms and talks shows, in women’s magazines and parenting advice books, genes appear to explain obesity, criminality, shyness, directional ability, intelligence, political leanings and preferred style of dressing. There are selfish genes, pleasure-seeking genes, violence genes, celebrity genes, gay genes Genetic determinism reduces the self to a molecular entity, equating human beings, in all their social, historical and moral complexity, with their genes’.

(Nelkin and Linde, 2004: 2)

Vincent dreams to fulfill his ambitions, which exceed the limits set out by his genome; this requires him, a worker for the spaceflight company Gattaca, to mask his genetic identity. He impersonates Eugene Jerome, a paralyzed former sportsman with “pimped up” genes, and transforms his body to eliminate biological traces and defects which would expose him as an “in-valid”. In *GATTACA*, the body, which contains genetic material and manifests it in information translated into flesh, becomes Vincent’s enemy. He repeats the make-over procedure: every day, he shaves and scrubs himself meticulously and wears contact lenses to hide his vision defect. “Daily, I disposed of as much loose skin, fingernails and hair as possible to limit how much of my in-valid self I would leave in the valid world”, Vincent explains. He uses Eugene’s bodily samples as his own to deceive tests, intensified due to a murder committed in Gattaca. The masquerade performed by the protagonist is of a biometrical kind, since it always occurs within his corporeality; the body, as the source of information and power stratifying *GATTACA* society, is being both hidden and exposed: blood, hair, urine. Withal, the notion of the self in *GATTACA* is ambiguous, enclosed in the verses of Ruth Stone’s poem *The Illusion*: “I am the genes and the genes are not me/ We are identical twins separated at birth ... / I am not me. I am the genes/ The double helix

Vincent understands the rules of the game he is playing, and he plays it, because he believes himself to be more than his genome predicts him to be;

but besides Vincent there are also other characters in *GATTACA* that discredit the ideology of genetic determinism. For example Eugene, designed to become a swimming champion, failed to be victorious; he has never been able to match the requirements and demands imposed on him by his impeccable genome (Kirby, 2000: 203–204) and decided to commit suicide, which is the truth, confessed to Vincent, about the car accident that got him paralyzed. The theme echoes Jürgen Habermas's argument that genetic manipulation may influence one's identity and the right to choose from a set of possible trajectories of life:

We cannot rule out that knowledge of one's own hereditary features as programmed may prove to restrict the choice of an individual's life, and to undermine the essentially symmetrical relations between equal and free human beings.
(Habermas, 2003: 23)

Anton, working as a detective on the murder case in *Gattaca*, sees himself better than the “in-valid” brother, but his self-image collapses with him losing the final swimming competition to Vincent (a game they used to play as children). What is more, he is saved from drowning by his genetically inferior brother. Shocked by Vincent's brilliant swimming abilities, Anton shouts: “How are you doing this? How have you done any of this?” Though Vincent provides a vague explanation, the real answer to the question is not provided, for it is hidden in the mystery of the human being, the film narrative suggests. The mystery cannot be explained with an alphabet limited to four letters: A,T,C,G which is one of the arguments of the “bioconservatist” camp.

The original ending of *GATTACA* involves a consideration of the future, stressing the need to reconsider ethical issues surrounding genetic engineering: “In few short years, scientists will have completed the Human Genome Project ... We have now evolved to a point where we can direct our own evolution ...”. Seventeen years have passed since the premiere of Niccol's film; ten – since the termination of Human Genome Project, and issues raised in *GATTACA* are currently of highest importance. In 2008, James Watson was one of two first people to reveal the results of his genome sequencing to the public (he did not publish the parts of his genome linked to the likelihood of Alzheimer's disease, as he himself did not want to learn it). Personal genomics are now becoming everyday reality: in its commercial offer: company called Gentle provides screenings of genetic conditions and its marketing slogan is: “Get in touch with Your DNA”. And there are many others rapidly expanding firms on the biotech market.

Availability of technologies necessitates serious questions, for instance, about how the collected genomic data will be stored and protected, or who will have an access to it, and under what circumstances. In the United States the famous Gina Act has been already introduced (2008) with the purpose of restricting the use of genetic information (biased to sectors of employment and health insurances), thus reducing the threat of genetic discrimination. Moreover, the advent of germ-line therapy is impending and PCD is beginning to be used: in 2000, the first “designer baby” was born (The baby was conceived through in vitro fertilization. Before implantation, embryos were screened to find the one with cells matching those needed to cure a girl with a genetic disease). Is *GATTACA*, to paraphrase the title of Ferris Jabr's article, going to become reality? As a survey conducted in the United States

shows, the public tends to accept introducing RGTs (Reproductive Genetic Technologies) for medical purposes, while they do not agree with using its use for “cosmetic enhancement” of individuals (Kalfoglou and others, 2005: 1612–1613). So does Niccol’s film: it neither fully rejects the biotech tools, nor embraces the technology of the future. *GATTACA* is also a film that brings out the dynamics of pop culture, which both upholds genetic determinism (examples enumerated by Nelkin and Linde) as well as contests it.

Human and its Other

In *Our Posthuman Future. Consequences of Biotech Revolution*, Francis Fukuyama argued that:

Many [biotechnologist] would assert that they are simply seeking remedies for certain genetically linked diseases ... that there are immense obstacles to human cloning and genetic enhancement, and that the modification of human nature is the stuff of science fiction, not technological possibility
(Fukuyama, 2002: 19)

Additionally, Fukuyama pointed out economical dimensions of biotech research, emphasizing that the costs of cloning are actually relatively lower than those of genetic enhancement technologies and that the ethical issues are the ones significantly affecting the research in that sub-field of biotech engineering. In 2004, two years after the publication of Fukuyama’s influential and much disputed book, Korean researchers have claimed to successfully use the human cloning technique (the results of the research were published in *Science* and later discredited). Though the news turned out to be scientific babeldom, it was a media blast, boosting the public fear. As Jaylan Turkkan noted, the fear of creating a perfect copy of an individual human being is deeply rooted culturally; cloning technology actualizes the old trope of doppelganger who may turn out to be either one’s perfect twin, or an anti-thesis (qtd. in DellaContrada, 2003). Secondly, the public is afraid of creating a “Brave New World”, where human clones would be used instrumentally. Both themes resurface in popular culture; the former was explored in a science-fiction film *The Sixth Day*, and the latter in the Hollywood blockbuster *The Island*, as well as the British-American co-production *Never Let Me Go*. Below, I will focus on *The Island* and *Never Let Me Go* as popular illustrations of current debates on human cloning.

The two films are connected by a common image of future/past future, where human cloning is in common use (or commonly abused). Clones are deprived of their humanness by those in charge (the society in *Never Let Me Go*, and private company owners in *The Island*) and treated either as organ-donors, prolonging the longevity of the chosen ones and making the dream of immortality come partially true, or as genetically-matching surrogate mothers on-order used to retain the client’s “sacred” body untouched. In these dystopian imaginations, genetic engineering manufactures non-humans (I will refer to clones as non-humans, my term following Giorgio Agamben’s distinction between human, non-human and nonhuman); life and body are turned into product/service in the workflow of exchange and consumption – both are

produced in a factory-like process, conserved or annihilated as their value is graded (human stands above the non-human). One scene in Michael Bay's *Island* presents a clone-surrogate giving birth to a child, and in a moment, as she is dreaming of a bright future with her baby, she is classified as "used up" and killed by the company workers.

As soon as they enter maturity, main characters of *Never Let Me Go* begin to donate their organs to humans in need, awaiting their so-called completion (death by exhaustion of the body divested from organs). Clones are thrown into a space where they are bred by the Controllers into separate castes of Alphas, Betas, Epsilons, and Gammas, to paraphrase Fukuyama's comment on *The Brave New World* (Fukuyama, 2002: 6). Their quality and importance is determined only in terms of utility; they are the invisible ones. The notion of anonymousness of the non-humans is highlighted by the fact that in each of the films clones have a special naming convention, because the act of naming belongs to the order of cultural self-identification, "it as an act of abstraction, of providing a name for a complex set of ideas, histories, associations and needs" (Hegeman, 2012: 115). In *The Island*, the main characters are referred as Jordan-Two-Delta and Lincoln-Six-Echo. The naming code or convention used by the cloning company becomes apparent as the film unfolds: the first element indicates their owner, or the person whose genetic replicas they are, the other element indicates their location. The clones naming convention automatically turns them into products, as copies lacking personality and uniqueness. Daily, the clones use the same white clothes, repeat similar activities, and follow the code of behavior enforced by the guardians, so the company corridors are peopled with hundreds of clones dressed in identical uniforms. Likewise, in *Never Let Me Go*, non-humans bear only the forename: Ruth, Tommy. The narrator, a 28-year-old clone, presents herself in the opening sequence of the film: "My name is Kathy H.," accepting the role that was designed for her: non-human/the organ donor. Clones in *The Island* and *Never Let Me Go* are not given surnames by the Controllers, to underscore their artificiality, inhumanity, a lack of the past, or a family tree, and to detach them from what is granted with humanness. They originate from the closed spaces of genetic laboratories.

Yet, the clones feel, dream, learn, love, and their curiosity cannot be eliminated: Jordan-Two-Delta and Lincoln-Six-Echo spectacularly escape from the cloning company and search for their "owners"; in *Never Let Me Go*, one of the dreams shared by Ruth, Tommy and Kathy is to come across the "originals", humans who have the same genetic arrangement as they do. When Ruth hears from her friend that someone saw her "matching" human, she decides to take a trip and see the woman. She is devastated when she discovers that it was a mistake while lurking through a windshield, which stands for the borderline between the world of humans and non-humans. Later on, she says to Kathy: "It was never gonna be her. They never, ever model us on people like that woman We are modeled on trash". Like the ones listed by Ruth, "junkies, prostitutes, winos, tramps and convicts", figures of exclusion, the clones live on the peripheries of society, stigmatized as the Others (even their names other than clones).

The human-clone divide is intensified by space organization in both films. The fictional company in *The Island* is located underground, separated from the human space. Behind the glass, the clones see only a high-tech hologram – the Controllers claim that the outside world was contaminated and tantalize the clones with a vision of a mysterious island, the only non-polluted area,

where the lucky lottery winners will be transported. The humans are also forbidden to enter the company underground zones and meet with their genetic doppelgangers; clients are assured that clones are in a vegetative state. To keep the business spinning, the construct of the “clone as product/service” must be closed-off. The main characters of *Never Let Me Go* are brought up in an isolated school, Hailsham, and then moved to farm called The Cottages, and at every stage of development prepared for their “mission” as donors. They never interfere with humans and, analogically, humans, except those responsible for clones’ “upbringing”, do not seek contact with the clones. The clones status, distinct from humans, justifies the (ab)use of genetic engineering within the fictional worlds. Miss Emily, when questioned by Tommy and Kathy as to why they were made to draw images in Hailsham, responds: “We didn’t have The Gallery in order to look into your souls. We wanted to know if You have souls”; while in *The Island*, the director of the cloning company says: “It’s a product, ladies and gentlemen ... in every way that matters. Not human”. Hence, the clones are treated as “biofacts”, man-made biological entities, being subject to experiments, patents and ownership disputes (Anker, 2009: 230).

There are also significant differences between the two films. Firstly, *The Island* is set in the future, where contemporary elements (Nike trainers; a pub visited by Lincoln and Jordan at the beginning of their runaway) are intermixed with futuristic ones (interiors of the cloning company; high-tech devices used by characters. Most of those technologies, for instance device mapping the dreaming process or toilets testing health conditions, although not as developed as they are in the film, are available or the first prototypes have been already publicly presented.) Thus, typically for science-fiction films, the future is mediated by the present. On the other hand, the events presented in *Never Let Me Go* take place in late 70s and 80s of the 20th century, during the period of rapid advance in genetic engineering. Characters listen to songs from antiquated tape-recorders and the only visibly manipulated aspect of reality in the film is the availability of human cloning technology. The possible future consequences of biotech engineering are shown through a fictionalized past, creating a “past-future” vision. The removal of a standard sci-fi entourage raises the probability of presented events, making them more disturbing. *The Island* also employs the tactics of bombarding the viewers with special effects and shocking scenes: the scene of “birth” of a mature clone from an artificial water-filled womb, or another one, in which the clone wakes up, while his organs are extracted and escapes from the operation room. *Never Let Me Go* is nostalgic, centering on emotions and motivations of the main characters; the slow, premature and painful degradation of the clones’ bodies is far from a Hollywood spectacle. Finally, when *The Island*’s Jordan and Lincoln learn that they are clones surrounded by a “grand-illusion”, they fight; whereas Ruth, Kathy and Tommy, as a result of the ideology that they were nourished with since childhood, see themselves as organ-donors, brought to life only to be “harvested”: “I feel a great sense of pride in what we do”, says Kathy, “Carriers and donors have achieved so much”.

The Island and *Never Let Me Go* were produced after the rumor of human cloning research leaked out, in a period of intensive work on laws regulating the genetic engineering in the United States and Great Britain. Moreover, *Never Let Me Go* was based on Kazuo Ishiguro dystopian novel, published in 2005, when reports of successful human cloning in the UK were made. Currently, legal regulations of cloning technology and research vary from country to country. In some, there are distinct regulations for therapy cloning and for

reproductive cloning. Since 2004 and 2005, new information on the stage of research in cloning technology has been made known: two American researches succeeded in creating human embryos from cells taken from an adult human. As Fukuyama claims, the race of genetic engineering is unstoppable: "today and in the very near future, we face ethical choices about ... human cloning" (Fukuyama, 2002: 19). *The Island* and *Never Let Me Go* question the ethical dimensions of genetic engineering and potential consequences of the (ab)use of technology, caused by human ambitions. To quote Ishiguro's novel:

Suddenly there were all these new possibilities laid before us, all these ways to cure so many previously incurable conditions. This was what the world noticed the most, wanted the most But by the time people became concerned ... it was too late. There was no way to reverse the process.
(Ishiguro, 2009: 240)

In my article, I attempted to demonstrate how the science-fiction genre responds to discoveries in genetic engineering and creates images of the future, referring to "what is now", but sometimes also to "what has already been". Due to the limited scope of the text, selection had to be made from among many science-fiction films with a genetic theme, such those including hybrid species (for instance, *X-Men*). *GATTACA*, *The Island* and *Never Let Me Go* pose important questions about the limits of the purview in which genetic engineering, limited to cloning, genetic human enhancement and RGTs, can be used. Science-fiction films play a double socio-cultural role: they function as mirrors reflecting public hopes and fears linked to genetic engineering and based on the possessed local knowledge, but they also heavily influence the process of forming opinions and attitudes towards biotechnology. Like the metaphors used in popular magazines, their affect may be contradictory, either decreasing or amplifying the public fears. It is worth noting that sci-fi texts often distort scientific facts and demonize genetic engineering. On the other hand, they transcode into popular culture concerns emerging in government and academic debates (I am referring to the dispute between the so-called bioconservatives and transhumanists. The first group argues that genetic engineering may lead to dehumanization; the other stands in "defense of posthuman dignity", to borrow from the title of Nick Bostrom's article, and advocates for common access to biotech tools.) Whereas the nightmarish prophecies of the future, where the (ab)use of cloning is commonly accepted and humans are divided into genetically inferior and superior castes may seem exaggerated, issues such as stem cell research, germ-line therapy, genetic discrimination, theft of biometric identity or research involving human embryos are no longer "the stuff of science-fiction". The Biotech Age has already begun.

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